

# **NYRCR** **Towns of** **Fulton and** **Blenheim**

NY Rising Community  
Reconstruction Plan

**DECEMBER 2014**

**NY RISING  
COMMUNITY  
RECONSTRUCTION  
PROGRAM**



# Towns of Fulton and Blenheim NYRCR Planning Committee

Ralph Arrandale, Co-Chair

Linda Quinn, Co-Chair

Earl Allen

Neil Driscoll

Melissa Graham

Katherine Hawkins

Robert Mann

Phil Skowfoe, III

Robert Wilson



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The Consulting Team, led by Tetra Tech, Inc., included:

Susan G. Blickstein, AICP, PP, PhD

The Byne Group

Hudson Valley Planning and Preservation

The McKissak & McKissack Group, Inc.

Planning4Places, LLC

SCAPE / Landscape Architecture PLLC



**TETRA TECH**

*Cover image: The Towns of Fulton and Blenheim are replete with picturesque vistas. Photo is courtesy of Raymond Adams.*

# Foreword

## Introduction

In the span of approximately one year, beginning in August 2011, the State of New York experienced three extreme weather events. Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy wreaked havoc on the lives of New Yorkers and their communities. These tragic disasters signaled that New Yorkers are living in a new reality defined by rising sea levels and extreme weather events that will occur with increased frequency and power. They also signaled that we need to rebuild our communities in a way that will mitigate against future risks and build increased resilience.

To meet these pressing needs, Governor Andrew M. Cuomo led the charge to develop an innovative, community-driven planning program on a scale unprecedented and with resources unparalleled. The NY Rising Community Reconstruction (NYRCR) Program, within the Governor's Office of Storm Recovery (GOSR), empowers the State's most impacted communities with the technical expertise and funding resources needed to develop thorough and implementable reconstruction plans to build physically, socially, and economically resilient and sustainable communities.

## Program Overview

The NYRCR Program, announced by Governor Cuomo in April of 2013, is a more than \$700 million planning and implementation program established to provide rebuilding and resiliency assistance to communities severely damaged by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. Drawing on lessons learned from past recovery efforts, the NYRCR Program is a unique combination of bottom-up community participation and State-provided technical expertise. This powerful combination recognizes not only that community members are best positioned to assess the

needs and opportunities of the places where they live and work, but also that decisions are best made when they are grounded in rigorous analysis and informed by the latest innovative solutions.

Launched in the summer of 2013 and completed in March 2014, Round I of the NYRCR planning process included 50 NYRCR Planning Areas, comprising 102 storm-impacted localities. In January 2014, Governor Cuomo announced a second round of the planning process, serving an additional 22 storm-impacted localities. Four of these localities were absorbed into existing Round I NYRCR Planning Areas, bringing the number of localities participating in Round I up to 106; the other 18 localities formed 16 new Round II NYRCR Planning Areas. Between Rounds I and II, there are 66 NYRCR Planning Areas, comprising 124 localities. The program serves over 2.7 million New Yorkers and covers nearly 6,500 square miles, which is equivalent to 14% of the overall State population and 12% of the State's overall geography.

In Rounds I and II, the State allotted between \$3 million and \$25 million to each participating locality for the implementation of eligible projects identified in the NYRCR Plan. The funding for these projects is provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant—Disaster Recovery (CDBG-DR) program.<sup>1</sup>

Each NYRCR Planning Area is represented by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Members of the Planning Committees were identified in consultation with established local leaders, community organizations and, in some cases, municipalities. The NYRCR Program sets a new standard for community participation in recovery and resiliency planning, with community

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<sup>1</sup> Five of the Round I Planning Areas—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.

members leading the planning process. Across the State, more than 650 New Yorkers have represented their communities by serving on Planning Committees. Nearly 650 Planning Committee Meetings have been held, during which Planning Committee members worked with the State's team to develop community reconstruction plans, which identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 250+ Public Engagement Events attracted thousands of community members, who provided feedback on the planning process and resulting proposals. The NYRCR Program's outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the program's website ([www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)), providing several ways for community members and the public to submit feedback on the program and materials in progress.

Throughout the planning process, Planning Committees were supported by staff from GOSR, planners from New York State (NYS) Department of State and NYS Department of Transportation, and consultants from world-class planning firms that specialize in engineering, flood mitigation solutions, green infrastructure, and more.

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allotted over \$700 million for planning as well as implementing eligible projects identified in NYRCR Plans. NYRCR Planning Areas are also eligible for additional funds through the NY Rising to the Top Competition, which evaluates applications from Round II NYRCR Planning Committees across three categories—Regional Approach, Inclusion of Vulnerable Populations, and Use of Green Infrastructure. The winner of each category will be allotted a share of the competition's \$3.5 million to fund additional eligible projects.

In April 2014, Governor Cuomo announced that projects identified in NYRCR Plans would receive priority consideration through the State's Consolidated Funding Application (CFA) process and charged the Regional Economic Development Councils (REDCs), which play an advisory role in the CFA process, to support

NYRCR projects. In December 2014, Governor Cuomo announced that 24 NYRCR projects received nearly \$12 million in CFA funding. This announcement is an example of the Governor honoring his commitment to leverage the work of the NYRCR Planning Committees to incorporate resilience into other State programs and to find additional sources of funding for NYRCR projects. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and to create funding opportunities where none existed before.

The NYRCR Program has successfully coordinated with State and Federal agencies to help guide the development of feasible projects. The program has leveraged the REDC State Agency Review Teams (SARTs), composed of representatives from dozens of State agencies and authorities, for feedback on projects proposed.

## The NYRCR Plan

This NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Planning Committee began the planning process by defining the scope of its planning area, assessing storm damage, and identifying critical issues. Next, the Planning Committee inventoried critical assets in the community and assessed the assets' exposure to risk. On the basis of this work, the Planning Committee described recovery and resiliency needs and identified opportunities. The Planning Committee then developed a series of comprehensive reconstruction and resiliency strategies, and identified projects and implementation actions to help fulfill those strategies.

The projects and actions set forth in this NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the Planning Committee's prioritization of these projects and actions. Proposed Projects are projects proposed for funding through an NYRCR Planning Area's allotment of CDBG-DR funding. Featured Projects are projects and actions that the Planning Committee has identified as important



resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects. The Proposed Projects and Featured Projects found in this NYRCR Plan were voted for inclusion by voting members of the Planning Committee. Those voting members with conflicts of interest recused themselves from voting on any affected projects, as required by the NYRCR Ethics Handbook and Code of Conduct.

As part of Round II of the NYRCR Program, the Towns of Fulton and Blenheim have been allotted up to \$3 million each in CDBG-DR funds for the implementation of eligible projects identified in this plan.<sup>2</sup>

While developing projects for inclusion in NYRCR Plans, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. Projects and actions implemented with this source of Federal funding must satisfy a Federally-designated eligible activity category, fulfill a national objective (i.e., meeting an urgent need, removing slums and blight, or benefiting low- to moderate-income individuals), and have a tie to the natural disaster to which the funding is linked. These are among the factors that GOSR will consider, in consultation with local municipalities and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

The total cost of Proposed Projects in this NYRCR Plan exceeds the NYRCR Planning Area's CDBG-DR allotment to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in this

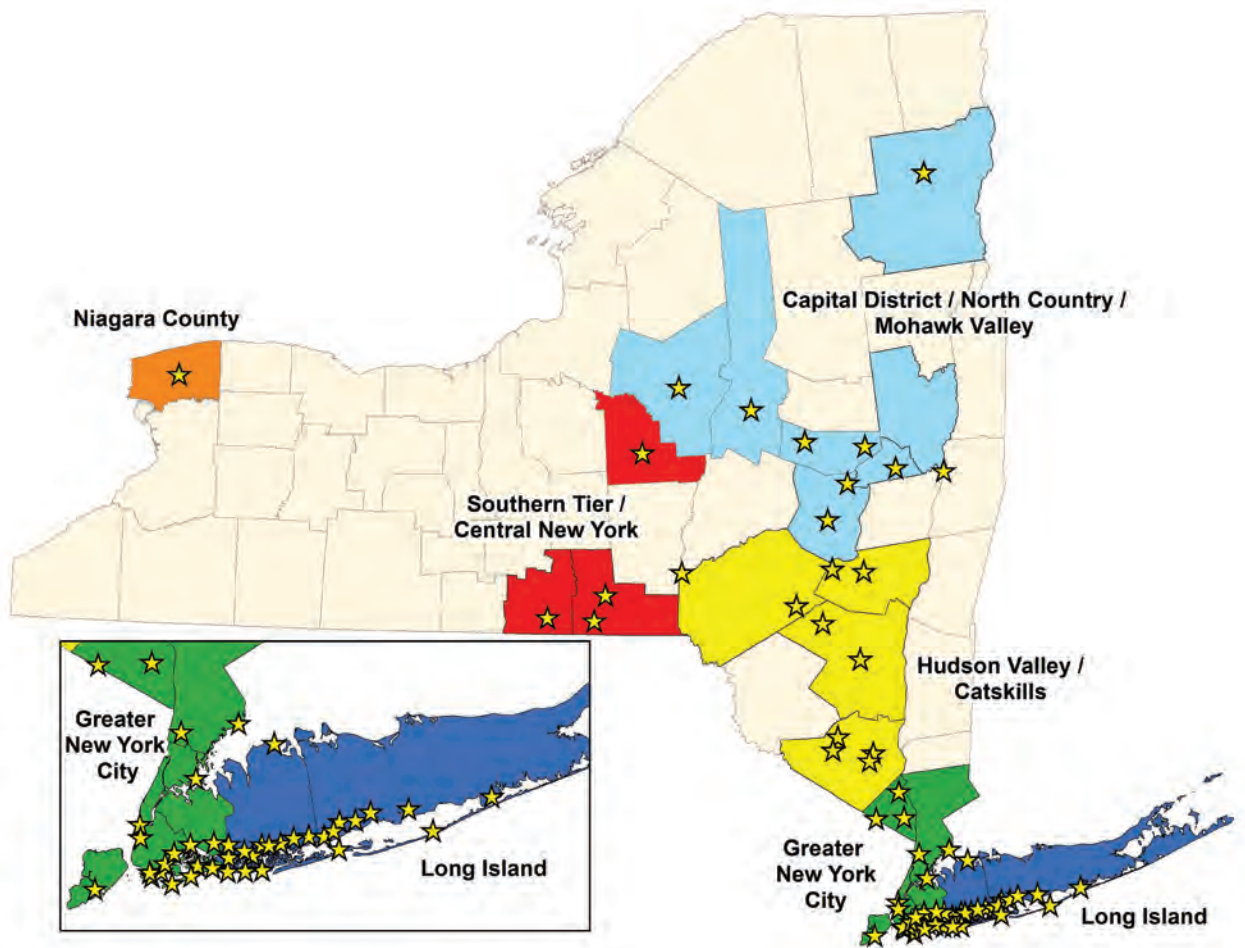
NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act. Inclusion of a project or action in this NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented. Projects will be implemented on a staggered timeline, and the NYRCR Program will choose an appropriate State or local partner to implement each project. GOSR will actively seek to match projects with additional funding sources, when possible.

In the months and years to follow, many of the projects and actions outlined in this NYRCR Plan will become a reality, helping New York not only to rebuild, but also to build back better.

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<sup>2</sup> The following localities' allotments compose the NYRCR Planning Area's total allotment: Town of Fulton - \$3 million; Town of Blenheim - \$3 million.

## NY Rising Communities



*Note: Map displays the 66 NYRCR Planning Areas from Rounds I and II. (Five of the Round I Planning Areas—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program. Find out more at: [www.stormrecovery.ny.gov/nycr](http://www.stormrecovery.ny.gov/nycr))*



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# Executive Summary

## Overview

**T**he Towns of Fulton and Blenheim (Towns) are small, rural communities surrounded by miles of forest, farmland, and significant recreational resources. The Towns are located in the Schoharie Valley, known for its natural beauty and long history as an agricultural powerhouse. The area was once known as “the Breadbasket of the American Revolution” during the Revolutionary War, due to its role in supplying grain to General George Washington and his army. Agriculture remains an important component of the Schoharie Valley’s economy.

On August 28, 2011, Hurricane Irene made landfall in New York. The Schoharie Creek rose more than 20 feet due to the flash flooding caused by unprecedented rainfall associated with the hurricane. Powerful winds and raging floodwaters caused extraordinary damage in the Towns of Fulton and Blenheim; power was knocked out, homes and businesses were flooded, infrastructure was destroyed, and residents’ access to safe shelter, food, clean water, and medical services was compromised.

The Towns were still in states of emergency when Tropical Storm Lee hit less than two weeks later. Tropical Storm Lee undermined recovery efforts made after Hurricane Irene and further strained emergency response operations.

Because extreme flooding affects all residents and businesses in the Towns, even those outside of the flood hazard area, the NY Rising Community Reconstruction Program (NYRCR) Towns of Fulton and Blenheim Planning Committee (Committee) identified the geographic scope (NYRCR Planning Area) of the Towns of Fulton and Blenheim NYRCR Plan (NYRCR Plan) as the boundaries of both Towns. The area includes the

Towns’ agricultural and commercial areas, hamlets and residential areas, and areas damaged during Hurricane Irene and Tropical Storm Lee.

## Critical Issues

The Towns of Fulton and Blenheim NYRCR Plan details critical issues among six categories that were identified as Recovery Support Functions (RSFs) in the 2011 National Disaster Recovery Framework. The six RSFs are: Infrastructure, Housing, Economic Development, Community Planning and Capacity Building, Health and Social Services, and Natural and Cultural Resources.

Throughout the planning process, the Committee and members of the public detailed critical issues facing their communities. These include:

## Infrastructure

- **Communications Infrastructure Deficiencies -** Infrastructure was one of the most important critical issues expressed by the Committee and the public. Concerns centered around the lack of cellular telephone coverage and the need for improvements to Internet connectivity.
- **Transportation Infrastructure Improvements -** During Irene, roadway infrastructure was impacted and damaged by flooding, cutting off parts of the region, stranding residents, and making emergency access difficult for damage assessments.
- **Critical Facility and Infrastructure Protection -** There is a need to relocate and improve vital municipal facilities, especially those located in flood-prone areas. The Committee also identified protection from hazardous materials, such as oil spills and free floating natural gas tanks, as a concern.



- **Energy** - The Committee expressed significant interest in reducing the cost of energy, developing alternative green energy sources, and exploring the possibility of a rural utility service.

## Economic Development

- **Better Access to Goods and Services** - During the NYRCR Plan's development, concern was expressed about the need to improve local access to retail goods and services such as grocery stores and pharmacies.
- **Expanded Tourism Opportunities** - Tourism holds significant potential for the Towns. The Committee considered how to utilize existing tourism-related assets to increase economic development.

## Community Planning and Capacity Building

- **Emergency Management, Planning, and Communications Inadequacies** - During Hurricane Irene, government response services were unable to communicate with each other due to power outages and lack of cell phone coverage. This exacerbated the challenge of responding to emergency needs during the storm.
- **Park and Recreation Planning** - Improved quality of life through increased recreation-related opportunities for residents was identified as a critical community planning and capacity building issue.

## Natural and Cultural Resources

- **Access to the Schoharie Creek** - For both Towns, there is a need to address access to the Creek and to highlight local points of recreational interest.
- **Enhancing Cultural Resources** - Since several existing cultural resources were damaged and one was completely destroyed, there was a large hole not only in the hearts of those in the Community but in potential tourism. Enhancements to improve these resources was identified as a

critical issue to be able to renew and expand local tourism capabilities.

- **Slope and Streambank Stabilization** - The Committee identified stabilization as a critical natural resource issue.
- **Dams and Other Hazards Concerns** - Similarly, dam breaks and other hazardous threats present a natural resource issue, as well as impacting transportation infrastructure protection.

## Health and Social Services

- **Relocation of Facilities, Improved Access to Shelters, and Expansion of Emergency Operations Capacity** - The Committee consistently identified the need to establish shelters with expanded capacity that remains accessible during flooding events, relocate facilities that are in the floodplain, and improve emergency operations capacity to remain operational during a storm event.

## Housing

- **Homeowner Resiliency Implementation Assistance** - The Committee noted that homeowners are interested in making their properties more resilient and are in need of additional assistance in finding resources that could both help identify potential resiliency improvements for their homes and assist in determining the most effective approach to undertaking improvements.



## A Community-Driven Process

From the start of the planning process, the Committee was interested in collaboration between the Towns of Fulton and Blenheim, as has traditionally been done, but also with neighboring communities and the general public. Throughout the planning process, the Committee considered opportunities to build on current ongoing projects; to find more efficiencies; and to coordinate with regional organizations and agencies.

Public outreach included newspaper advertisements, email blasts, placards posted around the community, and four Public Engagement Events. These events offered the community an ideal forum to identify critical issues, share personal experiences related to storm impacts and challenges in response efforts, and recommend resiliency measures.

### Vision Statement

The Committee created the following vision statement to drive development of this NYRCR Plan:

#### VISION STATEMENT

*The Towns of Fulton and Blenheim are peaceful, resilient, rural communities. Our unique quality of life is strengthened by traditional and niche agriculture, a historical heritage, natural resources, an entrepreneurial spirit, and rich culture. We strive to provide our residents and visitors with a place to reside and meander, where values are intrinsic and the environment pristine. And above all, our greatest assets are our families, friends, and neighbors, near and far.*

The Committee invited and encouraged community participation in bi-weekly Committee Meetings and four Public Engagement Events. These meetings and events were vital forums for discussion, collaboration, and project identification.

## A Blueprint for Implementation

While Hurricane Irene and Tropical Storm Lee were particularly severe storm events, the Towns have endured flooding throughout their history. The quantitative and qualitative findings that emerged from the NYRCR planning process underpin the projects and recovery strategies in this NYRCR Plan.

The Committee, with the help of the public and Consultant Team, identified critical community assets and analyzed the degree of risk from flooding. They also identified the needs, risks, and critical issues related to their recovery from Hurricane Irene and Tropical Storm Lee. The sum of this effort is the development of a blueprint for implementation.

## From Strategies to Implementable Projects

The Towns of Fulton and Blenheim NYRCR Plan is based upon five strategies that capture the critical needs and opportunities expressed by the Community and analyzed during the planning process. Strategies yielded Proposed and Featured Projects, along with Additional Resiliency Recommendations, to assist Community efforts in rebuilding to mitigate against future risks and increasing resiliency.

### Strategies

#### Strategy 1 - Emergency Preparedness and Response:

Improve emergency preparedness and response capabilities, and expand the capacity to mitigate potential storm impacts, especially with respect to socially vulnerable populations, ensuring coordination before, during, and after storms.

#### Strategy 2 - Critical Infrastructure Resiliency:

Protect critical infrastructure, improve communications, and explore additional energy resiliency measures.



**Strategy 3 - Economic Resiliency:** Promote economic and tourism growth by providing new and expanded opportunities and marketing resources for agri-business, as well as existing and emerging local businesses.

**Strategy 4 - Regional Development:** Protect, preserve, and enhance important cultural, historic, and natural resource assets.

**Strategy 5 - Residential and Business Flood Mitigation Support:** Reduce the impact of flooding on housing, and create initiatives to assist with implementation of additional resiliency measures.

## Projects

### UNDERTAKE EMERGENCY MANAGEMENT PREPAREDNESS AND PLANNING

This Proposed Project would create a comprehensive, Multi-municipal Emergency Preparedness and Response Plan to improve the overall preparedness and future response to flooding related disasters. (Proposed Project)

### PROVIDE COMMUNITY EMERGENCY ALERT AND WARNING SYSTEMS AND SUPPORT FOR VULNERABLE POPULATIONS

This Proposed Project would coordinate existing emergency monitoring, communications, and alerting systems with new and expanded technologies and systems. (Proposed Project)

### CONSTRUCT A BLENHEIM MUNICIPAL COMPLEX

This Proposed Project involves construction of a new, consolidated Blenheim Municipal Complex to include Town Hall (municipal offices), the Fire Department, the Department of Public Works, emergency sheltering space, and an Emergency Operations Center (EOC). It is important to move and co-locate these critical facilities out of the floodplain to a more secure location (to be determined) with adequate road access, to allow responders to reach all parts of the Town, particularly during emergencies. (Proposed Project)

### REBUILD FULTON TOWN HALL TO MORE EFFECTIVELY OPERATE AS THE TOWN EMERGENCY OPERATIONS CENTER

The proposed project would update the existing Town of Fulton municipal building and enhance its ability to properly serve as an EOC. (Proposed Project)

### IMPROVE THE WEST FULTON FIRE DEPARTMENT

This Proposed Project would include the upgrade and expansion of the current property and building to provide additional capacity, reduce conflicts between different uses during emergency events, and harden the property from potential future events that could render it unusable as a shelter. (Proposed Project)

### REPLACE UNDERSIZED CULVERTS

This Proposed Project would replace six existing, undersized culverts with new culverts, sized to withstand a 1% annual flood/storm occurrence. (Proposed Project)

### UNDERTAKE A HYDROLOGY AND ENGINEERING STUDY OF THE SCHOHARIE CREEK AND ITS TRIBUTARIES

This Proposed Project would include a Hydrologic and Engineering Study of the Schoharie Creek and its tributaries to assess the condition of the Creek, its capacity during flood events, potential immediate concerns, and longer-term actions. (Proposed Project)

### INCORPORATE RESILIENCY MEASURES INTO THE BRIDGE SCHOOLHOUSE MUSEUM

This Proposed Project would rehabilitate the damaged portions of the Schoolhouse Museum structure by incorporating resiliency measures into the rehabilitation process to make the structure less prone to flood damage from future storms. (Proposed Project)



### **INCORPORATE RESILIENCY MEASURES INTO THE NEW COMMUNITY CENTER**

This Proposed Project supports the adaptive reuse of the historic structure into a community center, by incorporating resiliency measures into the rehabilitation process to make the recently-purchased structure less prone to flood damage from future storms. (Proposed Project)

### **BECOME A DESTINATION CORRIDOR BETWEEN THE CATSKILLS AND THE ADIRONDACKS**

This Featured Project would increase the visibility of the Route 30 corridor as a primary north-south route with significant tourism and recreation opportunities in both Fulton and Blenheim. (Featured Project)

### **UNDERTAKE SLOPE STABILIZATION AND ROCK SLIDE STABILIZATION EFFORTS**

This Featured Project would include stabilization efforts at two identified locations and any others identified prior to project implementation. (Featured Project)

### **DEVELOP A LOCAL STREAM MANAGEMENT AND MAINTENANCE PLAN**

This Featured Project would include development of a local Stream Management and Maintenance Plan. (Featured Project)





## TOWNS OF FULTON AND BLENHEIM NYRCR PLAN PROJECTS BY STRATEGY

Towns of Fulton and Blenheim NYRCR Plan Projects	Proposed Project	Featured Project	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Undertake Emergency Management Preparedness and Planning	X		X	X		X	X
Provide Community Emergency Alert and Warning Systems and Support for Vulnerable Populations	X		X	X		X	X
Construct a Blenheim Municipal Complex	X		X	X			
Rebuild Fulton Town Hall to More Effectively Operate as the Town Emergency Operations Center	X		X	X			
Improve the West Fulton Fire Department	X		X	X			
Replace Undersized Culverts	X			X			
Undertake a Hydrology and Engineering Study of the Schoharie Creek and its Tributaries	X			X		X	X
Incorporate Resiliency Measures into the Bridge Schoolhouse Museum	X					X	
Incorporate Resiliency Measures into the New Community Center	X					X	
Become a Destination Corridor Between the Catskills and the Adirondacks		X			X		
Undertake Slope Stabilization and Rock Slide Stabilization Efforts		X		X		X	
Develop a Local Stream Management and Maintenance Plan		X		X		X	X



# Section 1

## Community Overview



*Photo is courtesy of Raymond Adams.*





## Section 1: Community Overview

**T**hroughout the spring and summer of 2011, the Catskills had seen its fair share of rain. Agricultural communities—particularly those whose residents rely on summer rains to replenish the groundwater that fills their wells before the winter freeze—are usually pleased to receive an abundant replenishment of their water supply. In 2011 however, it had rained quite a bit—almost too much.

Numerous stormy weeks that spanned several warm-weather months were a foreboding of what was to come by late summer. By August, the regional moisture content of the ground had reached the 90th percentile, when compared to long-term averages of the same period, according to the National Climatic Data Center. Rivers and creeks swelled and the ground was saturated.

Soon, rainwater and runoff puddled on farmers' fields, and threatened to damage crops. In particular, the Schoharie Creek brimmed at its banks, and the shallow soils of the Catskill's hillsides could not absorb any more water without consequence. For the Towns of Fulton and Blenheim (Towns), nestled in the Schoharie Valley on the northern edge of the Catskills, the stage was set for a devastating flood caused by a monster storm that became known as Hurricane Irene.

### Rural Beauty, Inherent Challenges

The Towns are small, rural communities surrounded by miles of forest, farmland, and significant recreational resources. The Towns are tied together by the Schoharie Creek and by New York State (NYS) Route 30, the main



*The view from Vroman's Nose provides a panoramic view farm land and mountains of Schoharie Valley. Photo is courtesy of Melissa Graham.*

north-south route through both jurisdictions. Located in Central Schoharie County in the southern end of the Schoharie Valley and the northern edge of the Catskill Mountains, the area is known as the "Breadbasket of the Revolution" for its role in supplying grain to General George Washington and his Army during the American Revolutionary War. Farming and other agricultural pursuits were the basis of both Towns' early economies, and agricultural land is still prevalent in the Towns.

The topography of Fulton and Blenheim offers significant opportunities for outdoor recreation in and around the numerous creeks and streams in the area. Hunting and fishing opportunities are abundant. The numerous hiking trails (easily accessible from Route 30) lead to hilltop views of postcard-perfect Catskill scenery. While the Towns' outdoor resources, particularly its water resources and hillsides, provide a wealth of recreational opportunities, they also present challenges during storms and often lead to flooding.



Municipal services are limited to part-time clerks and a few full-time public works personnel in each Town. Volunteers provide fire and emergency medical services (EMS), and the Schoharie County Sheriff's Office and the New York State Police provide law enforcement. There is no municipal water or sewer service; thus, the Towns completely rely on residential and commercial wells for family and business use. Heating sources consist of wood, fuel oil, or bottled natural gas.

While most families have access to contemporary technology, such as high-speed Internet service, vast swaths of the region lack cellular telephone coverage. Because of its location in the Catskill Mountains, the region is on the fringe of the larger, Upstate New York media markets, with television news and daily newspapers originating from the Albany area, about an hour's drive to the northeast. The *Times Journal* published weekly on Wednesdays in nearby Cobleskill, provides local newspaper coverage.

## Commitment to Community

While neither Fulton nor Blenheim has a commercial center, a strong sense of community is developed and fostered through participation in local activities. Parents mingle during their children's activities at the Gilboa-Conesville Central School. Located off Route 30, the one-building K-12 school has fewer than 400 students and serves as an epicenter of community interaction for residents with children. Meanwhile, Fulton children attend schools in the Middleburgh Central School District, which has two buildings on Main Street in Middleburgh, where about 850 K-12 students attend. Additionally, some children from the Towns also attend the Cobleskill-Richmondville Central School District.

Volunteer organizations also serve as a nexus for community interaction. The volunteer fire departments, municipal buildings, mom-and-pop businesses, and

historical societies provide essential community services and are central meeting places.

Rural living, often referred to a "simple living," is actually anything but simple, as it requires an acute awareness of the natural environment, especially the weather. With large retail centers located many miles away and limited municipal infrastructure, residents in the Towns need to be self-sufficient and self-aware. They need to consider the amount of gas they have in their cars, the number of meals worth of groceries in their pantries, and the number of days' worth of fuel for their heating. They need to consider the environment and weather, as both affect their ability to access resources. Inclement weather, including heavy winter snow and ice and summer storms that cause flash floods on roads, can hinder their ability to quickly access grocery stores, the gas station, or medical care.

As such, neighbors often check on each other, particularly during times of adversity. They shop for one another and provide rides to local centers of commerce or doctors' appointments. The Towns' residents have a deep sense of collaboration and commitment to make their community more resilient to major storms and flooding. While the Towns of Fulton and Blenheim NY Rising Community Reconstruction (NYRCR) Plan is a



*Local businesses, such as the Breakabeen General Store pictured here, provide essential goods and serve as a meeting place to exchange local news, views, and needs. Photo is courtesy of Raymond Adams.*



testament to this collaborative spirit, it is important to recognize each Town's distinct and individual characteristics, as well.

## Town of Fulton

The Town of Fulton was first settled in 1715, but was formally created in 1828 from land that once was part of the Town of Blenheim. Today, the Town of Fulton, with its nearly 1,500 citizens, encompasses 65 square miles of land area that includes the Hamlets of Breakabeen, Fultonham, Watsonville, and West Fulton.

The Breakabeen Historic District, which boasts more than 30 mid-19th century Greek revival buildings, is listed on the National Register of Historic Places. Other areas of note in the Town of Fulton include Pleasant Valley, Patria, Rossman Hill, Vintonton, Fulton Hill (Fairland), Dibble Hollow, Huson Corners, Armlin Hill, Bouck's Falls, and Bouck's Island. Other notable locations include the Upper Fort (this wooden fort, built during the American Revolutionary War, presently contains a small cemetery plot), and Vroman's Nose. Vroman's Nose is a conservatory area in the Town of Fulton that draws nearly 25,000 tourists each year.

Several bodies of water provide both agricultural support and recreational activity opportunities in the Town of Fulton, including the Schoharie Creek, Panther Creek, House Creek, Heathen Creek, Keyser Kill, and Bouck's Falls (a major waterfall in Schoharie County). In addition to the extensive State-owned forest lands that permeate the Town, the Max V. Shaul State Park is located within the Town of Fulton. Overall, the three most common uses for the abundant land include residential use; wild, forested, and conservation lands; and available vacant land.

The Schoharie Creek (Creek) runs through southeast side of Fulton and is susceptible to frequent flooding. Low-lying lands along the Creek, which are largely used for agriculture, residential lots, and roadways, are also prone to flooding.

Of the 65 square miles that comprise the Town of

Fulton, the five square miles (3,347 acres) along the Creek are located in the 100-year floodplain, with an additional 66 acres within the 500-year Flood Hazard Area (FHA). As such, the risk of flooding is high in the Town.

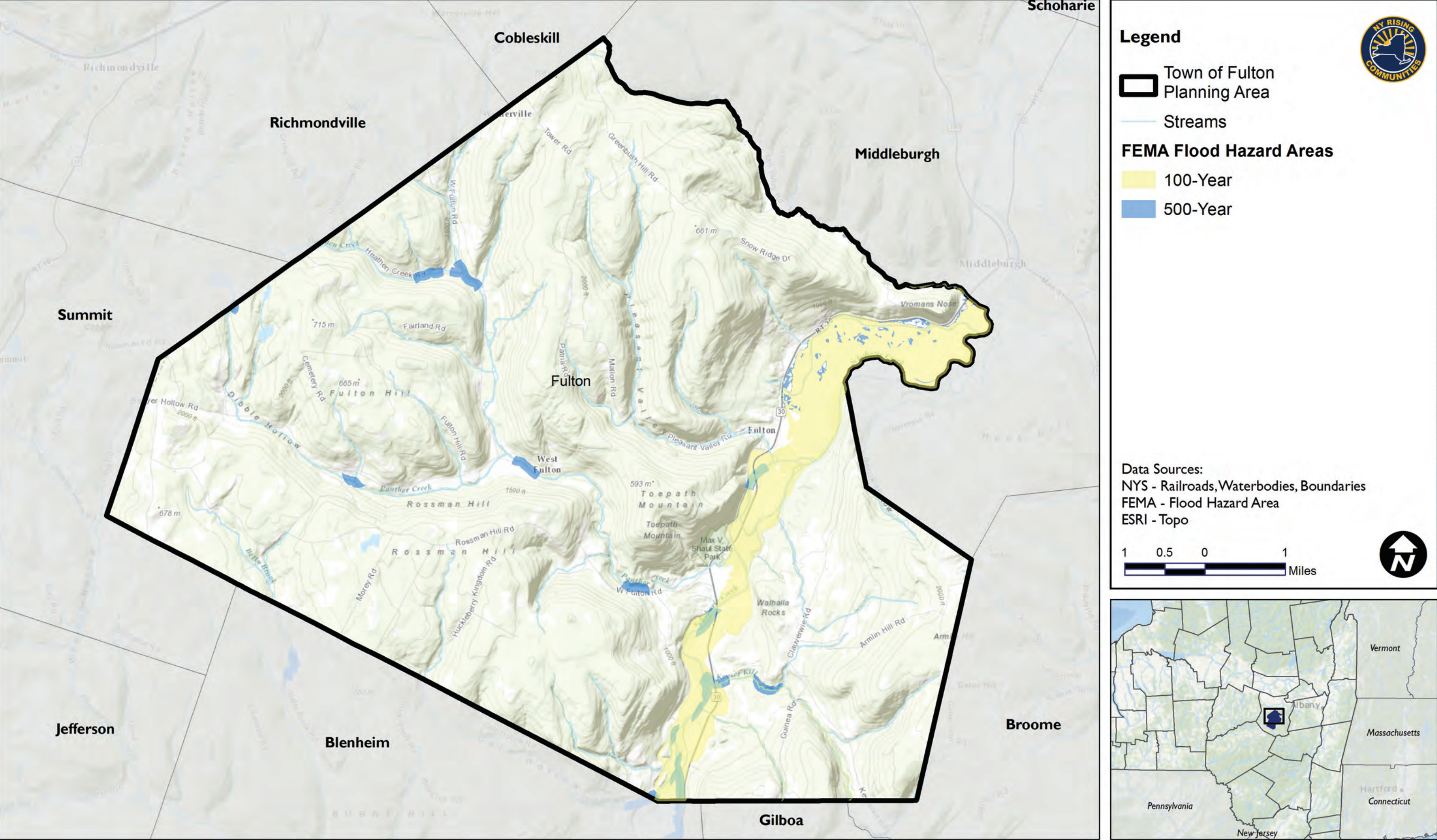
While not located in the Town of Fulton, the Gilboa Dam is located upstream of the Town of Blenheim in the Town of Gilboa and impounds the Schoharie Reservoir. Gilboa Dam and the three-billion gallon New York Power Authority (NYPA) Dam are prominent in the Town's hazard assessment and the risk perception of the residents. While the New York City Department of Environmental Protection (NYC DEP) completed a \$138 million repair project of the Gilboa Dam and the three billion-gallon reservoir behind the New York Power Authority (NYPA) Dam in October 2014, the dam plays a prominent role in any discussions concerning the Schoharie Creek and its relationship with and potential impact on the residents of the Town of Fulton. Any assessment of potential flooding associated with the Schoharie Creek in the Town of Fulton necessarily includes the role of the NYPA Dam and the Gilboa Dam, their operational contributions to flooding, the potential



*The Long Path (which begins in Fort Lee, New Jersey and runs to Altamont, New York) is a trail that crosses over Vroman's Nose in Fulton as it continues northward. This trail provides access to both regional and Adirondack trail systems. Photo of path sign is courtesy of Raymond Adams.*



NYRCR: Town of Fulton, Schoharie County  
FIGURE 1.1—FEMA FLOOD HAZARD AREA MAP







catastrophe associated with dam failure, and an ongoing concern about the proper role that both reservoirs could play in mitigating flood conditions.

Figure 1.1 depicts the Federal Emergency Management Agency (FEMA) FHAs in the Town of Fulton.

## Town of Blenheim

The Town of Blenheim, named after the Battle of Blenheim by its earliest settlers, was founded in 1787 and is one of the six original towns in Schoharie County. This rural part of New York saw some of the key skirmishes during the American Revolution, and was home to former New York State Governor John King.

The Town, with just over 300 residents, encompasses 34.4 square miles and includes the Hamlet of North Blenheim. Mine Kill State Park and State-owned forestland are popular natural areas in the Town, and are visited by thousands of tourists each year.

The Town of Blenheim is a residential area, with some agricultural use. Single-family homes dot its rolling hills and elevated flatlands; many of these homes have been owned by the same family for generations. Former residents of more urban areas, such as New York City, own many of the other residences in Blenheim and now enjoy quiet living in the Catskills.

While the Town includes abundant State-owned forest lands, two parks—one at the Blenheim Town Hall and Bridge Park—offer picnic and recreational areas for residents and tourists. Prior to the destruction caused by Hurricane Irene, the Old Covered Blenheim Bridge and Schoolhouse Museum were popular tourist attractions. Lansing Manor House Museum and North Blenheim Historic District are cultural attractions in the Town, and are listed on the National Register of Historic Places.

Blenheim, like Fulton, has several creeks and streams, including the Schoharie Creek, Mill Creek, West Kill, Mine Kill, Betty Brook, Cole Brook, Mill Brook, and Doney Hollow Creek. The Schoharie Creek (Creek)

is the primary water feature in Blenheim. While the Creek is considered a Town asset because of its beauty and natural resources, it creates flooding challenges to the Town. Several homes are along the Creek, as well as the Blenheim Town Hall, which includes the Blenheim Volunteer Fire Department and the Highway Department. Approximately two square miles of land are within the 100-year Flood Hazard Area (FHA) (as shown in Figure 1.2). In addition, the Town contains the Lower Blenheim-Gilboa Reservoir and a portion of the Upper Blenheim-Gilboa Reservoir.

As noted in the previous section, the Gilboa Dam and the NYPA Dam, just upstream from the Hamlet of North Blenheim, are central to any discussions of previous and future flooding in the area. Record inflows and outflows from these dams during the height of Hurricane Irene in 2011 underscore the need to resolve flood hazards and issues. In 2007, the NYC DEP made public its concerns about the Gilboa Dam and its ability to perform during record storm events.

The \$138 million repair of the Gilboa Dam in October 2014 strengthened the structure to better withstand extreme flooding. However, perceived inadequacies of systems designed to protect the public, such as reservoir and dam monitoring, reservoir flood mitigation, communications to impacted residents about emergencies and extreme conditions, and the need for robust local emergency plans, will be among ongoing discussions about the Schoharie Creek and the Town of Blenheim.



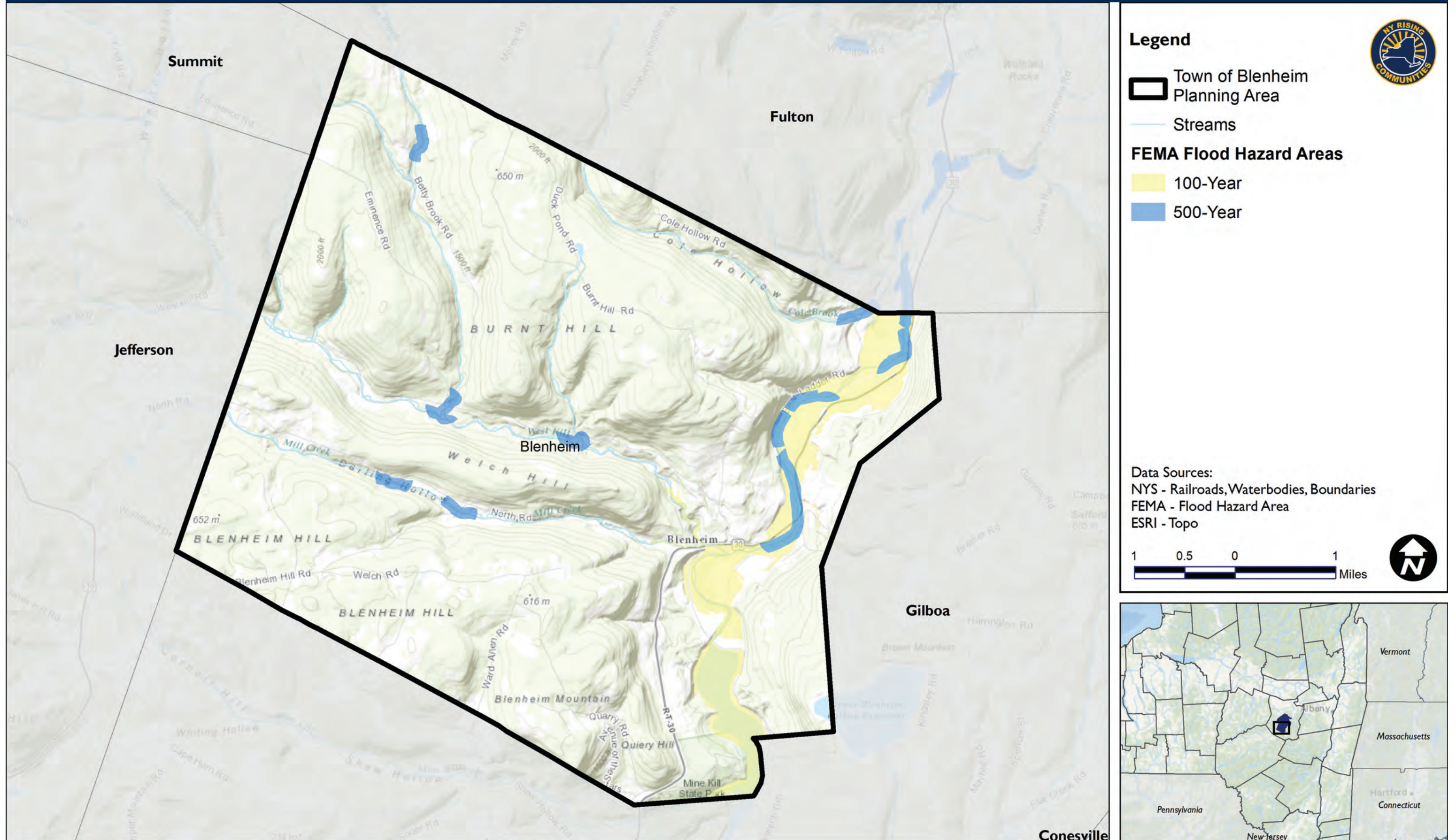
*Pictured here is the wooden Old Blenheim Bridge in its pre-Hurricane Irene condition. Photo is courtesy of Melissa Graham.*





Shown here is the Welcome to Blenheim sign. Photo is courtesy of Raymond Adams.









## Fulton and Blenheim: Who We Are

### Population

Part of the basis for a discussion about community resilience is an understanding of local demographics. The Towns of Fulton and Blenheim (Towns) are small Catskill Mountain communities. Collectively, their populations total 1,819 people (according to the 2010 U.S. Census), with 1,442 in the Town of Fulton and 377 in the Town of Blenheim. Based on local knowledge, a survey conducted in 2011, and a limited analysis of Census data, the Consultant Team estimated that the local population may increase by several hundred people in peak times of the year, when second-home owners and part-time residents are present.

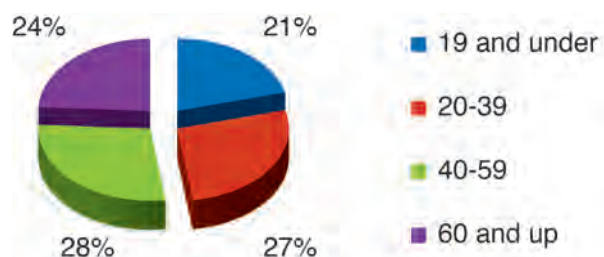


*Aging trends and income levels influence resilience planning. Photo of elderly man's hand and cane is courtesy of Tetra Tech, Inc..*

While age distribution in the Towns varies by municipality (see Figure 1.3 and Figure 1.4), the population is clearly aging. The current median age in the Town of Fulton is 49.4 years, and in the Town of Blenheim, the median age is 49.6 years; this is trending upwards from 36.6 years and 47.7 years in 2000, respectively. These median ages are in considerable contrast to the State median age of 38.

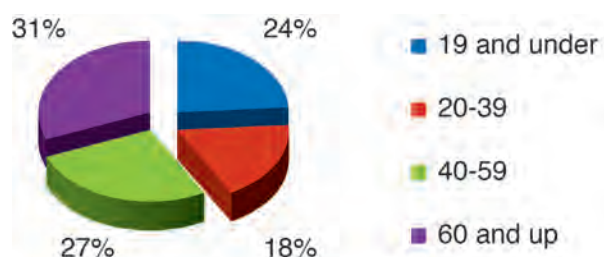
The Towns' aging trend manifests in declining school populations and a potential for "brain drain," issues associated with a small pool of potential volunteers to provide community-based programs and services, and an increasing number of elderly who are vulnerable during disasters.

### FIGURE 1.3—TOWN OF FULTON AGE GROUPS



*Figure 1.3 is a pie chart of Fulton's age groups. Source: US Census 2008-2012 ACS*

### FIGURE 1.4—TOWN OF BLENHEIM AGE GROUPS



*Figure 1.4 is a pie chart of Blenheim's age groups. Source: US Census, American Community Survey, 2008-2012*

### Housing

Housing stock in the Towns primarily consists of single-family homes. The Towns have a total of 1,178 housing units—838 in the Town of Fulton and 340 in the Town of Blenheim. Single-family, detached residential structures account for more than 80% of the housing units, with median home values less than the median for Schoharie County.

The Towns' local character and charm can be attributed, in part, to numerous historic homes. Of the existing housing stock in the Towns of Fulton and Blenheim, 33.2% and 39.7%, respectively, were built before 1939. The majority of the Towns' housing stock was built between 1960 and 1999, with just 3.8% of the housing stock in the Town of Fulton and 10% in the Town of Blenheim built after the year 2000.





Many local homes were built in the Greek Revival style. Photo of example home is courtesy of Raymond Adams.

The ages of the homes are significant, as older housing stock typically requires more costly maintenance, and may not comply with current floodplain regulations and contemporary construction standards.

The large number of vacation and second homes in the Towns skews vacancy rate statistics, but U.S. Census information suggests that of the 525 vacant units noted in the Towns, at least 446 (85%) of vacancies are residences used for seasonal or vacation purposes.

## Critical Infrastructure

Significant sections of the Towns' roads, bridges, and culverts are prone to flooding and are frequently damaged during extreme storms. Residents rely on the viability of these roads as transportation lifelines to facilities that are essential to their safety and well-being.

During severe storm events, every major transportation corridor can be compromised and hinder evacuation, access to hospitals, medical facilities, fuel sources, pharmacies, and supermarkets. The protection and functionality of infrastructure in the Towns is essential to provide for personal safety and property protection, and to ensure that people are not isolated during storms.

The primary thoroughfare through the Towns is NYS Route 30. During previous storm events, this route was severely damaged and impassable in several locations, making it difficult for the Towns' residents and first responders to reach some areas. A network of local roads exists and is vital to transportation into, out of, and through the Towns; however, they too are often severely impacted by flooding as was the case during Irene and Lee.

Town facilities are also important to local well-being. In Blenheim, one facility serves as the Town Hall, Fire Department, Highway Department, and Post Office. This facility is in a flood-prone area, making the location difficult to access as a command center, gathering place, or shelter in the event of a flood-related emergency.

The Fulton Town Hall is housed in a facility with the Highway Department. The size of this building limits its utility for Town operations during extreme weather events. The West Fulton Fire Department has served as an emergency shelter during past storms in addition to housing the fire department and apparatus.



Major roadways in the Towns can become inundated with floodwater, particularly in low-lying areas near agricultural parcels. Floodwaters not only damage crops and can make roads impassable, but undesirably transport nutrients, sediment, and debris. Photo of roadway and farm in distance is courtesy of Raymond Adams.



A propane gas pipeline runs through the northern part of Blenheim. In 1990, the pipeline (then owned by Texas Eastern) exploded, killing two people, injuring several others, and burning 17 structures in the Town. The existing municipal building was moved to its current location following the explosion. Now owned by Enterprise Products Partners, LP, this pipeline remains a concern for residents who want to ensure that adequate precautions are taken to withstand hazards, such as erosion and seismic activity.

The Blenheim-Gilboa Pumped Storage Power Project, owned and operated by the New York Power Authority (NYPA), is located in the Town of Blenheim and the Town of Gilboa, below Dave Brown Mountain. In the late 1960s and early 1970s, some 3,000 acres of land (81 parcels) were acquired from Blenheim and Gilboa by eminent domain to create the project. The Blenheim-Gilboa Pumped Storage Power Project Power Project is currently going through a relicensing process with the Federal Energy Regulatory Commission (FERC).

Though located in the Town of Gilboa and owned by the New York City Department of Environmental Protection (NYC DEP), the Gilboa Dam impounds the nearby Schoharie Reservoir. This reservoir contributes to the public drinking water supply for New York City as part of the Catskill Water Supply System, and is important to Fulton and Blenheim residents, as well as other communities downstream from potential issues related to flooding, water releases, and dam failure. The water behind these dams flows west and north toward Blenheim and Fulton. While these dams are not used as flood control structures, they do allow flow exceeding peak capacities to move downstream into the Schoharie Creek.



*The New York Power Authority operates a 1 million kilowatt pump storage facility that uses power generated from the Upper and Lower Reservoirs and draws water from the Schoharie Creek. Photo of Power Authority sign is courtesy of Raymond Adams.*

## Economics

Historically and currently, agriculture is the anchor of economic activity in the Towns of Fulton and Blenheim. Schoharie County Agriculture District #1 includes farm properties in both Towns. Agriculture is the largest economic activity in the Town of Fulton, although there has been a shift from dairy farming to production of vegetables, feed grain, and hay. In the Town of Blenheim, diversified farms specialize in meat production, hay, and cash crops.

Overall, economic growth in Schoharie County has been slow, if not declining, since the 1970s. Factory and manufacturing jobs in the County have declined, forcing residents to commute to jobs elsewhere, especially in the Albany Capital District.

Significant acreage in the Towns is owned by governmental agencies, with the State of New York being the largest governmental property owner. In Fulton and Blenheim, governmental agency-owned land includes State-owned forestland and parks, and NYPA properties. These properties do not generate tax revenue, and are not available for economic development; however, they do play a role in the overall economy, by providing regional jobs and attracting tourists.





In addition, the significant number of summer and second homes in the Towns highlights the need for a balance between seasonal and full-time residents. The local grocery store in Middleburgh was destroyed during Hurricane Irene; without local access to food and necessities, residents primarily needed to travel to Cobleskill to shop.

Schoharie County is considered to be part of the Appalachian Region and in the jurisdiction of the Appalachian Regional Commission. The Commission is a partnership of Federal, State, and local government, and funds projects to increase job opportunities and strengthen the capacity of the region to compete in the global economy.



Local farm and outdoor markets, as shown above, provide fresh food products. Photo is courtesy of Raymond Adams.



Agricultural crops, shown above, have played a large role in the Towns' economy for several centuries. Photo is courtesy of Raymond Adams.

## Social Vulnerability

Many tools exist to inform community resilience planning efforts. One tool used during the NYRCR planning process was a Social Vulnerability Index (SOVI) developed through a partnership with the University of South Carolina and the National Oceanic and Atmospheric Administration (NOAA). The SOVI measures the social vulnerability of populations to environmental hazards.

SOVI helps users examine differences in social vulnerability among population groups at the Census Block Group Level. Factors such as poverty, age (older or younger age groups), unemployment, and rural areas are incorporated to calculate the level of social vulnerability from high to low. It shows differences in capacity for preparedness and response, as well as areas where resource use would be most effective to reduce vulnerability. SOVI is also useful as an indicator to determine the level of recovery from disasters.

Populations in the Towns of Fulton and Blenheim are largely of medium-to-high social vulnerability according to the SOVI analysis. The analysis confirms what local knowledge, experience, and intuition have noted during Committee discussions: the demographic characteristics of the Towns, and limited local resources and available regional resources, make disaster response and community rebuilding and recovery especially challenging.



Despite its scenic beauty, rock deposition, shown here, can impede the capacity of this waterway and inhibit flow during major storm events. Photo is courtesy of Raymond Adams.



## Geographic Scope of the NYRCR Plan

Because extreme flooding affects all residents and businesses in the Towns, even those outside of the flood hazard area, the Towns of Fulton and Blenheim NYRCR Planning Committee (Committee) identified the geographic scope of the Towns of Fulton and Blenheim NYRCR Plan as the boundaries of the Town of Fulton and the Town of Blenheim (shown in Figure 1.5). The area includes the Towns' agricultural and commercial areas, hamlets and residential areas, and those areas that were damaged during Hurricane Irene and Tropical Storm Lee. For the purposes of the planning process, the Committee focused on projects within this area.

## Description of Storm Damage

Across upstate New York, the summer of 2011 was wet. Very wet. According to the National Weather Service, the spring of 2011 yielded more than 16 inches of rain above normal levels, and an additional 18 inches fell in early summer.

The excessive rainfall in the spring and summer of 2011 was both a blessing and curse to the Towns. While it is true that too much water causes floods, the riverine communities in the northeastern United States rely on the plentiful annual rainfall to support agriculture; ensure that rivers and streams can support fish, wildlife, and power generation; and restore water levels in the wells of local residents and businesses. However, high water levels can reach a tipping point, and suddenly, the negative aspects outweigh the positive.

While Irene and Lee were particularly damaging, they were not the first flood-damaging storms to hit these communities. The Towns of Fulton and Blenheim are vulnerable to flooding and have experienced devastating losses over the years. The Schoharie County Multi-Jurisdiction Hazard Mitigation Plan (2013) ranked flooding as a moderately high-risk hazard in both the Towns of Fulton and Blenheim. Since 1996, a total of 29 flood events have occurred in Schoharie County. Of those floods, 13 have had a significant impact on the

## Glimpses of Resolve and Resiliency

*Melissa Cornell (now Melissa Graham) grew up in Blenheim, New York. She went away to college, but returned soon after graduation. It was not long after her return to her hometown that she met Keith Graham, the son of some of her parents' closest friends from nearby Jefferson. The two began to date and were married in 2002.*

*By 2006, they had their first daughter and in 2009, they bought their current home on Creamery Road in Blenheim. Nestled in the woods of the Schoharie Valley, their home was a perfect place to raise their child, to be close to their families, and to run their business that was housed on land next door.*

*Their home, like many newer homes in the area, does not have a basement. Instead, crushed stone under the elevated foundation allows rainwater from the frequent summer storms and winter snowmelt to be quickly absorbed into the ground.*

*Melissa's story is rare in most Catskill Mountain small towns, as a majority of the children raised in these towns and villages move from the area permanently. Young families, particularly those that start their own local businesses, are increasingly hard to draw. The Grahams had invested their future in Blenheim and were building out their dreams.*

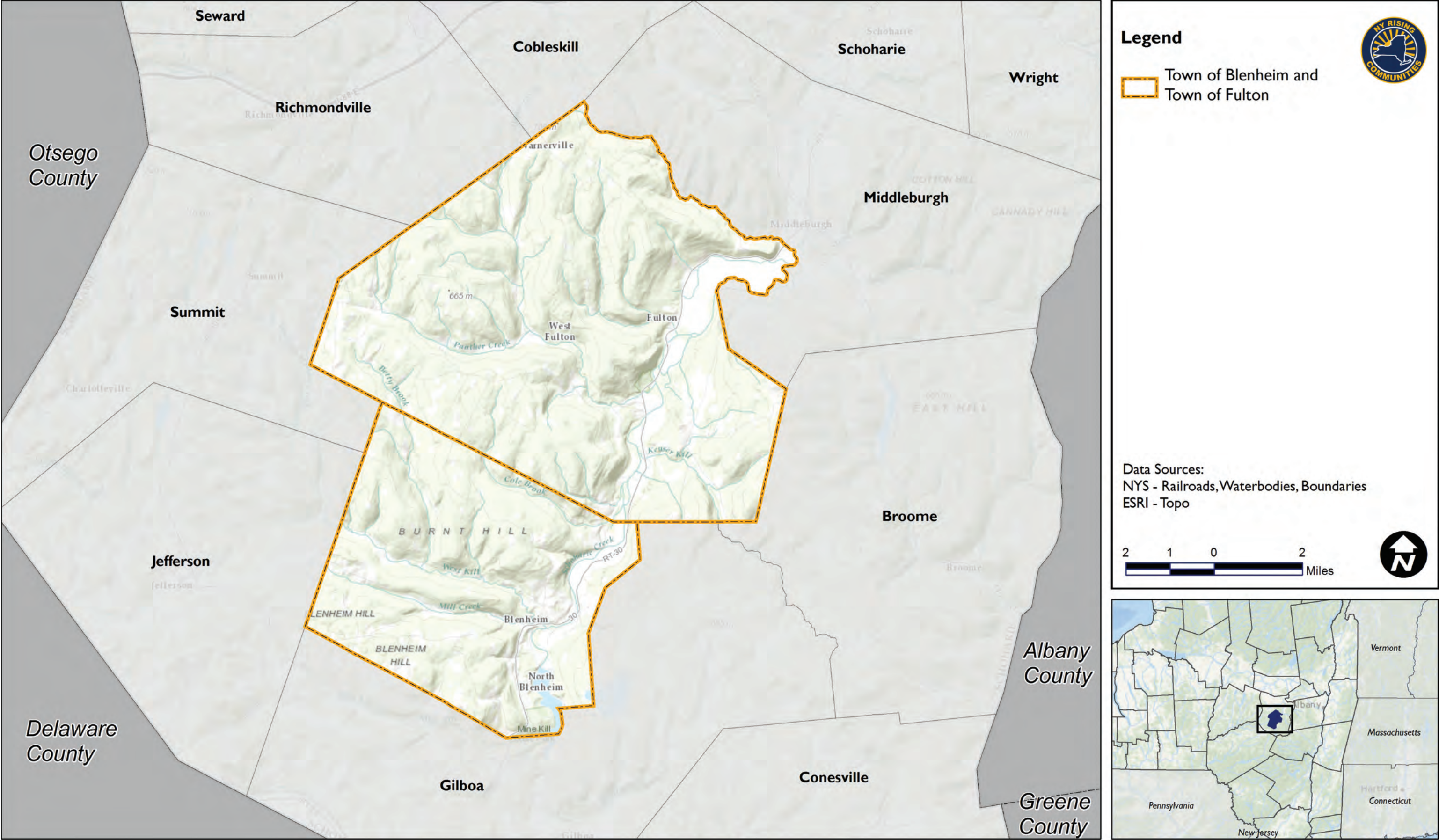
communities affected. Flood damage is a serious threat to both Fulton and Blenheim, as there is a 72% annual chance that a flood event will significantly impact one of the Towns, and a 56% chance that a Federal disaster declaration will be issued because of flooding. Between 1954 and 2011, Schoharie County received 10 Federal disaster declarations due to flooding.

The Town of Fulton's 86.2 miles of highway and 17 bridges, and the Town of Blenheim's 44.6 miles of highway and 8 bridges are vulnerable to flood damage from floodwaters, flash flooding, washouts, and resulting road closures.

The Schoharie Creek Watershed poses the greatest flooding threat to Fulton and Blenheim, because of the valley location of the Towns. The two dams at the southern portion of Schoharie Creek, the Gilboa Dam, and the Schoharie Reservoir, aid in flood forecasting and warning for areas located downstream.



NYRCR: Town of Blenheim and Town of Fulton, Schoharie County  
FIGURE 1.5—OVERVIEW MAP







Flooding occurs when the Blenheim-Gilboa Dam Pump Station exceeds 10,000 cubic feet per second (cfs). Regional plans direct that area evacuations begin at 14,000 cfs, and major flooding can be expected at 20,000 cfs.

## Hurricane Irene

### **HURRICANE IRENE** **AUGUST 25—SEPTEMBER 5, 2011**

*Schoharie County, New York, was designated eligible for Public Assistance and Individual Assistance to aid in recovery from the disaster.*

In late August 2011, State, County, and local officials watched Hurricane Irene track up the East Coast of the United States. By August 24, 2011, forecast models showed that New York State needed to prepare for a major storm event. The focus, however, was in the metropolitan New York City and Long Island areas of the State. In that region, government officials began informing communities about the potential dangers of the storm and ways to prepare. Local and national news outlets increased their coverage of the storm. Evacuations were advised in many areas, and vulnerable populations in hospitals, nursing homes, and care centers were moved to safer areas.

Across New York's upstate communities, particularly the eastern half of the State, weather forecasts called for widespread rain and gusty winds, but the damaging impacts of the approaching hurricane were expected to be felt in the southeastern-most regions only. Officials advised all residents to keep an eye on the storm via local media.

By Friday evening, August 26, 2011, New York City and Long Island were making extensive preparations for the hurricane to strike. While warnings and messages of concern had been made across all of eastern New York State, most residents of the Catskill region went to sleep that night without much fear about the storm, other than the anticipation of a rainy weekend.

## Community is Spelled V-O-L-U-N-T-E-E-R

*Freda Clapper, Cherie Clapper, and Joyce Paterson are three of the most active members of the West Fulton Volunteer Fire Department's Auxiliary. For years, they have dedicated their time to serving meals at Fire Department meetings and events. They regularly host functions at the Town Hall, keep the Fire Hall kitchen stocked on a modest budget, and get out of bed late at night to offer hot coffee to volunteer fire fighters on snowy Upstate winter nights.*

*Freda Clapper and Cherie Clapper both married into the Clapper family. Freda has lived in the area the longest, having been born in West Fulton nearly 75 years ago. Except for a brief, three-year period many years ago, she has spent her entire life living on the mountainside.*

*Cherie moved to West Fulton almost 70 years ago, when her family relocated from New Jersey in 1949 during the Eisenhower administration. Short in stature and with more a New England than New York accent in her voice, Cherie is a passionate advocate for the community, attending every NYRCR Planning Committee Meeting.*

*Joyce Paterson is a relative newcomer to Fulton, and her story is typical of retirees in this area. She and her husband moved from Staten Island, where they raised their family almost 18 years ago. They bought a log cabin in the woods, and their children and grandchildren visit and stay with them a few times a year. After her husband passed away five years ago, she decided to remain in West Fulton with her friends and continues to be actively involved in the community. While many more members make up the West Fulton Fire Department's Auxiliary, Freda, Cherie, and Joyce's stories represent what "community" means in this small, rural town.*



*Flood damage ate away at this home's foundation. Photo is courtesy of Keith Graham.*



The cool mountain air in the Catskill region affected the cloud cover created by Hurricane Irene. The storm's northeastern movement slowed as it made landfall. The energy provided by the ocean quickly began to dissipate. As it cooled, the remnants of the storm could no longer hold the water, and rain began to fall with even more vigor. Areas of the northeast, from the middle of New York State across New England, were inundated. Record-breaking rainfall caused extraordinary flash flooding. While flash floods occur often in this part of New York, the amount of rain during this storm was unprecedented, with more than 12

inches of rain falling in just a few hours on the morning of August 27, 2011. Winds knocked down power poles and lines, damaged roofs, and blew yard furniture way.

In the Towns of Fulton and Blenheim, the Schoharie Creek—which generally runs adjacent to Route 30 in the valley—swelled over its banks, rising more than 20 feet and wreaking havoc. Homes, streets, government buildings, electrical and communications infrastructure, businesses, parks, bridges, and culverts were damaged or destroyed. The damage left residents without communications services, access to food, or clean water, and also compromised local medical services.

### Adrenaline Rush by Floodwaters

*By 2011, Jason Hardendorf had been the volunteer Fire Chief of the West Fulton Fire Department for about two years. He joined the Department in 1998, soon after he was old enough to legally volunteer as a firefighter in New York State. The small Department, with two engines and one large tanker to carry water (as no hydrants or municipal water exists in Fulton or Blenheim), responds to a few fires every year, but most dispatches are for car accidents and calls for medical assistance.*

*On the morning of Saturday, August 27, 2011 he woke to the sound of his pager activating and the voice of the County dispatcher calling for all fire departments to “man your stations.” Having heard similar requests during power outages and storms in the past, Jason assumed that the power had been knocked out in his area, probably by a car accident.*

*Before he could leave the house his telephone rang. On the other end was the secretary to the County Emergency Manager. She stressed to him that he really needed to get to the station. It was raining out and the National Weather Service had issued flood warnings for Schoharie County. Jason thanked her and stepped up his pace, leaving his house in the dark and noting the torrential rain. As he drove the few miles along the winding mountain roads to the fire station in his pick-up truck, his ability to see was hindered by the unrelenting rain and he could make out the creeks and drainage areas alongside the roads. He was not certain how long it had been raining but regardless, every creek and drainage ditch was filled or overfilled with rushing water. He realized, having seen his share of floods over the years, that all the water was headed to the low-lying areas below and that families would need help evacuating their homes. He flipped on his emergency lights and stepped on the gas.*

The roadway infrastructure of the region was immediately and severely impacted by the storm. Citizens could no longer use NYS Route 30, and the hamlets were completely isolated. The washout of Route 30 made the Hamlet of North Blenheim landlocked and entirely cut off from the surrounding area. Many other roads suffered damage, and were still closed as of September 7, 2011. Citizens, the Committee, and public safety officials, reported widespread roadway inundation and near 100% impassability.

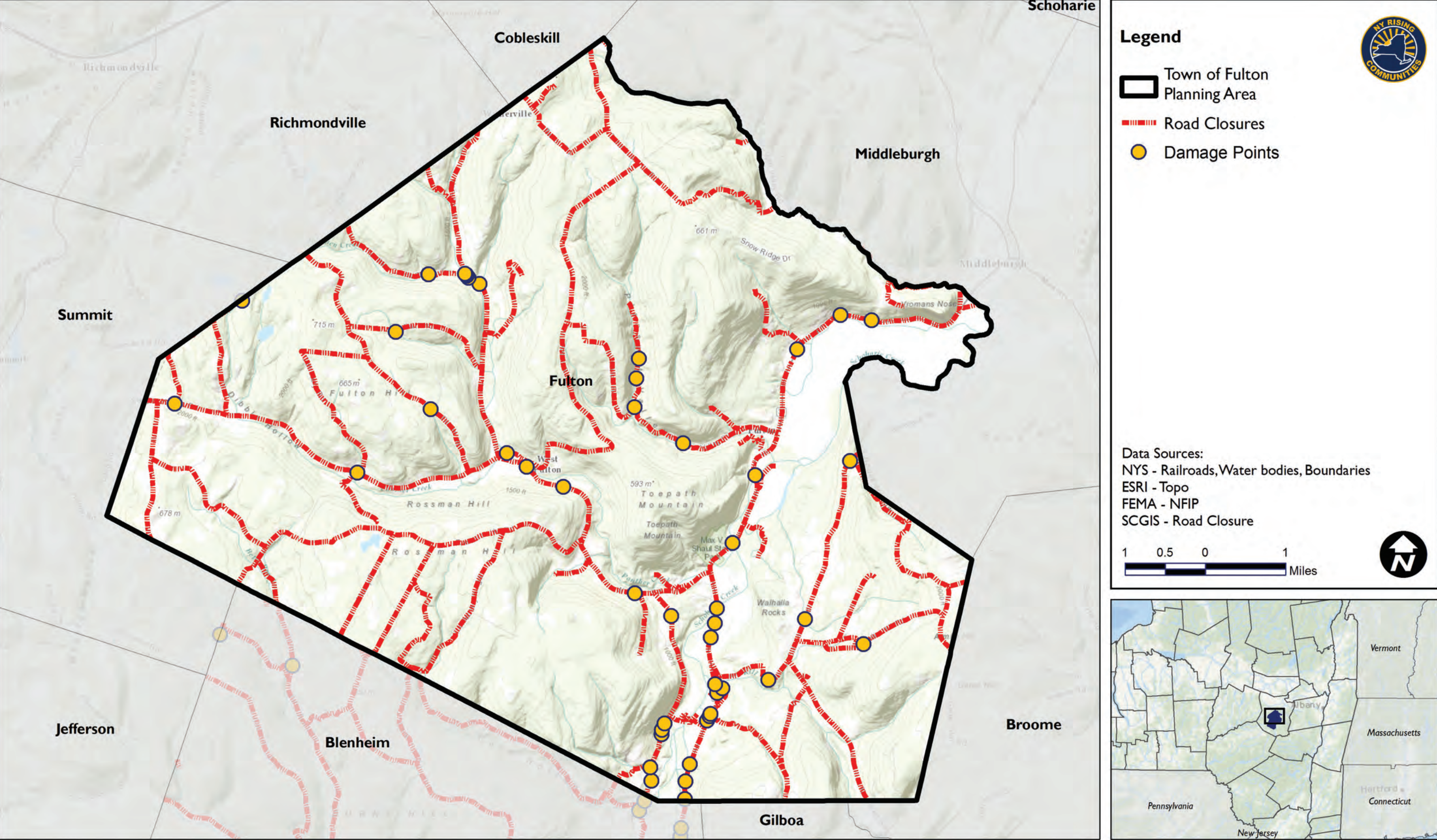
*Melissa and Keith Graham awoke to find water rushing through their yard. Keith quickly put on his high boots and made his way to their warehouse for their family business next door. The couple, working with his family, had built a successful pharmaceutical repackaging business, the contents of which needed to be kept both dry and temperature controlled. They employed 25 local residents and dedicated well more than 40 hours a week to building their livelihood.*

*On arrival at the warehouse, Keith found the power out and water surrounding the buildings. As he worked to protect their business, the warning sirens from the Gilboa Dam activated. Melissa rushed to get their daughter ready, fearing for her husband's safety, and knowing that they needed to get to higher ground immediately.*

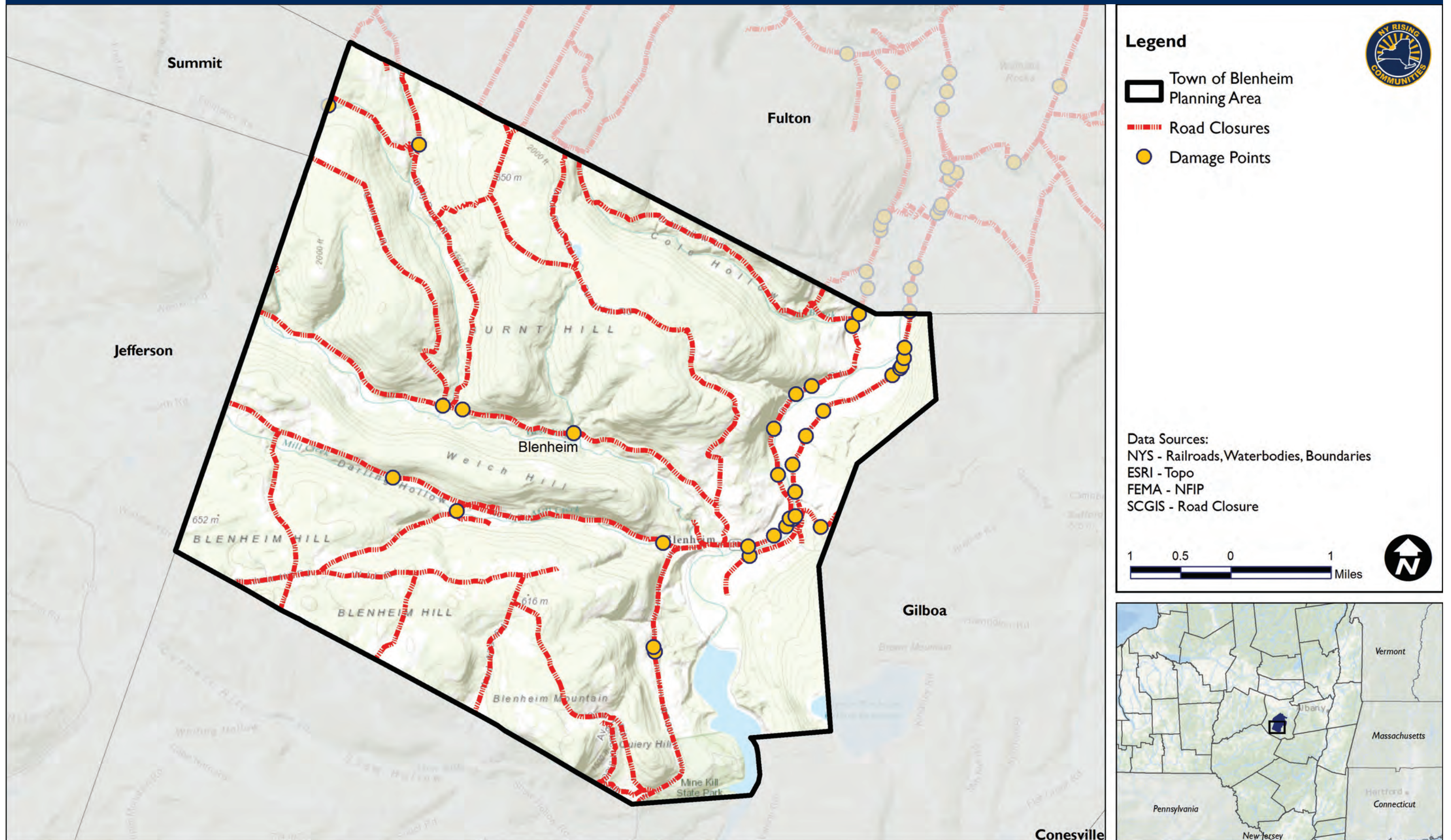
Figures 1.6 and 1.7 indicate the storm damage that occurred in the Towns of Fulton and Blenheim.



NYRCR: Town of Fulton, Schoharie County  
FIGURE 1.6—DAMAGES MAP











*Hurricane Irene unleashed devastating rains. Photo of house in five-foot flood waters is courtesy of Melissa Graham.*

It is important to understand, when attempting to quantify the number of roads closed during the storm that the environment was rapidly changing. Therefore it is necessary to consider road closures in three different categories during this major storm:

- those closed due to water overtopping them;
- those closed due to debris (e.g., sand, trees and rocks); and
- those closed due to major damage of the roadway infrastructure (e.g., washed out, buckled pavement, bridge or culvert destruction).

As such, during Irene's heaviest period of rainfall and immediately thereafter, as rain water made its way down from the hills to the creeks and streams below, nearly every roadway in the region was overtopped and impassable, at least in part. Even high-axle emergency response vehicles were unable to safely traverse the region. By late Sunday evening and Monday morning, most of the sheet flooding from mountain-sides had ended. As emergency responders and public works officials began to travel the Community, they were able to determine which roads were safe and could be reopened. Despite the positive change in that the highest floodwaters had begun to recede, they did find extensive debris and infrastructure damage. Evacuation routes were damaged and impassable for the first 48 hours following the storm but began to be cleared by residents and emergency responders, allowing for some travel, albeit in many cases rough and difficult travel. Even days and weeks after the storm many roads were not fully opened as they were undergoing repairs and/or full reconstruction. New York State (NYS) Route 30, the main route through the Communities, was heavily damaged and topped by floodwaters in many

places including the bridge crossing over the Schoharie Creek in the Town of Blenheim (pictured below) which impassable due to debris on the bridge.

Overall, during the first 48 hours following the storm, vehicular travel throughout the Community was virtually impossible. Twenty-two roads within the Towns of Fulton and Blenheim were still closed as of September 7, 2011.

Road damages were not the only infrastructure impacts associated with the storm. Luckily, the high water that overtopped the Gilboa Dam did not result in a dam breach or failure. Rather, the automated sensing system failed, and activated the warning systems and sirens. Remote sites at monitoring stations erroneously indicated dam failures, leading County emergency personnel with no choice but to take activate dam failure sirens and protective actions.

While the floodwaters subsided after the storm ended, Hurricane Irene left the Towns in a state of disrepair, with isolated residents and destruction, including impassable roads, damaged or destroyed buildings and farms, lost crops and livestock, and downed communications systems.

Two beacons of cultural and architectural advancement in Blenheim were devastated during Hurricane Irene: the Blenheim Covered Bridge and the Schoolhouse Museum. Built in 1855, the Blenheim Covered Bridge had been the longest wooden single-span bridge in the world. It served as a tourist attraction for over 150 years, and was incorporated into the Town seal. Hurricane Irene destroyed the Blenheim Covered Bridge and the damaged the nearby Schoolhouse Museum.

Quick-moving floodwaters caused extensive erosion to stream banks and vegetation loss, and covered the Towns in debris. According to information gathered by U.S. Geological Survey (USGS), stream gauges along Schoharie Creek from August 28 to 29, 2011, peak discharges in North Blenheim by the Gilboa Dam reached about 120,000 cfs. By comparison, the discharge seen on the Schoharie Creek eclipsed the average discharge of Niagara Falls (80,000 cfs). Prior to



Hurricane Irene, the closest peak discharge was in 1985 at 80,000 cfs, significantly less than the Irene-related peak discharge.

The devastating effects of Hurricane Irene forced the evacuation of people from the area, including residents from the Towns of Fulton and Blenheim. County emergency plans identify 29 evacuation routes for use in the event that the Schoharie Basin is flooded. Of these 29 evacuation routes, 15 were fully passable, 10 had sections that required lane restrictions or short detours, and 4 were impassable. Of the seven routes applicable to Fulton and Blenheim, Pleasant Valley Road was impassable, and Mallon Road and Flat Creek Road had restrictions; the other four routes were passable. By August 31, 2011, approximately 3,370 customers across Schoharie County were still without power. The rural and mountainous terrain of the region, however, meant that entire regions were cut off from others.

Local officials estimated that over 6,860 Schoharie County homes were damaged or impacted from the storm. A total of 13 shelters were established in the County, including at the Blenheim and the West Fulton Fire Department Stations.

In October 2011, damages in Schoharie County were estimated to be approximately \$92.5 million. Nearly 1,600 residents in the County registered for Individual Assistance from FEMA, and almost 100 of them received the maximum amount of \$30,200. As of November 2011, 51 County residents were eligible for temporary housing.

In response to the devastation, a state of emergency was issued for Schoharie County at 1:00 p.m. on August 28, 2011. On August 31, 2011, at New York Governor Andrew M. Cuomo's request, President Barack Obama issued a major disaster declaration (DR-4020) for New York State and the counties damaged by Hurricane Irene.

Clean-up efforts were difficult and were further complicated by additional flooding caused by Tropical Storm Lee, which hit the region soon after Hurricane Irene.

*Cherie Clapper awoke to the sound of the torrential rains. It was barely daylight outside. She went to her basement and started her sump pumps. Living in the hills of region meant living with floods and water. This process was one she had performed many times before. As her morning coffee brewed, someone came to her door. It was a young, college-aged man she knew from the Fire Department. He reported that the chief had sent him out to get the auxiliary members to come to the station. It was flooding again, and they needed to open a shelter.*

*By mid-morning, Chief Hardendorf and his crews were in the valley, lifting stranded families from their front porches in either hip-waders and ropes or small boats. The Fire Department's high-axle vehicles carried families first to higher ground and then to the Fire Department, where Cherie, Joyce, and Freda had opened a makeshift shelter. By nightfall, more than 100 local residents were crowded into the fire station. Joyce and Freda helped everyone organize card and board games. Cherie kept the kitchen working. Young Matt Hudson, who had come to her door hours earlier, happened to be a culinary student at a regional college. Using whatever ingredients he could find, including box after box of food evacuees had brought with them, he made meals for everyone that Cherie described as "some of the best food we've ever eaten."*

*It was at the end of the first day that Freda told her friends about the tree that had crashed through her house just before she left for the fire department that morning. Shocked that she had still decided to come and assist, despite her home being so heavily damaged by the tree that had smashed her roof and punctured the home, she said that her only concern had been for her 27-year-old grandson who had been asleep on the couch. Everything else could be fixed.*

*The shelter continued operating for the next two weeks. Every day, the number of people at the fire hall shelter would decrease, as either homes were restored to safety, or residents made arrangements to stay with family and friends. In the end, Chief Hardendorf summed it up perfectly "When this happens, everyone pulls together. This is a tight community."*



*Pictured here is a home along Mill Valley Road in Fulton in the aftermath of Hurricane Irene with flood waters half way up the side of the house. Photo is courtesy of Linda Quinn.*





## Tropical Storm Lee

### **TROPICAL STORM LEE**

*September 7—10, 2011 - EM-3341 / DR-4031 Schoharie County, New York, was again designated eligible for Public Assistance and Individual Assistance for recovery efforts.*

On September 7, 2011, just after floodwaters from Hurricane Irene had receded, remnants of Tropical Storm Lee swept into the region, producing substantial rains and river flooding across parts of central New York State. Throughout the day on September 8, 2011, bands of heavy rain brought streams back to flood levels, and threatened more flooding in areas of Fulton and Blenheim that were still trying to recover from the effects of Hurricane Irene.

The majority of impacts from Tropical Storm Lee in Fulton and Blenheim were primarily caused by the weakened state of critical infrastructure and on-going operations following Hurricane Irene. The Towns were still in states of emergency when the second round of heavy rain moved through the region. Runoff from the storm was not as severe as was experienced during Hurricane Irene, but was significant enough to break through some of the temporary stream channel and roadway repairs that had been completed in the aftermath of Hurricane Irene.

On September 13, 2011, at Governor Cuomo's request, President Obama issued a major disaster declaration for the State of New York and the State of New York and the counties devastated by Hurricanes Irene and Lee.



*Unrecognizable roads were decimated from storm damage, as power lines snapped and roads caved under floodwaters. Photo is courtesy of Melissa Graham.*

## Critical Issues

With the storms still fresh in the minds of everyone participating in the planning process, the Committee and members of the public were easily able to detail the critical issues and elaborate on each. Throughout the planning process, several critical issues were repeatedly discussed and became further defined as needs and opportunities, discussed in Section 2 of this Town of Fulton and Blenheim NYRCR Plan.

## Infrastructure

### **COMMUNICATIONS INFRASTRUCTURE DEFICIENCIES**

Cellular telephone coverage is lacking in both Fulton and Blenheim. The Towns are also in need of improved Internet connectivity. During Hurricane Irene, the land-line communication system was compromised, and first responders were unable to communicate efficiently and effectively with the residents and citizens during the disaster.

To help this communication issue, two-way radios were distributed to emergency response personnel and community leaders so they could be notified about emergencies. However, communications problems continued when the radios did not operate in the valley areas due to the area's topography, which limits the range of use.

Recently, a cell tower was approved for the Breakabeen area that will cover large portions of Route 30 in Schoharie Valley, and is expected to significantly improve cellular coverage. However, many areas will continue to lack cell phone coverage.



*Melissa and her young daughter stayed with her mother-in-law the first night following Hurricane Irene. After it became apparent that the dam had not failed nor was it going to, Keith returned to their business to assess the damage, salvaging what he could and sleeping on the floor during the first night. Melissa came back and saw water running through their daughter's swing set. Melissa's mother-in-law cares for a family member with Down syndrome and for whom emergency situations are particularly stressful.*

*After the first night, Melissa's mother-in-law had no choice but to take him to a hotel in Cobleskill where power and running water could be found, thus creating as normal an environment as possible (though Cobleskill was also flooded from Tropical Storm Lee).*

*In the coming weeks, the Graham family would realize losses at their business in the tens of thousands of dollars. After looking into the options available to recover from this disaster, they decided to sell their business. Today the family works for the company that bought them out. They have repaired the damage to their home and continue to live in Blenheim. Their daughter is in third grade at Gilboa-Conesville Central School and her new sister is two years old.*

*Their story reflects three of the most commonly considered aspects of disaster response and recovery: families, businesses, and persons with special needs. However, the family's resilience that got them through this storm existed long before anyone had heard of Hurricane Irene. It has been strength for them and for the entire community of Fulton and Blenheim and serves as the foundation for their efforts to build their future.*



*This truck half way sunk in flood waters and covered in debris originally came from Prattsville, upstream, and ended up in Blenheim during the storm. Photo is courtesy of Melissa Graham.*

## ROAD IMPROVEMENTS

A somewhat-limited road network in the Towns creates ongoing safety and economic challenges. In particular, many homes currently have few access and exit routes (or only one) available. This can lead to the possibility of residents being stranded during flood events, such as what happened during Hurricane Irene.

During Irene, roadway infrastructure was impacted and damaged by flooding, cutting off parts of the region, stranding residents, and making emergency access difficult for damage assessments. This has proven to be a recurrent challenge when severe rainstorms or major snow melts occur in the region. Historically, two types of flooding occur: (1) inundation due to sheet flooding as waters drain from the hills; and (2) flooding from increased stream, creek, and drainage area levels, both volume and flow rates, causing road damage.

When broad inundation occurs, areas become “islands;” travel between one area to another cannot be undertaken safely as roads are temporarily impassible. While water flows tend to ebb quickly, damage to roadways can be significant in the long term and result in the need for temporary and long-term repairs and reconstruction, often closing roads for long periods of time.

Select enhancements of core infrastructure would help strengthen resiliency against future storms and ensure the protection of assets and safe mobility of residents. Reducing rockslide potential at the Fulton/Blenheim Town Line and on Bear Ladder Road would help to make the areas more resilient. Improvements to State Route 30 for a roughly a ½-mile segment north of Blenheim Town Hall would make the important evacuation route usable during emergencies. In addition, culvert upgrades that can handle 100-year and 500-year storm events (1% and 0.2% annual chance of flooding) would help to ensure that roads remain open for emergency and evacuation purposes.



## BICYCLE AND PEDESTRIAN IMPROVEMENTS

It is important to include traffic-calming measures to road improvements to increase pedestrian and bicycle accessibility. Specifically, the Committee has voiced interest in implementing trail system connections to specific locations, improving shoulders for bicycling and walking, and implementing streetscape and traffic-calming improvements in the hamlets and more-developed areas throughout the Towns.

The Committee and public noted the need to create new and safer methods for pedestrians to cross streets, as well as use the sides of roads safely for exercise, particularly in the hamlets and more-developed areas. Ensuring people are able to move throughout the Town without the need to rely on an automobile was a priority discussed in several Committee meetings.

Public interest in this issue came about primarily because recent road improvement projects have not always included the addition of bicycle and pedestrian infrastructure, despite the call for these inclusions. In 2011, New York State passed Complete Streets legislation requiring State, county, and local agencies to consider the convenience and mobility of all users when developing transportation projects. State and Federal funding can support road projects that increase accessibility.

Overall, the Committee would like to implement “Complete Streets” principles, and believes that resiliency measures could be implemented to advance some of these actions. The Complete Streets planning principle includes roads that provide safe, convenient access for all users, including pedestrians bicyclists, and motorists of all ages and abilities.

## CRITICAL FACILITY PROTECTION

The need to relocate and improve critical municipal facilities, especially those located in flood-prone areas, became clear following Hurricane Irene and Tropical Storm Lee. Both Fulton and Blenheim Town Halls are used as emergency command centers. Neither are adequately equipped to do so however, and both

would benefit from upgrades. Specifically, upgrades to the Fulton Town Hall would allow it to better serve as an Emergency Operations Center (EOC). And if the Blenheim Town Hall/Fire Department needs were relocated out of the floodplain and properly equipped to provide EOC functions, it also would be better positioned to serve the Community if future disasters.

## CRITICAL INFRASTRUCTURE PROTECTION

Protecting the liquid propane pipeline that runs through the Towns is critical. Erosion around the pipeline has been found during previous flooding events, raising concerns about the safety of this asset in vulnerable locations. Pipeline exposure from flooding increases the likelihood of the pipeline, developing an issue. This remains a concern for residents who want to ensure that adequate precautions are taken to withstand hazards, such as erosion and seismic activity.

Several other utility issues are also present throughout the Towns. In general, most power lines are aboveground and are located alongside roads, drainage ditches, and other areas that are subjected to flooding. This increases the risk for service outages during hazard events.

## HAZARDOUS MATERIALS PROTECTION

Hazardous materials are always a concern when it comes to flooding. During Hurricane Irene, anything caught up in the floodwaters was carried downstream and deposited on farmland, in yards, and on undeveloped land. Hazardous materials, such as gas tanks and any material used by businesses in their production processes creates a concern. The materials must be properly mounted to resist floodwaters and where applicable, moved to higher ground and storage areas above the high water level. Ensuring that these materials do not get transported downstream and deposited on residential lots and agricultural lands is vital to protecting public health and important economic assets.





A petroleum pipeline runs through the Town of Blenheim. Photo of pipeline is courtesy of Raymond Adams.

## ENERGY

Access to low-cost energy sources is an issue the Community would like to address. The Town of Blenheim has been considering opportunities to reduce energy costs with an overall goal to establish a rural utility service, similar to the Delaware County Electric Cooperative. The Town of Fulton has also noted concern about high energy costs, and expressed interest in reducing them as well.

Citizens are interested in developing options for alternative “green” energy sources, gaining access to reduced energy rates, and exploring ways the Towns could partner with organizations to develop a rural utility service.

## Housing

### RESIDENTIAL RESILIENCY

Both Fulton and Blenheim have a number of residential structures in the special Flood Hazard Area (36 in Fulton and 46 in Blenheim). Many homeowners would like to make their properties more resilient. There is also the potential for property acquisitions and residential relocation. These “buy-out” options offer property owners a chance to relocate away from the floodplain when it might be difficult to sell or repair their property.

## Economic Development

### EXPAND ACCESS TO GOODS AND SERVICES

Both Towns have limited access to grocery stores and pharmacies, and the residents and citizens must travel to other communities to shop for goods. Middleburgh had the only local grocery store, which was flooded during Hurricane Irene. Residents must now travel nearly 30 minutes to Cobleskill to shop. Additional options for residents to “buy local” and support the area’s agri-businesses is an important consideration.

### EXPAND TOURISM OPPORTUNITIES

Fulton and Blenheim have many tourism opportunities that are not as prominent to potential tourists as they could be. Tourism holds significant potential for the Towns to enhance economic development opportunities and build on existing tourism assets.

The Community would like to increase the visibility of the Route 30 corridor and expand tourism opportunities. It would also like to showcase local foods and crafts by establishing a Farmers and Artisans Market. Promoting homegrown foods and crafts will increase pride in the Towns, and increase interest from surrounding communities.

Currently, the area is predominately visited by day trippers who use the local trails and parks, or buy farm goods from stands along Route 30 on their way to other destinations. There is a desire to tap into the recreational potential that could come from increased flows in the Schoharie Creek, which would allow for improved fishing and recreational use of the waterway.

In addition, the Town of Blenheim considers rebuilding the historic Blenheim Covered Bridge at its original location a priority, in order to leverage other assets in the area for economic development. When completed, this project will fill a significant cultural and tourism void in North Blenheim.





## Community Planning and Capacity Building

### EMERGENCY MANAGEMENT, PLANNING, AND COMMUNICATIONS

During Hurricane Irene and Tropical Storm Lee, it became clear that coordination and communication is a challenge when the Towns of Fulton and Blenheim found themselves unable to communicate with each other or other agencies. First responders from Blenheim were based in a flood-prone area, and impassable roads made it impossible for them to reach people in need, especially in some of the valley locations. In addition, a public awareness campaign is needed to inform residents of evacuation routes, shelter locations, and methods to shelter-in-place. Additional consideration of emergency planning for evacuations of livestock and pets is also a significant need in the Community.

### PARK AND RECREATION PLANNING

For both Fulton and Blenheim, a Parks and Recreation Plan project was identified as a critical need to address access to the Schoharie Creek and to highlight local points of interest.



*The introduction of additional park land could provide a double asset: one that increases recreational options, while also serving a specific flood-protection role. Photo of open soccer field is courtesy of Raymond Adams.*

## Health and Social Services

### RELOCATE CRITICAL FACILITIES AND PROTECT/IMPROVE ACCESS TO SHELTERS AND EXPAND EMERGENCY OPERATION CAPACITY

Critical assets were impacted and damaged by flooding in the wake of Irene and Lee, and need to become more resilient to future storm impacts. Through this planning process, the Committee consistently identified the need to establish shelters with expanded capacity that remains accessible during flooding events.

In Fulton, the West Fulton Fire Department Station is a certified American Red Cross shelter; however, many residents were unable to reach the shelter during the storms. The Gilboa-Conesville School was also used as a shelter, but no generator or emergency communications system is in place at this location. Other shelter locations were inaccessible because of flooding.

Options for multi-use facilities to provide community resources—such as a new Town Hall/Fire Station/Highway Department/Emergency Operations Center building in Blenheim outside the floodplain—would allow these facilities to remain fully operational during a storm event.

### ACCESS TO MEDICAL RESOURCES

The Towns currently lack the necessary services to provide transportation for vulnerable populations, such as who need medical attention, or the elderly population. There are several options to help address this issue, though none of them are necessarily easy to implement in rural areas. Regardless, meeting the challenges to address this type of lapse in services is vital.

Some options discussed throughout the planning process include establishing a health clinic in the area (probably the most difficult option to implement); providing better medical transportation service from the Towns to area medical centers; and/or creating a volunteer organization that would provide first aid and medical attention during emergency events.



## ACCESS TO CLEAN WATER

Access to clean water during and after a storm is a concern for the Towns. For those who lost fresh water on their property, emergency responders were able to bring in fresh water quickly after floodwaters receded. The issue that remained was the contamination of wells, which made them unusable for a period of time after the storm. In some cases, residents have not been able to drill a new well, and are still relying on bottled water.

## Natural and Cultural Resources

### ENHANCE CULTURAL RESOURCES

The tragic loss of the Blenheim Bridge, leaving behind only the abutments on both sides of the Creek, left a hole, not only in the hearts of those living in Blenheim, but also in the tourism capabilities of the Town. The bridge was a large part of the Town's identity. Blenheim has plans to rebuild the bridge and improve the landing areas, and is currently seeking funding to construct an exact replica; however, a replacement is expensive and may take some time to complete.

Adjacent to the former Covered Bridge is the Bridge Schoolhouse Museum. This structure suffered some damage and is undergoing a restoration project. Just to the south, the Town of Blenheim is working on rehabilitating the former Presbyterian Church into a new community center. All three of these projects are extremely important for Blenheim's identity and future tourism opportunities.

### STREAMBANK RESTORATION

In both Towns, streams are in need of significant restoration. Streambank stabilization has been noted as a major need to protect development and agriculture along Pleasant Valley Creek, although it is needed in other locations, as well. This restoration includes, but is not limited to the removal of debris, rock, and gravel that has accumulated over the years, especially during recent floods. Restoration of streambanks is also needed to control water flow during flooding events to minimize erosion and water quality degradation. Additional vegetation is needed along

the banks of streams and creeks, because much of the vegetative cover, including trees, was lost during Irene. While trees have been recently replanted in some areas, many did not survive because of subsequent heavy rains.

### SLOPE STABILIZATION

The Committee identified flooding and damage related to high-velocity runoff as a concern. High-velocity runoff is likely to cause slides, which have the potential to create extensive damage in the areas where they occur. One such location is along Route 30 at the Fulton/Blenheim municipal line. If it occurred at this location, a slide could threaten life and property, and could cut off the major north-south route through the Towns.

### DAMS AND OTHER HAZARD CONCERNS

Dam breaks are a major concern that were discussed throughout the planning process. The potential devastation that could be caused by a dam break would be catastrophic. The planning process considered these concerns, along with other potential hazardous situations, such as wildfires and NYPA water releases, all of which have disaster preparedness and resiliency needs.

Throughout the planning process, the need was mentioned for more formal coordination and communication with NYPA regarding releases from the dam during flooding events. Additionally, the Committee identified the need to improve emergency responder coordination during disaster events. This issue relates to the communications infrastructure limitations that are present throughout the NYRCR Planning Area.

In addition, local seismic activity has increased, and the awareness and concern about dam stability in light of a seismic event has been discussed more frequently. While a few dam improvement projects are underway and studies of dam structural integrity have been conducted, this issue remains a concern for many in the area.



## Community Vision

Through reviews of existing plans and studies, and discussions at the Committee level, the Committee adopted a Vision Statement to guide the Towns of Fulton and Blenheim through recovery and resiliency efforts.

### VISION STATEMENT

*The Towns of Fulton and Blenheim are peaceful, resilient, rural communities. Our unique quality of life is strengthened by traditional and niche agriculture, a historical heritage, natural resources, an entrepreneurial spirit, and rich culture. We strive to provide our residents and visitors with a place to reside and meander, where values are intrinsic and the environment pristine. And above all, our greatest assets are our families, friends, and neighbors, near and far.*

## Relationship to Regional Plans

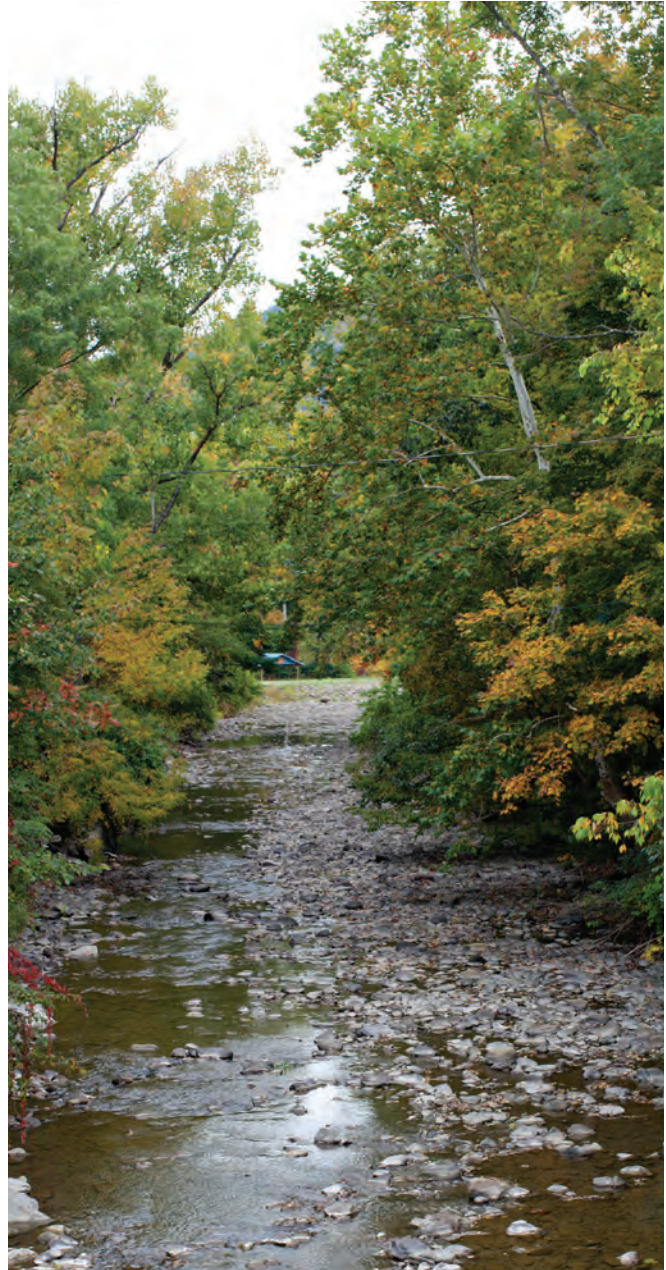
The Committee recognizes that regional collaboration is important in planning for a resilient future, and that it is important to identify shared issues and opportunities beyond the boundaries of the Towns.

This NYRCR planning process included a review of existing plans. In particular, a review of regional plans was conducted to identify opportunities for regional collaboration beyond the boundaries of the Towns of Fulton and Blenheim. Opportunities related to the Schoharie Creek and its tributaries, emergency planning and preparedness, and tourism are among the areas for regional partnerships.

## Review of Existing Plans

The Towns of Fulton and Blenheim have engaged in the development of a series of plans and studies, as have the municipalities, Schoharie County, and the greater region. The Consultant Team reviewed these plans, including long-range strategic planning, economic

development, hazard mitigation infrastructure, housing, environmental protection, and (in Blenheim's case) a long-range disaster recovery plan. It is important for both Towns to leverage these plans and studies, and note the consensus that was shared between them as they developed the Towns of Fulton and Blenheim NYRCR Plan. A list of the existing plans and studies reviewed is included in Table 1.1.



*Many local waterways are filled with rock and debris, limiting optimal flow. Photo rock-filled creek bed is courtesy of Raymond Adams.*



**TABLE 1.1 – REVIEW OF EXISTING PLANS AND STUDIES**

Resource	Relevance	Key Components for NYRCR Planning Process
After Action Report and Improvement Plan—July 2012	This Plan discusses the response to Hurricane Irene and Tropical Storm Lee and identifies areas of emergency preparedness and response actions that can be improved upon by Schoharie County.	Detailed past flood information; analysis of response to the disasters; evaluation of needs and functional improvements.
Blenheim New York Long-Term Community Recovery Plan—May 2012	Completed in 2012, this Plan specifically targeted the vulnerabilities exposed and damage sustained during the 2011 storm season. It provides local strategies and recommended actions for mitigating all potential hazards to the Town of Blenheim.  It provides detailed information on past and current flood issues, stream and hydrological conditions, past and current flood initiatives, documented public outreach and involvement, recommendations for additional mitigation actions to address future disaster events, and the re-establishment of economic growth.	Detailed past flood information; local facility information; hazard vulnerabilities and flood-related issues; assessed values and potential losses; past and ongoing mitigation projects; regional collaborations/initiatives; proposed mitigation initiatives with timeframes and budgets. Most of the projects are able to fall into one of the six Recovery Support Functions required in the NYRCR planning process.
Mohawk Valley Regional Economic Development Council Plan	This Plan provides an assessment of existing conditions and economic opportunities within the region, details a vision and strategies to implement the vision, and identifies priority projects for implementation.	Identifies priority projects; details a regional economic development vision and associated strategies to implement the vision.
Mohawk Valley Regional Sustainability Plan	Part of the Cleaner, Greener Communities Program, this Plan discusses smart growth practices that will improve economic development and the environment of the region.  It provides information on economic development, transportation, land use and livable communities, water management, materials management, energy, and agriculture and forestry.	Economic development; smart growth; goals and implementation plans for each of the topic areas.
Mohawk River Watershed Management Plan—Draft September 2014	This Plan focuses on the Mohawk River Watershed, which includes both the Main River and the Schoharie watershed. The Plan addresses the quality and ecological function of water resources, flood hazard risk reduction and enhanced flood resilience, fish and wildlife habitat, smart growth land policies, promotion of agriculture, and watershed awareness.	Water resources and water quality information; identifies priority projects related to hydrology and ecology.
Schoharie County Multi-Jurisdictional Hazard Mitigation Plan—2013	This Plan provides County and local strategies and recommended actions for mitigating all potential hazards to the County.  It provides detailed information on past and current flood issues, stream and hydrological conditions, past and current flood initiatives, vulnerabilities to natural resources, emergency services, prevention and planning, property protection, and recommendations for additional mitigation actions to address future disaster events.	Detailed past flood information; local facility information; hazard vulnerabilities and flood-related issues; assessed values and potential losses; past and ongoing mitigation projects; regional collaborations/initiatives; proposed mitigation initiatives.
Schoharie County Long-Range Economic Development Strategy	This Strategy provides a regional economic development plan for Schoharie County, New York.  It outlines strategies for economic growth, as well as hamlet revitalization, by capitalizing on the region's assets, including its proximity and influence from the State Capital.	Inventory of existing conditions and key trends; County vision; identified goals; priority projects for economic development.





**TABLE 1.1 – REVIEW OF EXISTING PLANS AND STUDIES (CONT'D)**

Resource	Relevance	Key Components for NYRCR Planning Process
Town of Blenheim Comprehensive Plan—Draft 2013	This Plan establishes a vision for the future growth, development and protection of the Town of Blenheim. It provides overarching goals and recommended implementation actions for all areas of the community, including (but not limited to) infrastructure, community facilities, housing, economic development, and natural/cultural resources.	Community vision; detailed community/demographic/economic data; goals and recommendations for all areas of community and economic development; critical issues; past, current, and recommended projects/initiatives.
Town of Fulton Comprehensive Plan—1990	This Plan establishes a vision for the future growth, development, and protection of the Town of Fulton. It provides overarching goals and recommended implementation actions for all areas of the community, including (but not limited to) infrastructure, community facilities, housing, economic development, and natural/cultural resources.	Community vision; detailed community/demographic/economic data; goals and recommendations for all areas of community and economic development; critical issues; past, current, and recommended projects/initiatives.
Town of Fulton Draft Comprehensive Plan—July 2014	This update to the 1990 Comprehensive Plan discusses a vision and objectives to provide long-range guidelines for land use within the Town of Fulton. Specifically, the draft discusses objectives related to growth, agriculture, housing, commercial development, industrial development, floodplain development, natural features, traffic, environmental considerations, tourism, and recreation.	Community vision; community and demographic data; goals and global recommendations for land-use planning.



## Stakeholder Input and Regional Collaboration

From the very start of the planning process, the Committee was interested in collaboration between the Towns of Fulton and Blenheim, as has traditionally been done, but also with neighboring communities. Throughout the process, the Committee considered additional opportunities to affect change on a regional level, build on current ongoing projects, and work together to find more efficiencies. Infrastructure projects that would assist in greater resiliency in both Towns were considered, in addition to regional economic development pursuits.

Coordination with regional organizations and agencies were a significant part of the planning process. The Committee coordinated with numerous government agencies and entities at the State and local levels, emergency responders from the Towns of Fulton and Blenheim, the Schoharie County Planning and Development Department, Schoharie County Soil and Water Conservation District, and the Schoharie County Emergency Management Office.

Members of the aforementioned County agencies attended Planning Committee Meetings and participated in interactive discussions with Committee members and actively reviewed local challenges. Additional coordination with State agencies through the State Agency Review Team (SART) helped to inform the planning process and led to the identification of projects.

Based on a review of regional plans and discussions during Planning Committee Meetings, the following opportunities for regional collaboration are suggested:

- Additional regional coordination for emergency planning and preparedness with area agencies and non-profit organizations;
- Coordination on Schoharie Creek hydrology studies and stream bank restoration;
- Expansion of regional tourism marketing and the creation of a scenic byway along NYS Route 30;
- Improved access to goods and services; and
- Improved access to medical care.



# Section 2

## Assessment of Risk and Needs



*Photo is courtesy of Raymond Adams.*





## Section 2: Assessment of Risk and Needs

### Community Assets and Assessment of Risk

**T**he Towns of Fulton and Blenheim NY Rising Community Reconstruction (NYRCR) Plan was developed to provide a comprehensive assessment of the existing conditions and needs of this NYRCR Community (Community). The NYRCR Plan is action-oriented and implementable, and should make the Community more resilient to the potentially devastating effects of future storms. To gain a comprehensive understanding of the Community's strengths and vulnerabilities, which became readily apparent during Hurricane Irene, the Towns of Fulton and Blenheim NYRCR Planning Committee (Committee) analyzed the Community's important economic, health/social services, housing, infrastructure, and natural/cultural assets.

The Committee, with support of the Consultant Team, identified critical assets likely to be affected by flood events within the boundary of the Towns' NYRCR Planning Area. The Committee reviewed and refined all aspects of the assessment, and collectively approved the results.

### Inventory Process

#### DATA COLLECTION

The New York State Department of State (NYS DOS) Risk Assessment Work Group facilitated the development public and private sources that were provided to the Committee. In addition to the data provided by NYS DOS, the Consultant Team compiled local-level data from the Schoharie County Geographic Information



*Public Engagement Events, such as the one pictured above, provided valuable local knowledge about the importance of particular community assets. Photo is courtesy of Tetra Tech, Inc..*

System (GIS) and the Hazard Mitigation Plans for the Towns. Data was also gathered from Committee members during scheduled meetings and from attendees at the first Public Engagement Event.

The Committee reviewed a list of assets initially pulled from sources indicated here, and added assets based on local knowledge and in consultation with administration staff from the Towns.

#### ASSET CLASSIFICATION

The Recovery Support Functions (RSFs) serve as the structural roadmap for this NYRCR Plan as indicated at right and in Figure 2.1. There are six RSFs that were established by President Barack Obama in 2011 through the *National Disaster Recovery Framework* (NDRF). These RSFs serve as the coordinating structure for key areas of Federal emergency assistance.

The RSFs are meant to support local governments by facilitating problem solving, improving access to resources, and fostering coordination among government agencies, non-governmental partners, and stakeholders. Identified assets were reviewed and classified into five categories in accordance with the NDRF. These categories are summarized in Table 2.1.





**FIGURE 2.1 –  
RECOVERY SUPPORT FUNCTIONS**



### **RECOVERY SUPPORT FUNCTIONS**

#### **Community Planning and Capacity Building**

*Focuses on the community's ability to implement storm recovery activities and how to plan to mitigate the effects of future storms.*

#### **Economic Development**

*Focuses on returning economic and business activities to a healthy state following a disaster.*

#### **Health and Social Services**

*Focuses on identifying key needs that are critical to protecting the health and well-being of all residents from the effects of a post-disaster environment, particularly vulnerable populations.*

#### **Housing**

*Focuses on the provision of safe and adequate housing for current and future residents.*

#### **Infrastructure**

*Focuses on replacing or improving infrastructure to respond to disasters.*

#### **Natural and Cultural Resources**

*Focuses on leveraging these resources, while protecting manmade assets.*

Each asset was also assigned attributes, such as its community value, whether it is considered to be a critical facility, and whether the asset serves socially vulnerable populations. The community value was assigned to each asset based on Committee discussions and a ranking exercise. Generally, infrastructure assets and health and social services assets were given a “high” community value to indicate their importance. The community value of other assets trended toward medium; however, there was more variation in these categories.

Assets were classified as either “critical” or “non-critical” facilities. Critical assets are those that (1) are essential to health and welfare of the whole population and if severely damaged; and (2) would reduce the availability of essential community services necessary to respond to an emergency. Critical facilities may include emergency service facilities, such as hospitals and other medical facilities, fire stations, public works facilities, evacuation shelters, schools, and other uses that house special needs populations. Other facility assets that were identified by the Committee as locally significant to the Community were categorized as “No, Locally Significant.”

The Towns of Fulton and Blenheim NYRCR Plan Asset Inventory and Risk Assessment can be found at Section 5: Additional Materials.

## **Description of Risk Areas**

The level of risk associated with flooding is an important measure of the potential frequency and likelihood of flood inundation in particular areas. Hurricane Irene inundated the Community and pushed the high-water mark for flooding well past any levels that had been established previously. That major storm, in particular, was a wake-up call for many to the potential risk the Community faces in the event of major flooding events.

To assess risk in the Towns of Fulton and Blenheim NYRCR Planning Area (NYRCR Planning Area), several sources were consulted, including current Federal Emergency Management Agency (FEMA) Flood Hazard

**TABLE 2.1 – ASSET CATEGORIES**

Asset Class	Examples
Economic	Office buildings, business and industrial parks, manufacturing facilities, warehouses, storage facilities, grocery stores, restaurants, banks, lodging, storefronts, downtown center, and seasonal/tourism destinations
Health and Social Services	Schools, health care, daycare, eldercare, emergency operations, government and administrative services, media and communications, police, fire, and rescue
Housing	Single-family and multi-family dwellings, supportive housing/group homes, senior housing, and affordable housing
Infrastructure Systems	Pedestrian/bicycle/vehicular ways, transit, bridges, airports, rail, ports, ferries, gas stations, water supply, stormwater, wastewater, solid waste, recycling, and power generation facilities
Natural and Cultural Resources	Natural habitats, Wetlands and Marshes, recreation facilities, parks, public access, open spaces, agricultural areas, religious establishments, libraries, museums, historic landmarks, and performing arts venues

Source: NYS DOS, 2013

Area (FHA) datasets, FEMA National Flood Insurance Policy (NFIP) severe repetitive loss data, and damage point data provided by Schoharie County (which was reviewed by the Committee). Based on NYS DOS categories, risk was mapped in descending order of risk magnitude as “extreme,” “high,” or “moderate.”

Because the NYRCR Planning Area includes a significant amount of land outside of the riverine risk area (as defined by the NYS DOS Riverine Risk Assessment Tool) and outside the FEMA FHA, the Committee decided to add to the “moderate” risk area, where past flood damage has repetitively impacted residential properties, transportation infrastructure, and emergency operations.

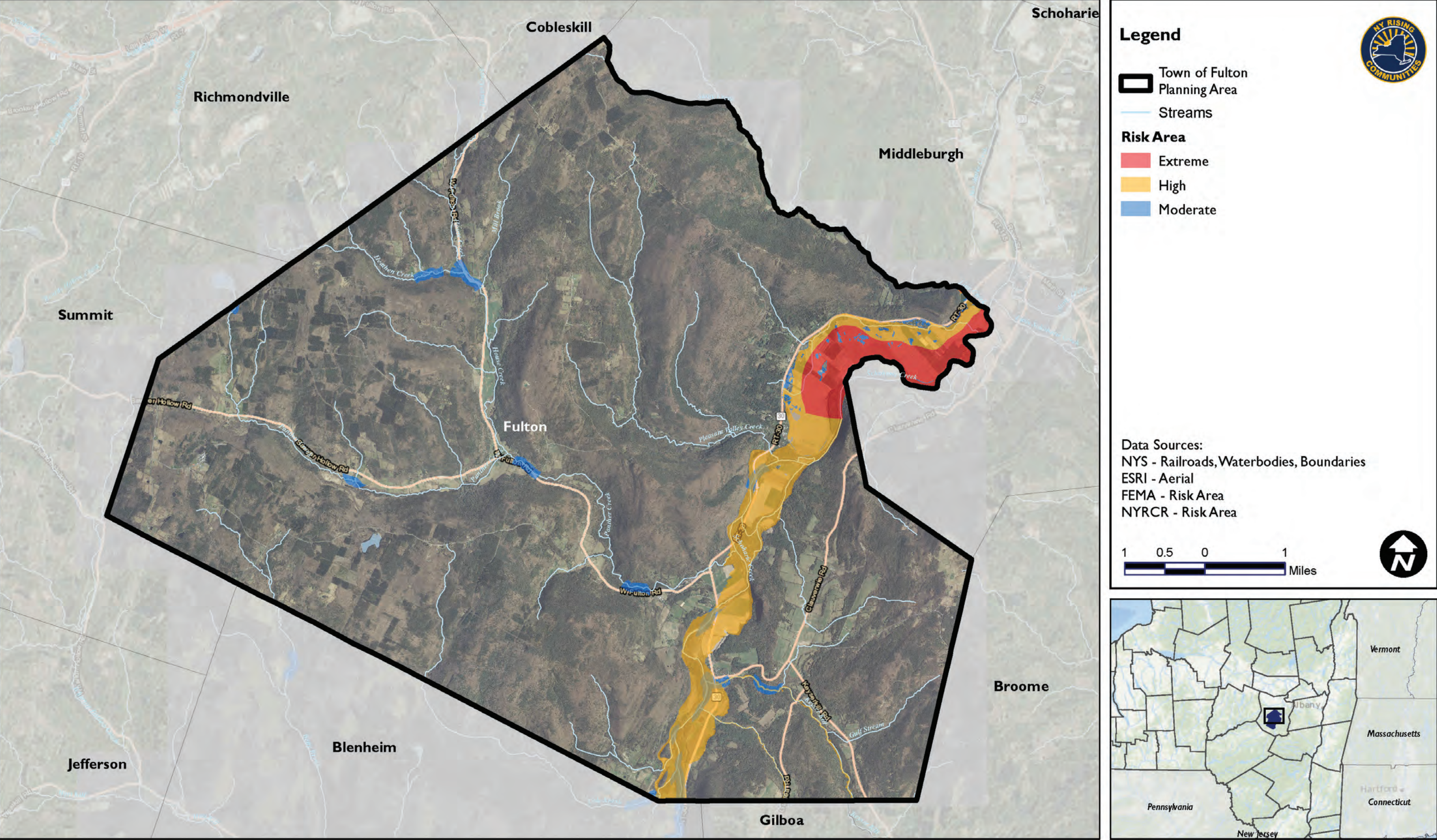
To accurately classify assets in these areas, two additional geographic risk areas were included in the analysis. First, areas within a 1,000-foot radial buffer of a past flood damage location were added. Second, a new detailed layer of streams, creeks, and other minor waterways in the NYRCR Planning Area was used to generate additional risk areas for land within

1,000 feet of those waterways. These two additions to the overall risk area helped the Committee paint an accurate picture of the frequency and likelihood for flood inundation throughout the NYRCR Planning Area, rather than limiting the analysis only to areas within an identified FEMA FHA.

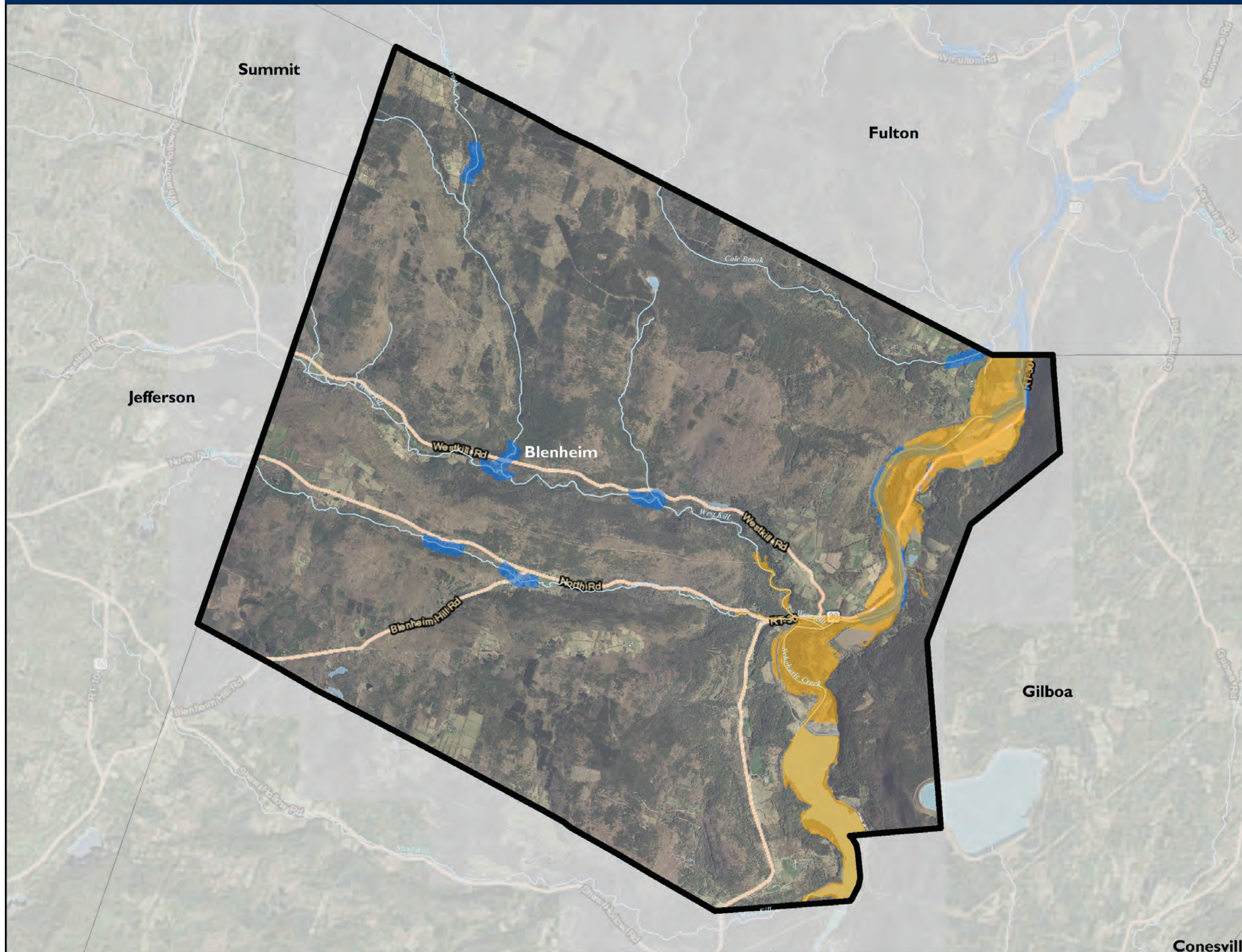
Assets were mapped to determine whether they are located in an area that has been or is likely to be affected by flooding; that information was used to assess their potential flooding risk. Figures 2.2 and 2.3 show the risk areas within the Towns.



NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.2—RISK AREA MAP











*The regional economy, which includes the Towns of Fulton and Blenheim, is predominantly agricultural in nature. Photo of farmhouse is courtesy of Raymond Adams.*

## Description of Community Assets

The following narrative describes the assets identified in the Community by Recovery Support Function (RSF), and provides additional information regarding each group of assets. Figures 2.4 through 2.12 illustrate locations of the assets within the NYRCR Planning Area according to RSFs, and show the defined risk area.

### ECONOMIC ASSETS

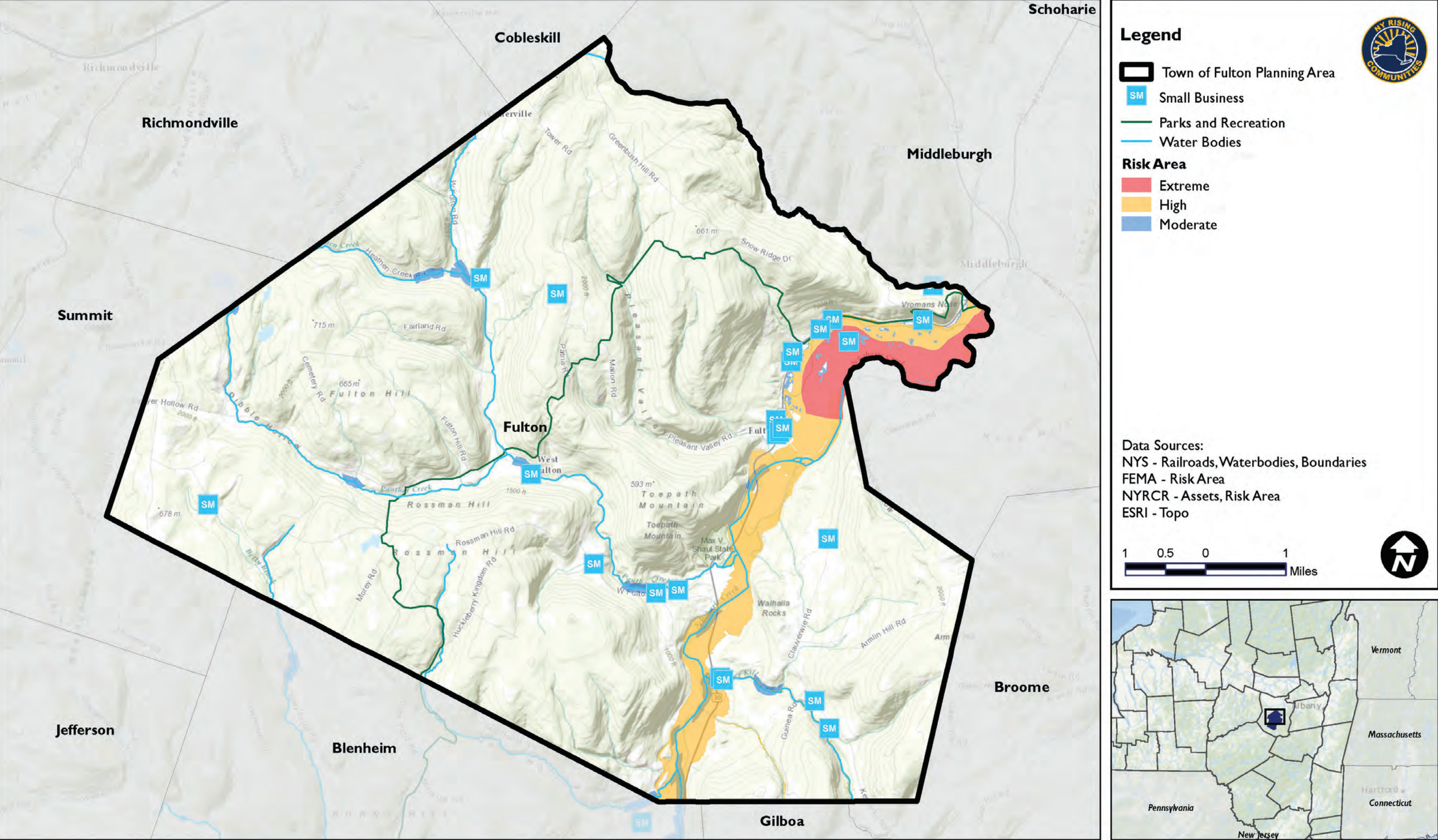
In addition to the agricultural operations that have traditionally been the primary economic section in the region, the Committee identified small businesses as central to the economy of the two Towns. Many of

these businesses can operate just about anywhere but have chosen this Community as their home base. The Committee suggested that the Community is appealing to small business owners because of its rural setting and its proximity to the Capital District.

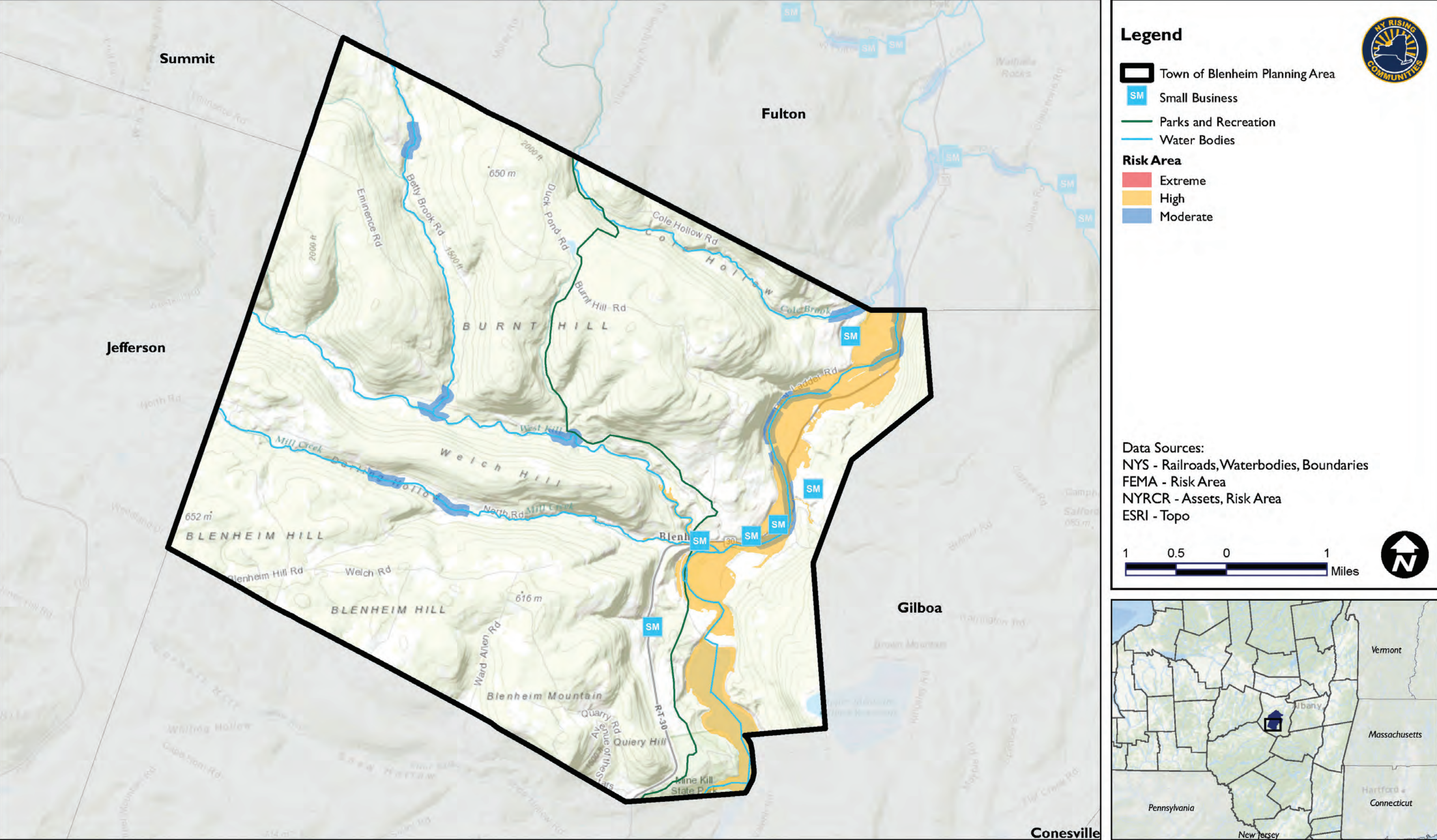
The Committee identified 29 economic assets, including family farms and small businesses, many of which have experienced significant losses in recent years due to both the direct and indirect impacts of flooding. These assets are shown on Figures 2.4 and 2.5. A detailed listing of these assets appears in Section 5: Additional Materials.



NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.4—ECONOMIC ASSETS











## HEALTH AND SOCIAL SERVICES ASSETS

This category includes assets that serve a variety of public functions, from post offices and municipal buildings to fire stations. During flood events, these facilities typically serve as critical disaster response and recovery centers, providing they are accessible.

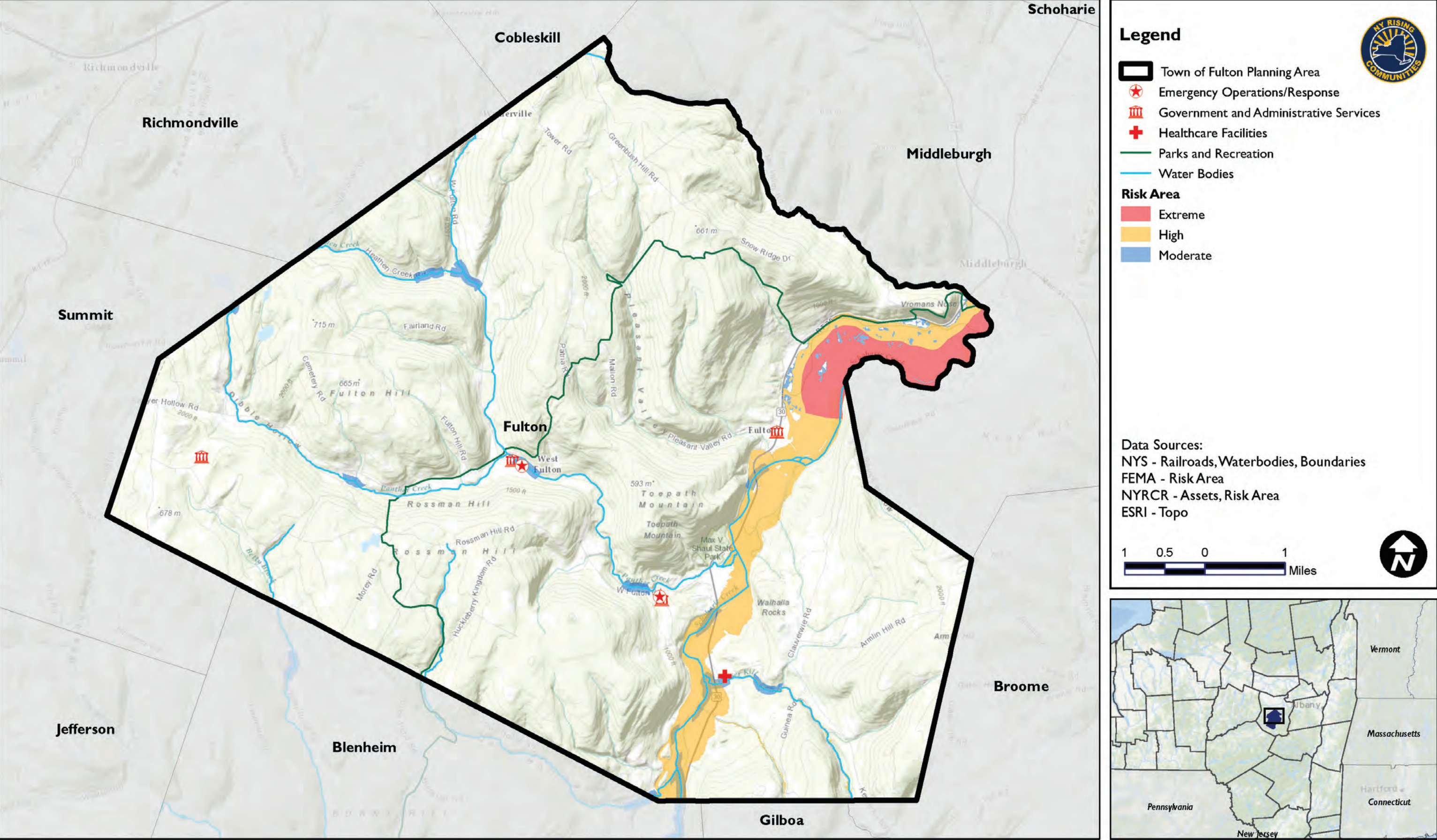
During Hurricane Irene, four feet of floodwater inundated the Blenheim Town Hall/Fire Department/U.S. Post Office building, rendering it useless for Town-related activities. While the Fulton Town Hall was not flooded during Hurricane Irene, dozens of Town staff and other emergency responders—as many as 100 or more by some estimates—crammed into the relatively small office space to manage relief efforts.

The West Fulton Fire Department provided emergency relief throughout the Town, while simultaneously sheltering as many as 100 residents; this is far more than is recommended for temporary housing in that location. In addition, many residents were unable to access services because of road closures. Further, many could not call for help, because telecommunications systems were down and cellular telephone coverage is very limited.

The Committee identified 11 assets in the Health and Social Service category, as shown at Figures 2.7 and 2.8. A detailed listing of these assets appears in Section 5: Additional Materials.

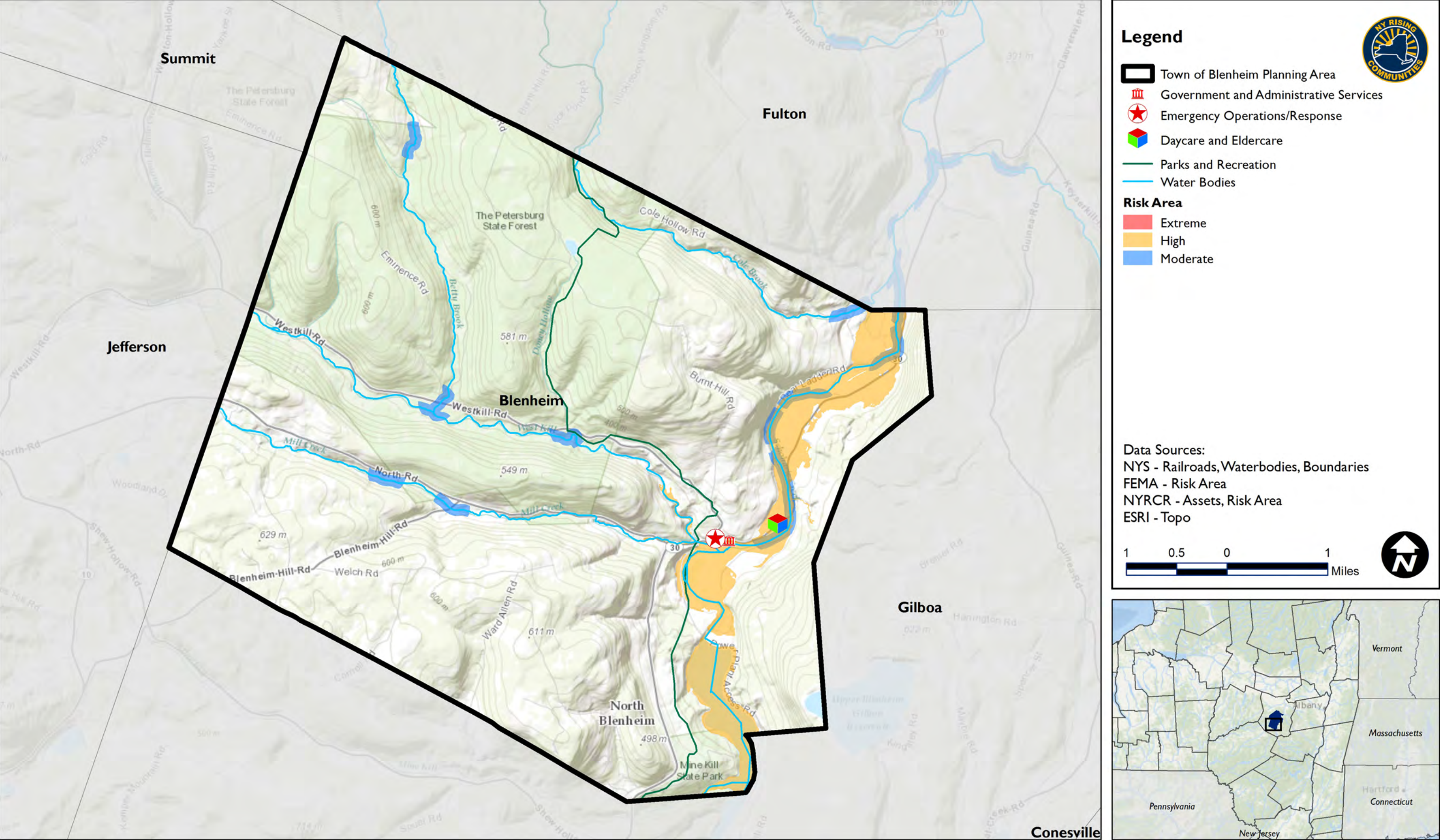


NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.6—HEALTH AND SOCIAL SERVICES





NYRCR: Town of Blenheim, Schoharie County  
FIGURE 2.7—HEALTH AND SOCIAL SERVICES







High floodwaters consumed many streets in Blenheim during Hurricane Irene, including this one in the vicinity of Blenheim Town Hall, which is the blue building in the rear. Photo is courtesy of Melissa Graham.

## INFRASTRUCTURE ASSETS

Infrastructure assets include resources such as roads and bridges, power lines, telecommunications equipment, the propane gas pipeline in the Town of Blenheim, the dam holding back the Lower Reservoir in the Town of Blenheim, and the associated power generation facility.

Hurricane Irene snapped power poles in many locations, leading to major power outages and loss of telephone service throughout Schoharie Valley. Most roads in the Community were closed or connected to a road that was closed, making it difficult or impossible for residents to drive out of the area. Data and first-hand discussions with Committee members and the public indicate that

the NYRCR Planning Area was almost entirely cut off from adjacent towns immediately following Hurricane Irene, especially those living in the valley.

The importance of the Infrastructure Asset category cannot be overstated, as various forms of infrastructure are vital to public safety. Damage to these assets following Hurricane Irene and Tropical Storm Lee was significant. The Committee identified 30 assets in this category, shown at Figures 2.8 and 2.9. A detailed listing of these assets appears in Section 5 of this NYRCR Plan.



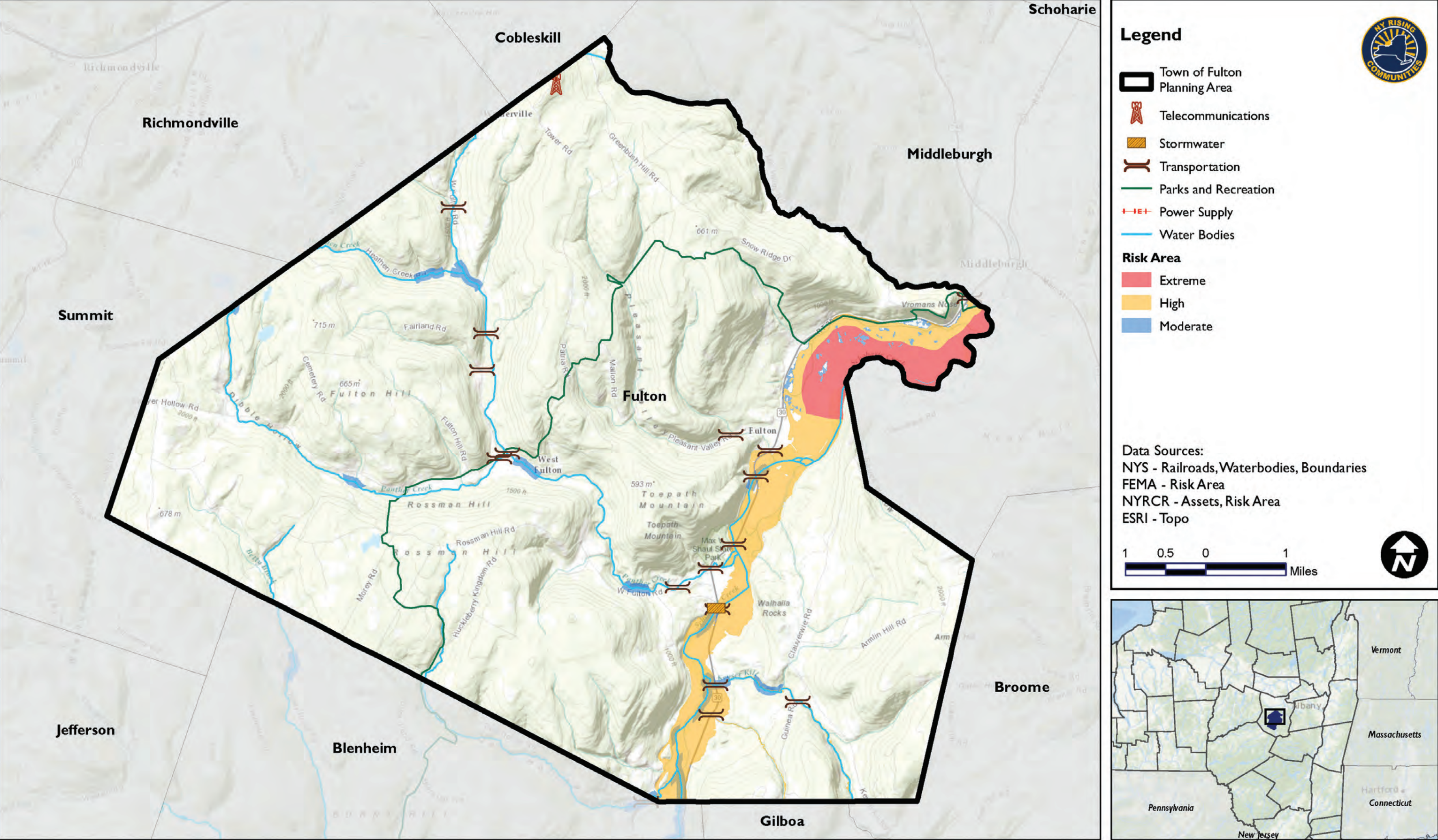
*Fulton Town Hall pictured above is considered a critical facility for emergency operations. Photo is courtesy of Tetra Tech, Inc.*



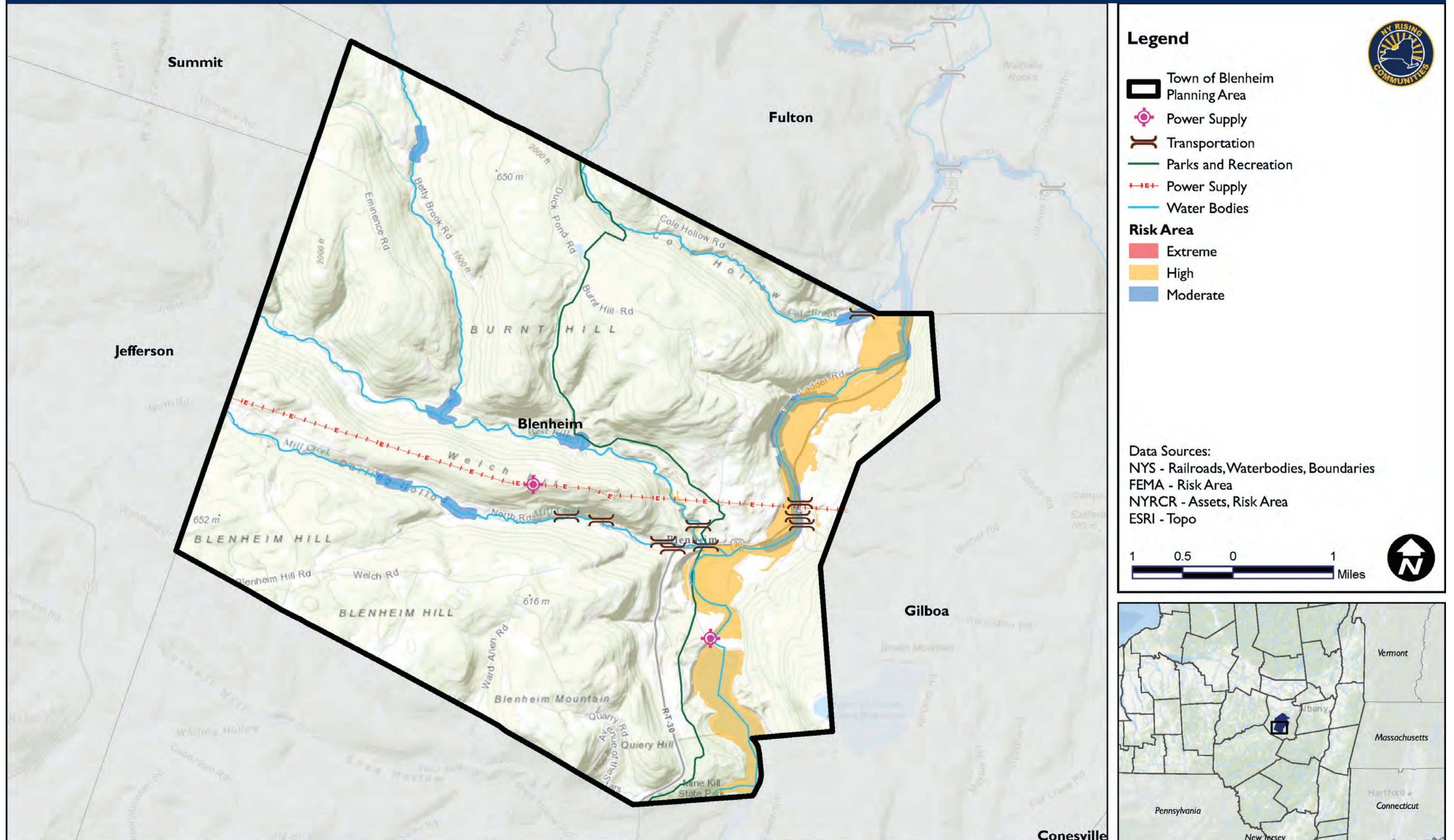
*Pictured here is the bridge from Eastside Road to Route 30 in the Town of Blenheim, with the Old Blenheim Bridge abutments in the foreground. Photo is courtesy of Tetra Tech, Inc.*



NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.8—INFRASTRUCTURE ASSETS











*Pictured above, Blenheim is home to Lansing Manor, an early American country estate built in 1819 by John Lansing, who represented New York as a delegate to the Constitutional Convention in 1787 and the State's Ratification Convention in 1788. Lansing Manor is filled with authentic furnishings from the first half of the 19th century, and is listed on the National Register of Historic Places. Photo is courtesy of Melissa Graham.*

## NATURAL AND CULTURAL RESOURCES ASSETS

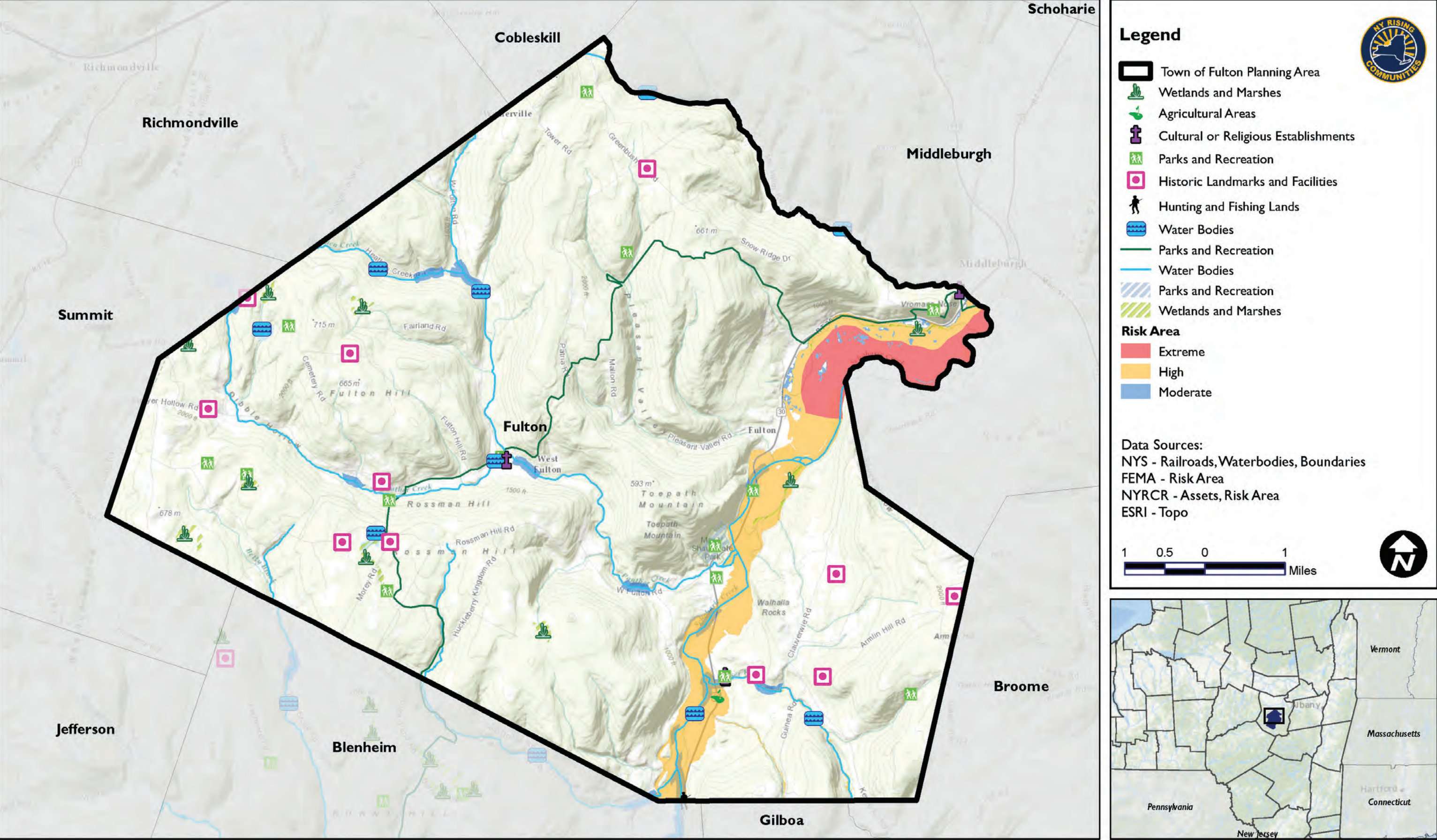
Natural and cultural resources are a vital part of the quality of life and economy of any community, including in the Towns of Fulton and Blenheim. Many types of natural and cultural resources are present in the Towns. There are significant historic properties, historic districts, nationally recognized trails, and other cultural assets that are a critical part of this NYRCR Planning Area's identity.

Many natural and cultural resources, such as agricultural lands, private properties and businesses in historic districts, and parks and recreational areas are in the floodplain of the Schoharie Creek. This puts them at risk from floodwaters or because of the impacts caused by flooding, such as road closures, erosion of land, and loss of power.

The Committee identified 85 assets in the Natural and Cultural Resources Assets category, shown in Figures 2.10 and 2.11. These assets range from historic sites, including those in the North Blenheim and Breakabeen Historic Districts (which also include housing assets, but are identified as natural and cultural resource assets for these purposes); sites listed on the National Register of Historic Places (such as Lansing Manor); historic cemeteries, State parks, and forest land, Vroman's Nose, and the Old Blenheim Bridge, among others. A detailed listing of these important assets appears in Section 5: Additional Materials.

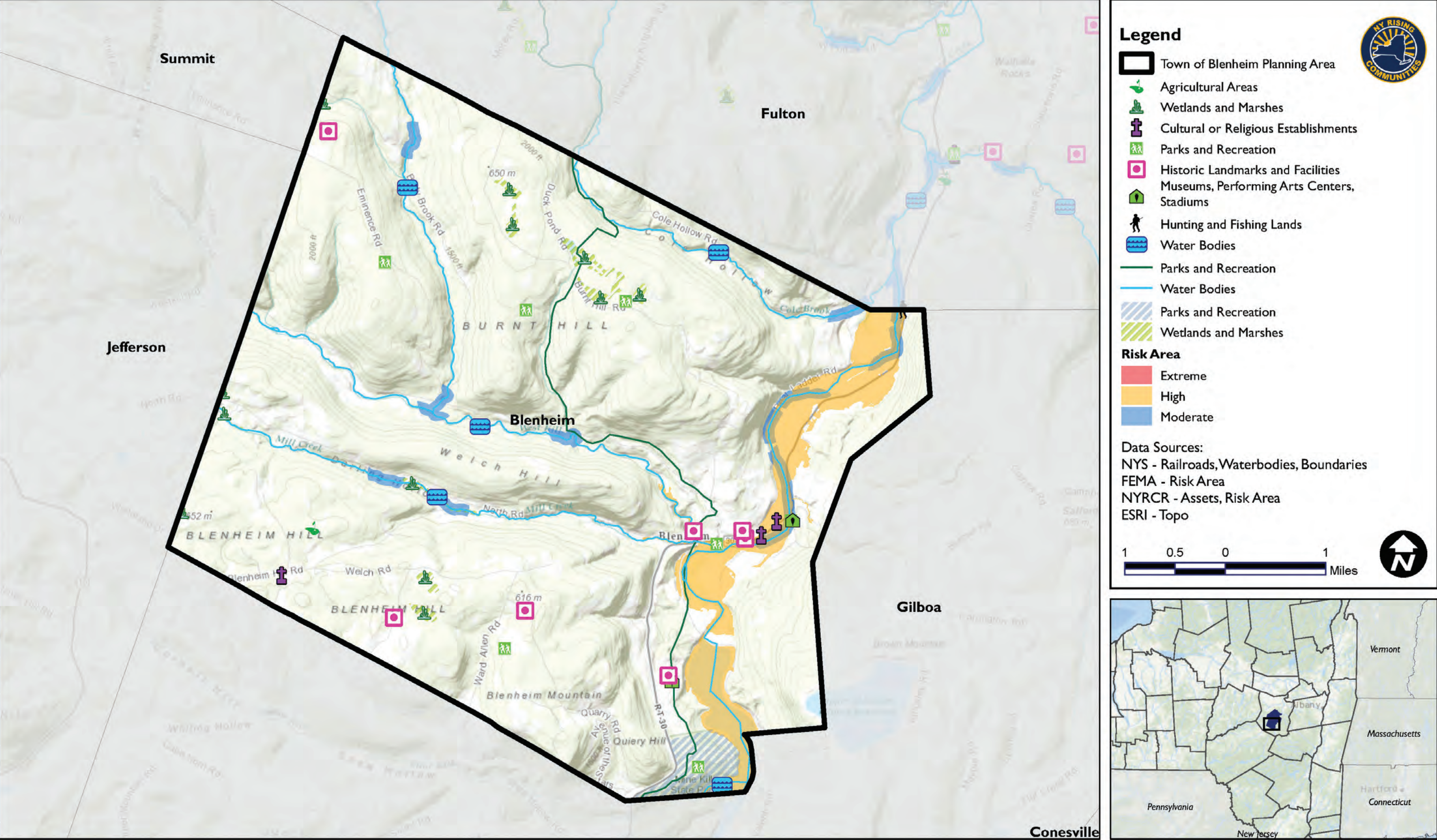


NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.10—NATURAL AND CULTURAL RESOURCE ASSETS





NYRCR: Town of Blenheim, Schoharie County  
FIGURE 2.11—NATURAL AND CULTURAL RESOURCE ASSETS







*Pictured here is the Octagon House. Photo is courtesy of Raymond Adams.*

## HOUSING ASSETS

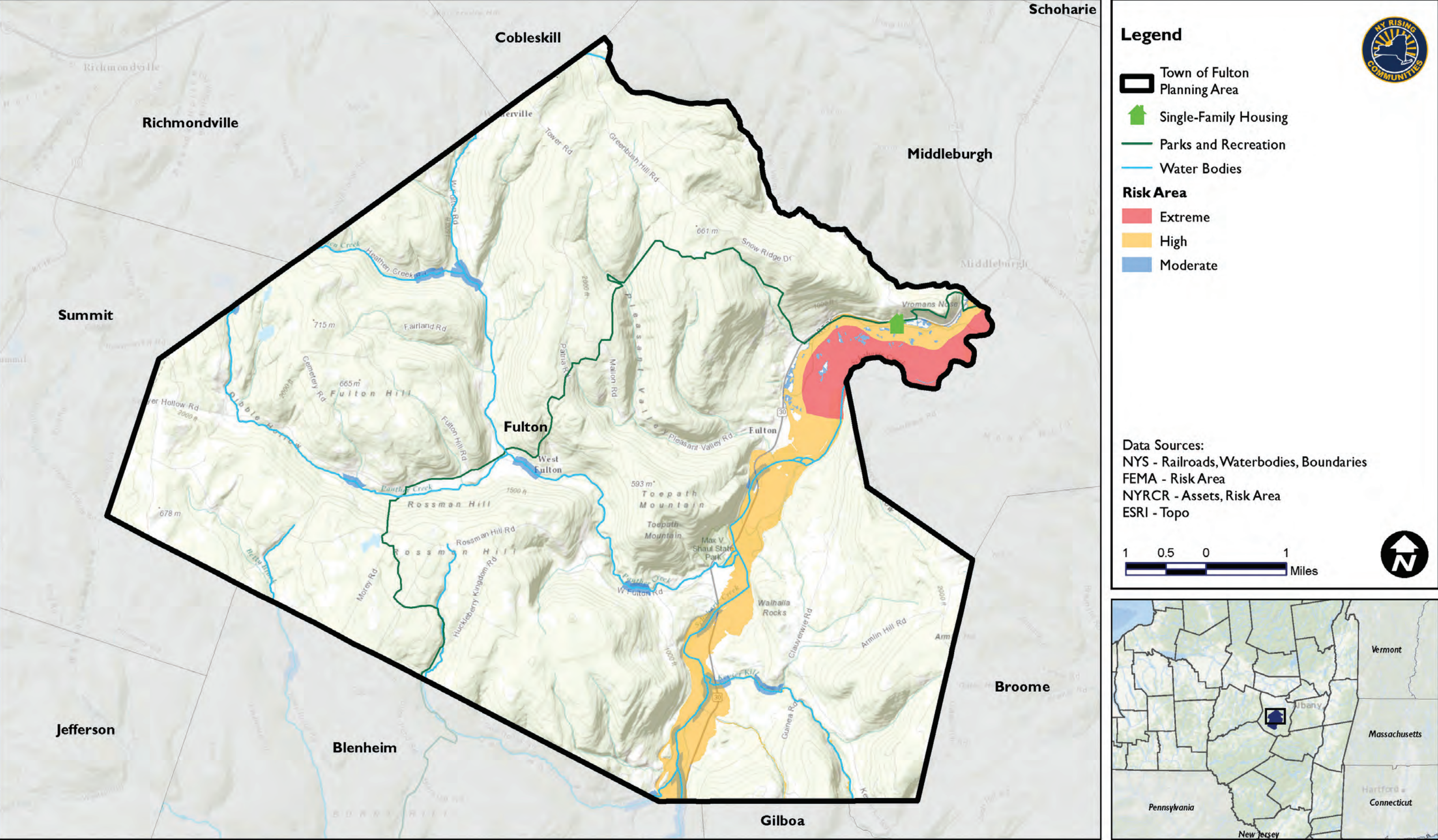
This asset category includes, but is not limited to, single-family, second homes; and multi-family dwellings. In the Community, a single housing asset was identified for inclusion in this category—the Octagon House, shown on Figure 2.12. Other important housing assets within the NorthBlenheim and Breakabeen hamlets are part of the North Blenheim Historic District and the Breakabeen Historic District. These districts (which also includes some businesses in addition to historic homes) are identified as natural and cultural resource assets as discussed previously.

The Community has voiced some concern about the location and age of much of the housing stock because many houses lie within the floodplain and the dam

failure inundation zone. They are typically older and thus more expensive to maintain (older structures typically require more work than newer ones). These structures were built at a time when concerns about flooding (especially during storms like Hurricane Irene) were not as prevalent. Most of these homes have not incorporated resiliency measures and simply fixed or repaired damages. Thus they are more susceptible to damage during major flood events. Discussions with the NYRCR Planning Committee throughout the planning process repeatedly noted there are no known property owners interested in buyouts who have not already begun this process under earlier buy-out program(s).



NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.12—HOUSING ASSETS







## Assessment of Risk to Assets and Systems

The NYRCR Planning Area has suffered repetitive flooding events associated with the Schoharie Creek over the years, including in 1839, 1869, 1903, and 1996, although none as significant as Hurricane Irene in 2011.

**When Irene moved through Schoharie Valley, the rain and runoff raised the level of the Schoharie Creek nearly 20 feet.**

According to accounts from local residents, damages that resulted in the wake of Hurricane Irene and Tropical Storm Lee were compounded by low, regular water flows that have increased the accumulation of sediment and debris, especially behind bridges and spillways. This significantly increased the propensity for flooding. As the Creek's main channel is rather shallow through the Community and is full of rocks and boulders, flood conditions can develop rapidly during periods of heavy rain. Confluences of tributaries and culverts may also affect the flood condition of the Creek. Some explanations for flooding conveyed by the Committee and public include:

- reduced stream capacity (flatter, wider streams);
- the presence of debris and other obstructions;
- streambank erosion due to lost vegetation; and
- unstable slopes on hillsides with clay soils and at "the rocks," an outcropping rock formation along Route 30.

Flood risk to the Community is high, among other reasons because the very factors that enhance flood risk have attracted residents and businesses to the Community—namely the location along NYS Route 30 (running primarily near Schoharie Creek), abundance of level land easy to build upon, and prime soils at those level areas for agricultural uses. An important strategy to increase resiliency of the public infrastructure is to improve mobility and safety in times of disaster and to protect property and infrastructure from future storm damage.

## WHAT THE SCIENCE REVEALED: HYDRAULIC ANALYSIS

To evaluate baseline flooding conditions, a hydraulic analysis was completed for the portion of Schoharie Creek in Blenheim and Fulton, as well as a portion of the Westkill in Blenheim. The Consultant Team used the most recent, effective Hydrologic Engineering Centers River Analysis System (HEC-RAS) data provided the NYS Department of Environmental Conservation (DEC), Bureau of Flood Protection and Dam Safety.

The existing flood conditions were evaluated to understand the extent of inundation from the Schoharie Creek and the effect of specific obstructions. There were two bridges in the HEC-RAS model that were evaluated in the baseline analysis: the Route 30 Bridge over Schoharie Creek in Blenheim; and the Route 30 Bridge over Schoharie Creek, just upstream of Fulton. Neither of these bridges cause significant increases in water surface elevations under flood conditions. The extent of inundation was mapped for both communities and compared to existing Flood Insurance Rate Maps (FIRM) dated April 4, 2004, to validate results.

In addition, a hydraulic analysis compared baseline conditions versus project conditions for several culvert upgrades. The following locations were identified as potential projects:

- Bear Ladder Road;
- Blenheim Hill Road;
- Clauverwie Road;
- Cole Hollow Road;
- Dave Brown Mountain Road; and
- Spur Road.

For potential culvert projects, HEC-RAS models were not available for the tributaries in the NYRCR Planning Area, so an alternative approach was used to evaluate the culverts. The approach used USGS Streamstats to determine the 100-year flow at each culvert, and the Federal Highway Administration's HY-8 Culvert Analysis Program to determine appropriate sizing. During





the analysis, many of the culverts were determined to be undersized and the HY-8 program was used to determine minimum cross-sectional areas.

### **FLOODPLAIN VS. FLOODWAY**

*A **floodplain** is defined as the low lands adjoining the channel of a river, stream, or watercourse, or adjoining the shore of an ocean, lake, or other body of standing water, which have been inundated by flood water. Floodplains are further categorized by the frequency of flooding. Most often, floodplains are referred to as 100-year floodplains.*

*A **regulatory floodway** refers to the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure there are no increases in upstream flood elevations.*

## **DESCRIPTION OF METHODOLOGY**

Based on feedback from the public and the NYRCR Planning Committee, and in conjunction with information captured by the asset inventory, risks to the Towns' assets were assessed by using the NYS DOS-provided Risk Assessment Tool. The Risk Assessment Tool is designed to assess and quantify risk to individual community assets through built-in formulas that calculate an overall risk score category based on three factors: hazard, exposure, and vulnerability. The Risk Assessment Tool calculates a score for each factor and combines them to represent the risk of each asset in the community relative to one another.

The Risk Assessment Tool calculation combines scores for the three factors, using the following formula:  
 $\text{Hazard} \times \text{Exposure} \times \text{Vulnerability} = \text{Risk}$ .

Each factor in this equation is calculated automatically, based on appropriate inputs, and is assigned as follows:

- **HAZARD SCORE** is assigned for each asset based on a 100-year storm event occurring in the next 100 years.

- **EXPOSURE SCORE** is determined by the risk area where the asset is located, and local landscape attributes that influence the potential for storm impacts. This score reflects how landscape features can moderate damage to individual assets.
- **VULNERABILITY SCORE** reflects the level of impairment or consequences that assets may undergo from a hazard event, and reflects the ability of the asset to resist damage from the hazard.

## **INTERPRETATION OF RISK**

Risk scores help to identify assets with an elevated potential for storm damage. Some factors that could be considered for each asset in developing a community risk management strategy include:

- contribution to life safety;
- whether the asset is a critical facility;
- value of the asset;
- environmental services provided;
- economic contribution of the asset;
- whether alternatives are available; and
- capacity of the asset to adapt.

### **100-YEAR FLOODPLAIN**

*A **100-year floodplain** (or 1% annual chance floodplain) can be described as a bag of 100 marbles, with 99 clear marbles and one black marble. Every time a marble is pulled out from the bag, and it is the black marble, it represents a 100-year flood event. The marble is then placed back into the bag and shaken up again before another marble is drawn. It is possible that the black marble can be picked two or three times in a row, demonstrating that a 100-year flood event could occur several times in a row. (Interagency Floodplain Management Review Committee.)*



The Consultant Team evaluated risks from both a 100 year storm (1% annual chance) and a 500-year event (0.2% annual chance), which represent higher-intensity storm events. Risk was calculated for each asset, resulting in categorization in one of four categories: severe; high; moderate; residual.

### Severe Category

Both exposure and vulnerability could be reduced for assets in this category, if possible. Relocation of these assets could be considered a priority.

### High Category

Risk scores in this category indicate conditions that could lead to significant negative outcomes from a storm. Actions could be taken to reduce vulnerability, such as elevating or flood-proofing the asset to help avoid long-term loss of function.

### Moderate Category

Risk scores in this category pose moderate-to-serious consequences, but adaptation may be a lower priority based on exposure, or because vulnerability remains relatively low. Consideration of a combination of measures is recommended to reduce exposure or vulnerability.

### Residual Category

Risk scores in the residual category occur for an asset outside of an identified risk area and whose exposure and vulnerability are relatively low. This situation suggests floods would pose minor or infrequent consequences. Note that risk is never completely eliminated; some residual risk still remains, even after management measures have been implemented. Monitoring conditions and adapting, as necessary, are recommended.

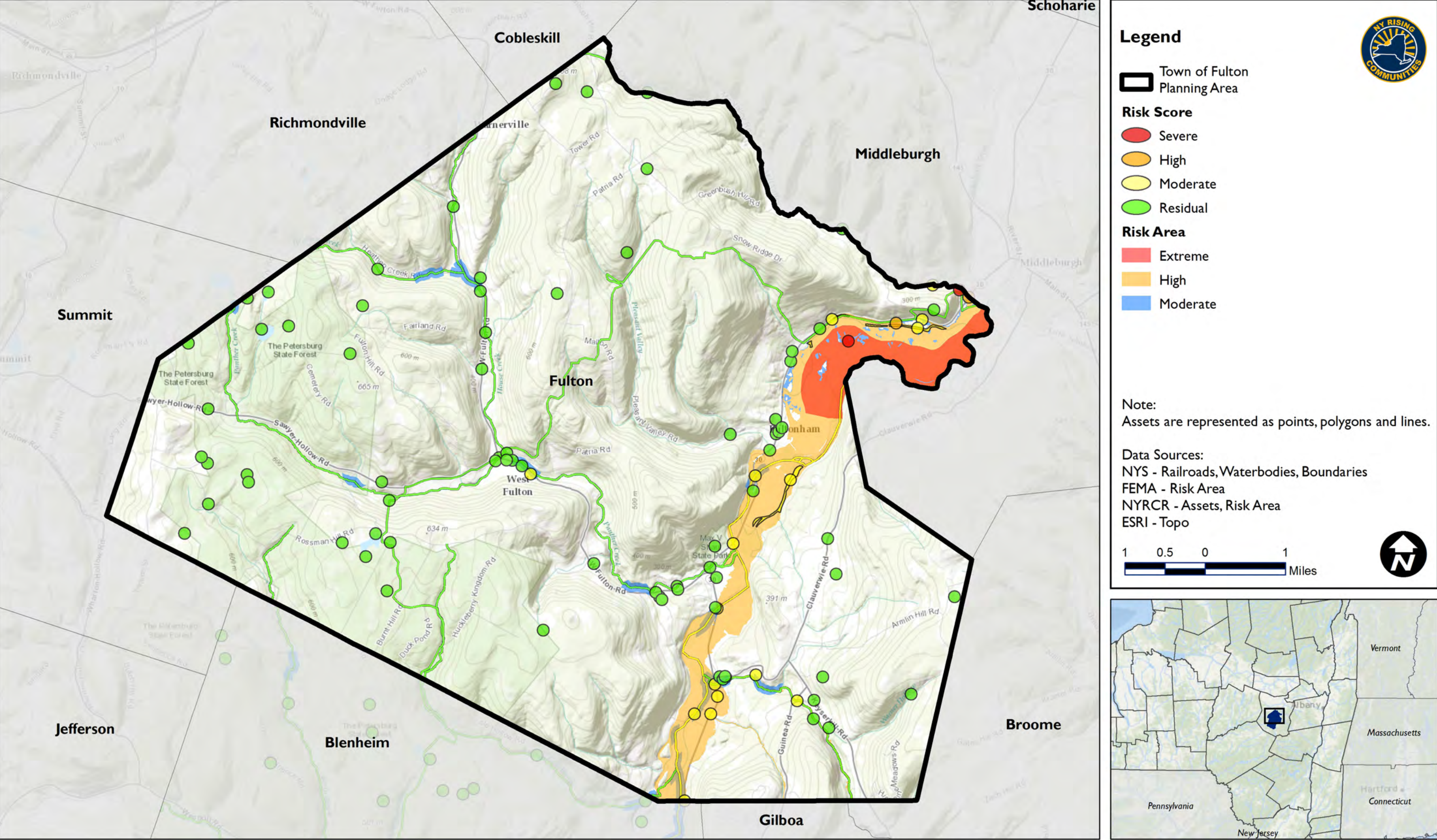
## Assessment Results

As previously discussed, no risk scores were generated for assets outside of an identified risk area. Figures 2.13 and 2.14 show the geographic distribution of risk scores for a 100-year storm event in the NYRCR Plan Area. A detailed breakdown showing each identified asset in the NYRCR Plan Area and associated risk assessment data appear in Section 5 of this document.

As shown at Figures 2.13 and 2.14, a total of 10 assets with severe or high risk scores were identified during a 100-year event. The assets with the highest risk scores are: St. Paul's Episcopal Church; Wilderhook Syrup in Fultonham; the Blenheim Town Hall/Fire Department/Post Office; the bridge crossing over Line Creek; Head Start Child Development in North Blenheim; the Methodist Church and Old Presbyterian Church in North Blenheim; the North Blenheim Historic District; and the Octagon House in Fultonham.

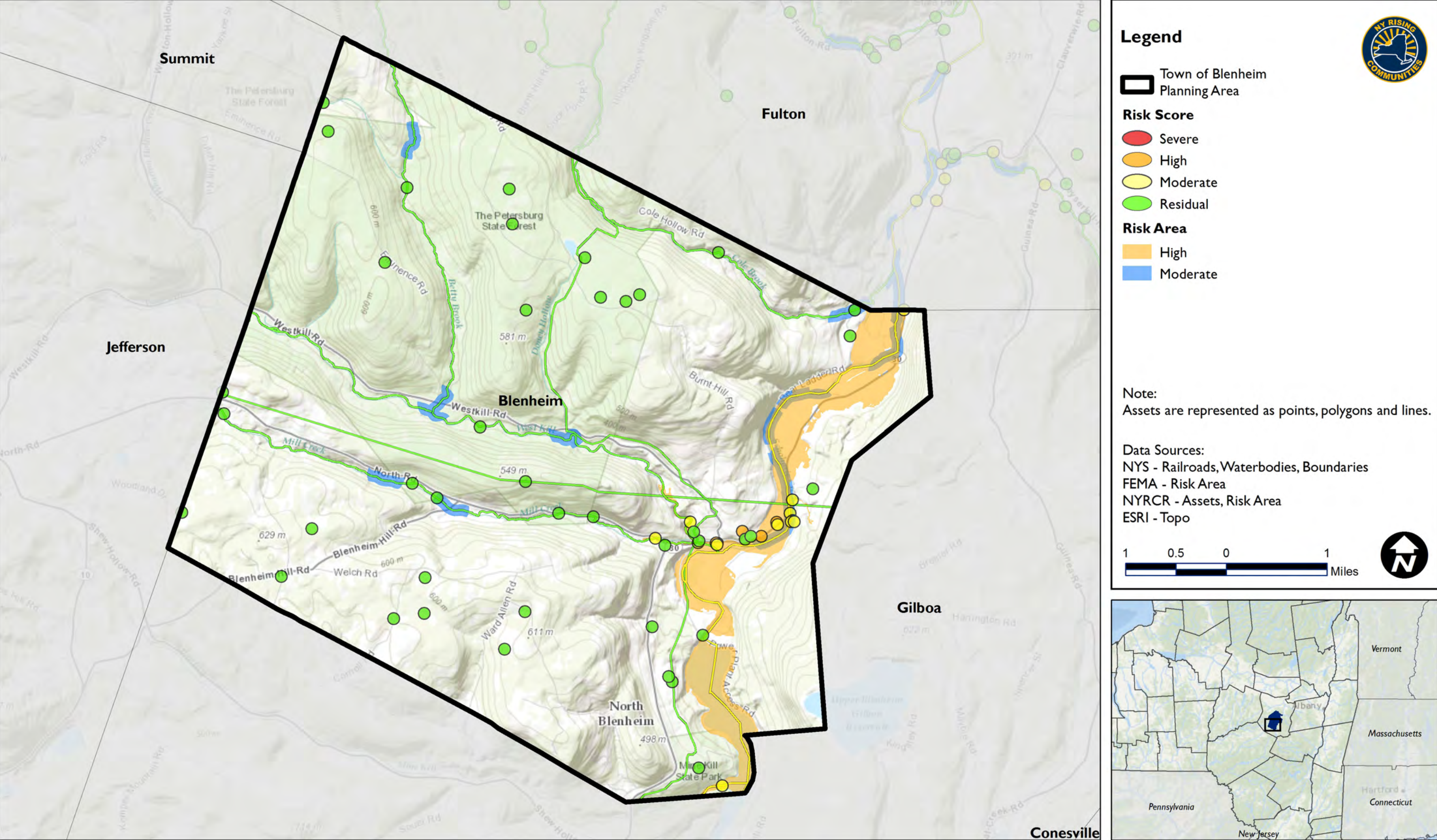


NYRCR: Town of Fulton, Schoharie County  
FIGURE 2.13—RISK SCORE MAP





NYRCR: Town of Blenheim, Schoharie County  
FIGURE 2.14—RISK SCORE MAP







## ECONOMIC ASSETS

The risk assessments revealed that a number of the Towns' economic assets are at risk from flooding. One asset was identified at severe risk; four assets were identified at moderate risk; and two assets were identified at residual risk during a 100-year event. A number of the businesses and facilities in the Towns have been routinely affected by flood events to some degree, especially Hurricane Irene.

The risk scores for the Towns' economic assets are listed in Table 2.2. The economic assets regarded as most vulnerable and exposed to flooding in the Towns could be considered for flood mitigation actions. Other buildings on properties listed in Table 2.2 could be considered for prioritization for flood-proofing or other mitigation measures.

**TABLE 2.2 – ECONOMIC ASSETS**

Asset/Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Wilderhook Syrup	Small Business	Severe	Severe
Bohringer's Fruit Farm	Small Business	Moderate	Moderate
Frank Lacko Farm	Small Business	Moderate	Moderate
L&L Logging	Small Business	Moderate	Moderate
McKenna Machine Shop	Small Business	Moderate	Moderate
Under the Nose, MyMobile, Q Modeling Mill Valley Road	Small Business	Moderate	Moderate
23 Small Business Establishments	Small Business	Residual	Residual

Source: NYS DOS (2014)



## HEALTH AND SOCIAL SERVICES ASSETS

The risk assessments revealed that several of the Towns' health and social services assets are at risk from flooding. Three assets were identified as being at severe risk from flooding, while an additional three were identified as being at residual risk from flooding during a 100-year flooding event.

This analysis reflects information provided by the public and the Committee. A number of the most recognizable and utilized assets in the Towns have been routinely affected by flood events and were significantly impacted during Hurricane Irene; some structures were inundated by several feet of water. Table 2.3 lists risk scores for the Towns' Health and Social Services assets.

To reduce future flood damages and losses to these assets, mitigation actions to reduce both vulnerability and exposure can be considered. Buildings and facilities most vulnerable and exposed to flooding in the Towns could potentially be considered for relocation or, at least, site/building protective and resiliency measures.

The key asset in Blenheim—the Blenheim Town Hall/Fire Department/U.S. Post Office facility—is at high risk from flooding. The Breakabeen Food Pantry and several other government and administrative service properties and emergency operations response entities are also at risk of residual effects from flooding. These facilities and other structures that cannot be relocated can be considered for flood-proofing or other resiliency and mitigation measures to reduce the potential for catastrophic damage in future flood events.

**TABLE 2.3 – HEALTH AND SOCIAL SERVICE ASSETS**

Asset/Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Fire Department of Blenheim	Emergency Operations/Response	High	High
Head Start Child Development	Daycare and Eldercare	High	High
Town Hall of Blenheim	Emergency Operations/Response	High	High
US Post Office—North Blenheim	Government and Administrative Services	High	High
Breakabeen Food Pantry	Healthcare Facilities	Residual	Residual
Four Government and Administrative Services Entities	Government and Administrative Services	Residual	Residual
Two Emergency Operations Response Entities	Emergency Operations/Response	Residual	Residual

Source: NYS DOS (2014)





## INFRASTRUCTURE ASSETS

The risk assessments identified the Bridge Crossing over Line Creek at high risk from flooding during a 100-year flooding event, while many others were identified as moderate or residual risk. Table 2.4 lists risk scores for infrastructure assets in the Towns. These scores reflect information provided by the public and the Committee.

Although the number of assets listed in Table 2.4 seems somewhat small for these Towns, the effects of flooding to these assets are exceptional, as they impact everyday

activities of residents, government and administrative services, and emergency response operations.

According to the methodology for risk assessment, mitigation actions should reduce both vulnerability and exposure of assets. Facilities most vulnerable and exposed to flooding in the NYRCR Planning Area could be considered for upgrades. For infrastructure that cannot be moved, or for which movement is not feasible for whatever reason, mitigation actions, such as flood-proofing, could be considered.

**TABLE 2.4 – INFRASTRUCTURE ASSETS**

Asset/Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Bridge Crossing Line Creek	Transportation	High	High
Bridge Crossing Bear Ladder Road Cole Hollow Brook	Transportation	Moderate	Moderate
Bridge Crossing Brn Schoharie Creek	Transportation	Moderate	Moderate
Bridge Crossing Creamery Road West Kill Creek	Transportation	Moderate	Moderate
Bridge Crossing County Road 2 Mill Creek - 1.5 Miles of North Blenheim	Transportation	Moderate	Moderate
Bridge Crossing County Road 53 Keyserkill Creek	Transportation	Moderate	Moderate
Bridge Crossing Devils Run	Transportation	Moderate	Moderate
Bridge Crossing Keyserkill Creek	Transportation	Moderate	Moderate
Bridge Crossing Schoharie Creek - 9.1 Miles NE of Delaware CL	Transportation	Moderate	Moderate
Bridge Crossing Schoharie Creek - 5 Miles SW of 30/145	Transportation	Moderate	Moderate
Bridge Crossing Schoharie Creek - 6.0 Miles SW of 30/145	Transportation	Moderate	Moderate
Bridge Crossing Schoharie Creek - 9.9 Miles SW of 30/145	Transportation	Moderate	Moderate
Bridge Crossing at West Kill Creek	Transportation	Moderate	Moderate
12 Transportation Entities	Transportation	Residual	Residual
Blenheim-Gilboa Pumped Power Storage Project	Power Supply	Residual	Residual
Gauge BKBN6 (Schoharie Creek Gauge)	Stormwater	Residual	Residual
One Power Supply Entity	Power Supply	Residual	Residual
Petersburg Mountain Radio Facility	Telecommunications	Residual	Residual

Source: NYS DOS (2014)



## NATURAL AND CULTURAL RESOURCES ASSETS

Many natural and cultural resources assets have been routinely affected by flood events, especially those associated with Hurricane Irene and the remnants of Tropical Storm Lee. One of these assets was identified as being at severe risk, and three assets were identified as being at high risk of flooding during a 100-year flooding event. Of the remaining 17 assets, nine are at moderate risk, and eight are at residual risk from flooding during

a 100-year flooding event. Table 2.5 lists risk scores for the Towns' Natural and Cultural Resources assets. These scores reflect information provided by the public and the Committee.

Buildings and facilities listed as the most vulnerable and exposed to flooding in Table 2.5 are the most important to consider for flood-proofing or other mitigation actions.

**TABLE 2.5 – NATURAL AND CULTURAL RESOURCE ASSETS**

Asset/Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
St. Paul's Episcopal Church	Cultural or Religious Establishments	Severe	Severe
Methodist Church	Cultural or Religious Establishments	High	High
North Blenheim Historic District	Historic Landmarks and Facilities	High	High
Old Presbyterian Church	Cultural or Religious Establishments	High	High
Ball Field, NYS Route 30, Breakabeen	Agricultural Areas	Moderate	Moderate
Blenheim Covered Bridge and Park	Parks and Recreation	Moderate	Moderate
Blenheim Town Hall Park	Parks and Recreation	Moderate	Moderate
Breakabeen Cemetery Association	Historic Landmarks and Facilities	Moderate	Moderate
Mine Kill	Water Bodies	Moderate	Moderate
North Blenheim Fishing Access	Hunting and Fishing Lands	Moderate	Moderate
Schoharie Creek	Water Bodies	Moderate	Moderate
Schoolhouse Museum	Museums, Performing Arts Centers, and Stadiums	Moderate	Moderate
Two Wetlands and Marshes	Wetlands and Marshes	Moderate	Moderate
15 Historic Landmarks and Facilities	Historic Landmarks and Facilities	Residual	Residual
19 Parks and Recreation Establishments	Parks and Recreation	Residual	Residual
12 Water Bodies	Water Bodies	Residual	Residual
19 Wetlands and Marshes	Wetlands and Marshes	Residual	Residual
Blenheim-Gilboa Visitors Center	Museums, Performing Arts Centers, and Stadiums	Residual	Residual
Blenheim Hill Farm	Agricultural Areas	Residual	Residual
Four Cultural or Religious Establishments	Cultural or Religious Establishments	Residual	Residual
Lansing Manor House	Historic Landmarks and Facilities	Residual	Residual

Source: NYS DOS (2014)





HOUSING ASSETS

Based on information provided by the public and the Committee, one housing asset was identified as being at high risk from flooding during a 100-year flooding event—the Octagon House. The North Blenheim and Breakabeen Historic Districts are also housing assets, but have been identified as natural and cultural

resources assets in this NYRCR Plan. Table 2.6 lists the risk score for the Octagon House. Given the uniqueness and historic value of this structure as an example of a rarely seen housing type, flood-proofing or other mitigation measures to reduce both vulnerability and exposure could be valuable to protect this asset.

TABLE 2.6 – HOUSING ASSETS			
Asset/Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Octagon House	Single-family Housing	High	High

Source: NYS DOS (2014)

# Assessment of Needs and Opportunities

## Community Planning and Capacity Building

Community planning systems in the Towns were strained during floods caused by Hurricane Irene, Tropical Storm Lee, and subsequent storms, in many cases, testing the limits of resiliency and the capabilities of disaster response. Undertaking additional emergency planning and preparedness should help the Towns prepare for future flooding events. Public awareness campaigns and better coordination among agencies should further these aims, and could lead to designations of shelters at key locations throughout the Towns.

Both Towns are in the FEMA National Flood Insurance Program (NFIP) and have enacted flood damage protection ordinances. In the long term, the Towns could consider flood mitigation measures that may reduce vulnerability and ultimately, may reduce flood insurance costs.

Table 2.7 lists needs and opportunities associated with the Community Planning and Capacity Building RSF.

TABLE 2.7 – RECOVERY SUPPORT FUNCTION OF COMMUNITY PLANNING AND CAPACITY BUILDING	
This Recovery Support Function addresses the Towns’ ability to implement storm recovery activities and to plan for ways to mitigate effects of future storms.	
Needs	Opportunities
Better understanding of potential shelter locations and the need for each to remain open and independent in the event of a prolonged emergency.	Designate shelters based upon local resident knowledge.
Better public information regarding evacuation routes, shelter locations, and how to shelter-in-place to inform and prepare residents for hazard events.	Coordinate public information administration on a regional basis.
Better understanding of current capacities, needs, and concerns regarding Schoharie Creek during high-water and major flood events.	Utilize information regarding creeks and streams to better prepare for future storm events.
Better coordination of emergency evacuation procedures and preparedness among agencies.	Utilize local knowledge to improve coordination.
Affordable flood insurance.	Investigate opportunities to reduce flood insurance premiums.





## Economic Development

Ensuring that businesses remain operational and successful is essential to the Towns' ability to recover from the storm events of 2011 and potential large storms in the future. Hurricane Irene inundated businesses with floodwater and knocked many out of operation, resulting in downtime that ranged from days to months.

Capitalizing on the NYRCR Planning Area's key economic assets could help to foster economic development. Support of the farming community through protection of agricultural soils could also ensure continued success of these important economic assets.

Table 2.8 lists needs and opportunities associated with the Economic Development RSF.



*Agriculture plays an important role in the economy of the NYRCR Planning Area. Photo of corn field is courtesy of Melissa Graham.*

**TABLE 2.8 – RECOVERY SUPPORT FUNCTION OF ECONOMIC DEVELOPMENT**

Description	
The primary economic concern after a disaster is returning economic and business activities to a state of health. Recovery periods offer unique opportunities to develop new economic strengths that result in a more sustainable and economically robust community. Communities that design an economic development strategy are more likely to capitalize on opportunities for economic improvement, such as those offered through recovery initiatives, such as the NYRCR Program.	
Needs	Opportunities
Better define historic districts and main street areas to promote economic development and new business opportunities.	Improve infrastructure, streetscaping, and walkability of these districts and areas to help entice businesses to locate therein.
Study and understand economic challenges and opportunities in the Towns.	Assess potential development of a small business incubator, develop a marketing and tourism strategy, and create awareness of business in the Towns.
Understand impacts on agricultural land from flooding by the Schoharie Creek.	Interview property owners and review official documents to assess impacts of flooding from Hurricane Irene and other recent large storms to inform future investments and to develop flood mitigation strategies.
Implement regional, collaborative, comprehensive tourism efforts.	Provide more opportunities for residents to sell their agricultural and artisan goods.
Businesses need high-speed Internet and Wi-Fi services to grow.	Provide public Wi-Fi to expand coverage to other areas in the Towns.
Evaluate needs for basic goods and services in the Towns and/or in the region.	Work with regional communities to develop additional locations to provide needed goods and services.



## Health and Social Services

Flooding associated with Hurricane Irene and Tropical Storm Lee, past large storms, and snowmelt has led to structural damage to private properties, roadways, and agricultural resources in the floodplain of Schoharie Creek, and in the valleys into which water rushes from the mountains.

Flood-related storms, snowstorms, and ice storms, snowmelt events, and high winds create significant potential for downed trees and power lines, which can cause widespread power outages throughout the Towns. Significant vulnerabilities resulting from these interruptions pertain to a number of needs and opportunities the Committee identified. Table 2.9 lists needs and opportunities associated with the Health and Social Services RSF.

**TABLE 2.9 – RECOVERY SUPPORT FUNCTION OF HEALTH AND SOCIAL SERVICES**

Description	
After a disaster, one of the more immediate considerations is whether public health, health care facilities, and essential social services needs have been restored. Transportation infrastructure failures and interruptions of access are the main hindrances to providing basic care at a level equal to that outside of flood-impacted areas.	
Needs	Opportunities
Rapid restoration of critical services that are lacking including healthcare, transportation, and senior services.	Invest in planning and flood mitigation efforts to eliminate/reduce impacts and rapidly restore services.
Emergency first-aid and basic life support assistance.	Create emergency services in the Towns that can provide emergency first-aid and basic life support while residents await more advanced life support assistance.
For critical facilities, increases of resiliency and, if appropriate and feasible, relocations.	Explore locations where resiliency measures are needed and those where relocations may be warranted.
Access to clean water for some residents.	Create a filtration system/holding tank to hold water for emergency situations. Ensure that wells are separated from septic systems.
Identification of residents who may need extra assistance during flooding events or evacuations.	Work to encourage residents to complete the existing Schoharie County special needs registry.
Evaluation of emergency shelter needs and locations.	Ensure that basic necessities are available at shelter locations including generators, water, food, clothing, blankets, shower, and laundry facilities.
Evaluation of emergency responder needs.	Explore options to purchase needed EOC, disaster preparedness and response, and debris removal equipment such as generators, blankets/cots and heavy equipment and identify needs based on known problem(s)/ problem locations.





Housing

There are many different types of housing in the NYRCR Planning Area, including those on the hillsides, in low-lying areas, as well as in upland areas. There are two primary housing-related issues that were discussed by the Committee: affordability and flood potential. Many homes in the Towns are vulnerable, particularly those located along the Schoharie Valley floor and in proximity to the Schoharie Creek. In addition, some homes located in the hills along creeks and streams are prone to extensive flood damage, particularly those where the natural slope of the land or the design of roads become inundated during major storm events. While some

homes have been bought out, the Committee believes there are few, if any, additional homeowners in the Towns who are interested in participating in a buy-out.

An estimated 228 residents in the Towns live in the 1% annual chance flood area (100-year floodplain). This number does not include residents affected by access and other service interruptions due to flooding, and does not account for instances of multiple structures present on a single parcel.

Table 2.10 lists needs and opportunities associated with the Housing RSF.

TABLE 2.10 – RECOVERY SUPPORT FUNCTION OF HOUSING

Description	
The primary economic concern after a disaster is returning economic and business activities to a state of health. Recovery periods offer unique opportunities for developing new economic strengths that result in a more sustainable and economically robust community. Communities that strategically design an economic development strategy and support these elements in their planning process are more likely to capitalize on opportunities for economic improvement, such as those offered through recovery programs like NYRCR.	
Needs	Opportunities
Assistance to local homeowners who are still looking to repair or rebuild from the storm.	Utilize currently available NY Rising programs in addition to other county, state, and Federal programs.
Increase of resiliency to future storms of the housing stock in the Towns.	Consider strategic property acquisitions through buy-out programs. Undertake flood proofing or elevation of flood-prone properties.



Pictured above downed power lines across streets caused serious traffic and accessibility issues throughout the Towns in the wake of Hurricane Irene. Photo is courtesy of Keith Graham.



## Infrastructure

The Towns have a history of incurring infrastructure damage from severe storms, especially during flooding events. Hurricane Irene and Tropical Storm Lee demonstrated the potential for massive destruction. The Schoharie Creek and other small streams exceeded their banks and surged through the Towns, covering roads with raging floodwaters and cutting off evacuation and rescue pathways. Compromised or inadequate telecommunications infrastructure inhibited the ability for people to call for help or to connect with loved ones during and after the storm. In many cases, the safety and integrity of roads and utility systems were of greatest concern to residents during and after Irene.

Many of the primary ingress and egress routes in the Community, including NYS Route 30, have undergone repetitive flooding. However, the flooding caused by this storm was massive and stranded many people in their homes or neighborhoods. Many residents were isolated in their homes for days in the wake of Irene. Moreover, residents were without power for extended periods. Table 2.11 lists needs and opportunities associated with the Infrastructure RSF.

**TABLE 2.11 – RECOVERY SUPPORT FUNCTION OF INFRASTRUCTURE**

Description	
Much of the critical infrastructure in the Towns was impassable or closed during the flooding caused by Hurricane Irene. Transportation interruptions, breakdowns in communication networks, and damages to response equipment impacted ability to adequately respond. Rebuilding infrastructure with increased resilience is critical for improving the Towns' capacity to respond to future disasters.	
Needs	Opportunities
Lower-cost energy and more sustainable and resilient, environmentally friendly power options.	Investigate potential to develop large-scale renewable energy source projects such as solar microgrids, and work with New York Power Authority (NYPA) to investigate any potential reduced power options.
Improved cellular phone and Wi-Fi coverage in the Towns.	Explore where strategically placed, additional cell towers and Wi-Fi hot spots could enhance safety, security, and convenience provided by cellular coverage.
Better understanding of the natural disaster-related concerns surrounding the pipeline through Blenheim.	Identify locations where the pipeline was exposed, harden these, and make them a first priority for inspection following major flooding.
Increased communication among operators of the dams and related facilities, emergency responders, municipal officials, and residents.	Improve dialogue among all interested parties to address concerns related to dam facilities, downstream impacts, water releases, etc.
Correction of infrastructure deficiencies contributing to increased and repetitive flooding and damage.	Utilize reports and project documentation to identify infrastructure deficiencies. Undertake rock slide and slope stabilization to minimize the potential for infrastructure damage.
Improvement of evacuation routes to ensure continuous travel.	Repair some designated evacuation routes that are not continually repaired, or modify evacuation routes to ensure that residents can utilize them.





## Natural and Cultural Resources

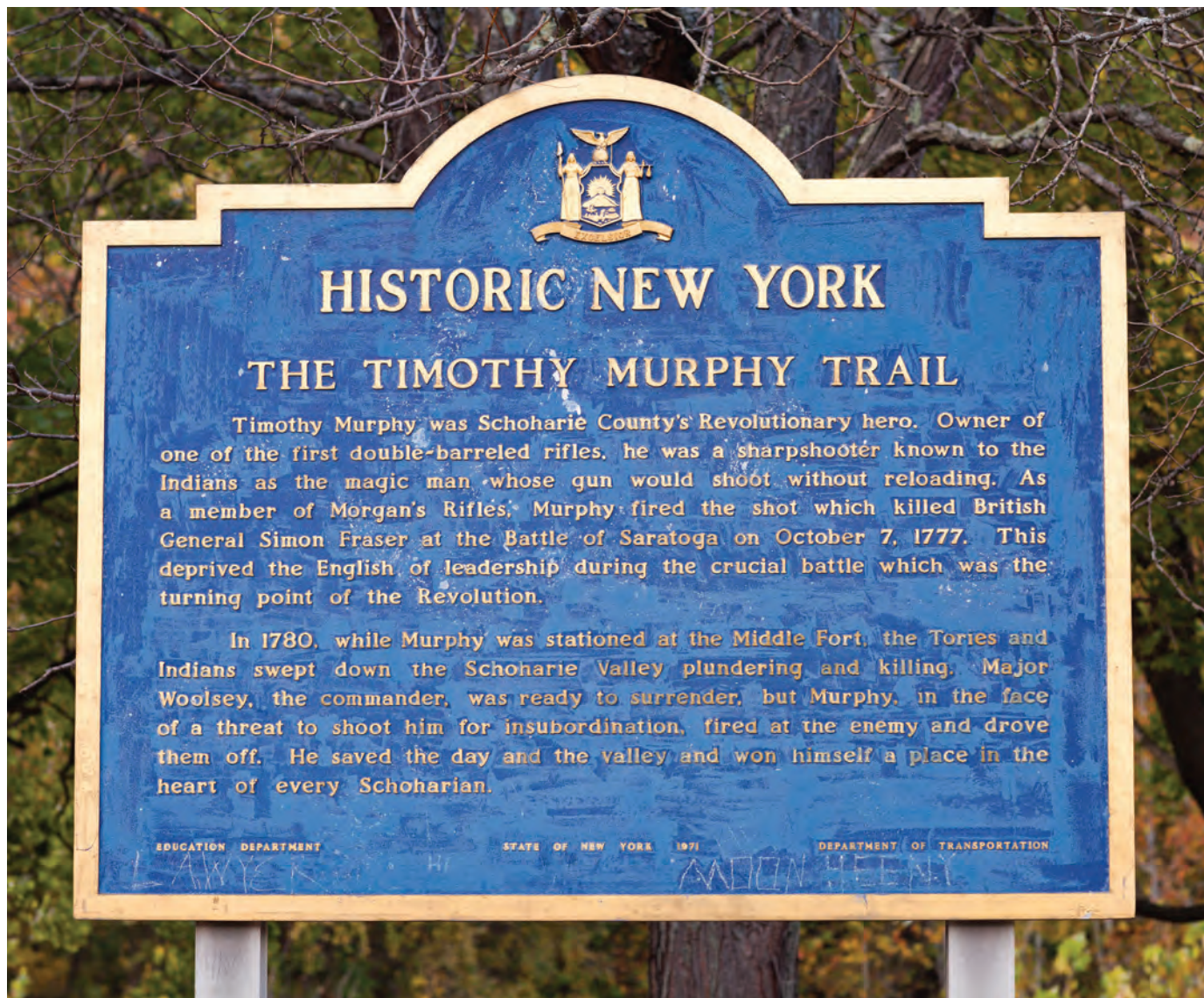
Natural and cultural resources assets in the Towns are present at every turn. The number of assets and total land area covered by these resources is substantial. Unfortunately, like many other assets in the Towns, many of these are located in the floodplain of Schoharie Creek or in areas impacted by runoff during large storms or snowmelts. The substantial flood risk in the Towns for these assets primarily relates to their proximity to the Schoharie Creek, although threats of flooding and damage associated with uphill water, and areas where sheetflow runoff is common, are also significant. Obstructions in the waterways, around bridges and culverts, and along common runoff areas reduce stream capacities and exacerbate flooding and impact these assets. Table 2.12 lists needs and opportunities associated with the Natural and Cultural Resources RSF.



Photo of Mine Kill State Park sign is courtesy of Tetra Tech, Inc.

**TABLE 2.12 – RECOVERY SUPPORT FUNCTION OF NATURAL AND CULTURAL RESOURCES**

Description	
Natural infrastructure has been increasingly recognized and promoted among hazard and climate planners and managers as a low-impact and sustainable means to mitigate losses from natural hazards. In the Towns, Schoharie Creek and its tributaries running down into Schoharie Valley are among the NYRCR Planning Area’s greatest assets, yet pose one of its most significant threats.	
Needs	Opportunities
Better utilize existing and potential new natural and recreational resources.	Link trail systems, parks, and recreation areas as a comprehensive system, and invest in aesthetic improvements and improved access. Utilize existing resources to increase potential draw to the area—a cost-effective way to enhance economic development within the Towns.
Capitalize on cultural resources in the Towns to market the area to tourists and to provide locations where community residents can gather.	Continue to support cultural resource enhancement projects underway.
Restore stream functionality and banks at many currently damaged creeks and streams.	Restore streams and stream banks to improve control of water, minimize erosion, and minimize degradation of water quality.
Restore and implement measures to increase resiliency of natural and cultural resources damaged or destroyed by Hurricane Irene.	As historic resources are rebuilt or restored, build in resiliency measures to protect these important assets from future storms. Utilize existing or new community centers for community gathering spaces and emergency shelter needs.
Consider other natural hazards related to flooding concerns.	Stabilize slopes to reduce instances of rock slides and mudslides during flooding events.



The Towns of Fulton and Blenheim are replete with numerous historic natural and cultural assets. Photo of sign for Historic New York Timothy Murphy Trail is courtesy of Tetra Tech, Inc.



# Section 3

## Reconstruction and Resiliency Strategies



*Photo is courtesy of Raymond Adams.*





## Section 3: Reconstruction and Resiliency Strategies

The NY Rising Community Reconstruction (NYRCR) Towns of Fulton and Blenheim Planning Committee (Committee) identified a series of strategies to address the most critical needs related to community health, safety, resiliency, and quality of life. These strategies were developed through existing plan reviews, public and stakeholder input, and quantitative analysis.

The strategies reflect community values, risk reduction, critical issues, needs, and opportunities, and are the foundation for identifying and prioritizing projects and implementation strategies detailed further in Section IV of this NYRCR Plan.

These strategies represent the Towns of Fulton and Blenheim NYRCR Plan's (NYRCR Plan) goals to build back better after the devastating impacts of Hurricane Irene and Tropical Storm Lee. Many of the needs identified by the Committee and presented in Section 2 of this NYRCR Plan are included in the following discussion to connect needs to related and relevant strategies.



*Pictured here is flooding covering State Route 30 in Blenheim during Hurricane Irene. Photo is courtesy of Earl Allen.*

These strategies were used to develop resiliency-focused projects. A detailed description of Proposed and Featured Projects can be found in Section 4: Implementation - Project Profiles. A list of all Proposed Projects, Featured Projects, and Additional Resiliency Recommendations is presented in Section 5: Additional Materials.

### Strategy 1: Emergency Preparedness and Response

**Improve emergency preparedness and response capabilities, and expand the capacity to mitigate potential storm impacts, especially with respect to socially vulnerable populations, by ensuring coordination before, during, and after storms.**

During Hurricane Irene and Tropical Storm Lee, flood-restricted roadways limited access to evacuation routes, and many residents were stranded or isolated. Sheltering capacity was significantly reduced, as most shelters were inaccessible during the flood. Immediately following the storms, emergency responders from all levels of government - local, County, State, and Federal - did what they could to check on residents, provide shelter, assess damage, and reopen areas that were hit the hardest.

However, efforts were hindered by inadequate communications, limited coordination between different layers of government, and difficulty with prioritization of response needs. Advanced disaster planning on a regional level could help to ensure that the regional response is more efficient, effective, and coordinated, so residents have access to important information and know what to do during times of crisis.

This strategy is focused on fostering greater community capacity and providing health and social services related to emergency response and recovery for all residents of the Towns of Fulton and Blenheim, including socially vulnerable populations.





Flood evacuation route signage. Photo is courtesy of Raymond Adams.



Protection of livestock was identified as an important goal of the Towns of Fulton and Blenheim NYRCR Planning Committee. Photo of horse is courtesy of Melissa Graham.

Strategy 1 suggests a need for specific actions that could better prepare citizens and emergency response agencies to “weather the storm.”

The Committee seeks to ensure that warnings are issued early, often, and through a variety of different means to ensure that all residents are aware of impending problems and are able to evacuate safely. Coordinated monitoring and alerting systems could increase the Community’s capacity to respond immediately to the threat of imminent flood dangers. Improving evacuation planning protocols is also an important goal of this strategy. This effort includes increased awareness of evacuation routes and evacuation procedures, so residents are aware of shelter locations and which evacuation routes lead to shelters.

Improving residents’ disaster preparedness and capabilities to shelter-in-place is an important goal of the Committee. The Towns of Fulton and Blenheim (Towns) will continue to “be good neighbors” and residents will keep safe tabs on their most vulnerable neighbors. These efforts could help to safeguard vulnerable populations and all other residents, by providing a quick response when it is needed.

Another important goal of emergency preparedness and response is to support agricultural resilience by making sure agricultural soils, farms, and livestock are protected from flooding and storm events. A robust emergency management plan will outline methodologies farmers and families can take to eliminate or minimize the impacts of future flooding disasters on livestock, crops, and farms. Table 3.1 lists projects defined by the Committee to accomplish Strategy 1.

**TABLE 3.1—STRATEGY 1: EMERGENCY PREPAREDNESS AND RESPONSE**

Improve emergency preparedness and response capabilities, and expand the capacity to mitigate potential storm impacts, especially with respect to socially vulnerable populations, by ensuring coordination before, during, and after storms.

Project Name	Opportunities	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Undertake Emergency Management Preparedness and Planning	<ul style="list-style-type: none"> <li>• Develop a regional, comprehensive, Emergency Management Plan that (1) updates the emergency management planning as new facilities are developed; (2) ties in with County and State efforts; (3) establishes a Pre-disaster Mitigation Program for community infrastructure, residences and residents, and businesses, and includes considerations to reduce flooding of important agricultural soils and encourage participation in the farm disaster preparation program with Cornell Cooperative Extension; (4) provides regional emergency response operations for all stakeholders, including fire, emergency medical services (EMS), law enforcement, elected officials, and public works departments, and ensures integration with State, Federal, faith-based, non-governmental organizations, not-for-profit and faith-based organizations; and (5) provides for a Regional Recovery Program, ensuring the current and future recovery programs are efficiently coordinated between stakeholders.</li> <li>• Conduct Evacuation Planning: Review existing evacuation plans (e.g., Dam Failure Evacuation Plans), and expand to include all hazards, ensuring the whole community is considered.</li> <li>• Identify alternative locations for staging emergency equipment in the event of flood.</li> <li>• Designate local shelter locations (including locations for animal evacuations on local farms) and evaluate shelter needs for redundant power generation and equipment stockpiles (e.g., cots, blankets, food supplies). Possible shelter locations include: Breakabeen Grange, Gilboa School, Schoharie County Garage (Route 30), Blenheim Hill Church, a new location in the north-end of Fulton, West Fulton Fire Department, and (New) Blenheim Town Hall.</li> <li>• Undertake educational outreach on family and business preparedness, home and business mitigation, programs to strengthen the community, and provide benefits of modifying wellheads at risk of being covered by floodwater. Work with property owners to raise wellheads, where necessary and feasible.</li> <li>• Identify evacuation signage needs and key locations for “You are Here” maps and “No Cell Phone Coverage” signage.</li> </ul>	\$750,000	Proposed	Y



**TABLE 3.1—STRATEGY 1: EMERGENCY PREPAREDNESS AND RESPONSE (CONT'D)**

Improve emergency preparedness and response capabilities, and expand the capacity to mitigate potential storm impacts, especially with respect to socially vulnerable populations, by ensuring coordination before, during, and after storms.

Project Name	Opportunities	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Provide Community Emergency Alert and Warning Systems and Support for Vulnerable Populations	<ul style="list-style-type: none"> <li>• Coordinated Monitoring and Alerting Systems (public and private sectors, families and individuals, and functional needs and vulnerable populations).</li> <li>• Identify and implement technological solutions for monitoring not just the Schoharie Creek but upland area creeks and streams to alert citizens, emergency responders, vulnerable populations and travelers of emerging flooding situations (e.g., roadway and mountainside monitoring systems) and rockslides, road closures, etc.</li> <li>• Consider utilization of NY ALERT system (including public education campaign and assisting with registration).</li> <li>• Investigate better coordination and tie-in between monitoring system(s) and alerts via sirens, phone calls, and other methods.</li> <li>• Coordinate a “Good Neighbor” check-in system, whereby neighbors volunteer to go door-to-door to check on each other and report to a central location (assuming communications work).</li> <li>• Undertake a Community Services Needs Assessment to assess the local demand for health care, emergency services, transportation assistance and senior needs; to fund a community services coordinator position or provide funds for an existing agency to provide these services.</li> <li>• Work with the Schoharie County Emergency Management Office to identify methods to encourage residents with special needs to complete the Special Care Needs Voluntary Registration form.</li> <li>• Create a Volunteer Corps to provide emergency first-aid and support to displaced persons and vulnerable populations during a disaster.</li> <li>• Develop a public education campaign outlining designated evacuation routes, shelter locations, home emergency preparedness kits (to support self-sustainment), dam flood potential and related emergency actions, and how and when to shelter-in-place. Educate residents who do not evacuate about the potential for delayed assistance.</li> </ul>	\$750,000	Proposed	Y



## Strategy 2: Critical Infrastructure Resiliency

**Protect critical infrastructure, improve communications, and explore additional energy resiliency measures.**

Strategy 2 directs efforts and investment toward fulfilling several needs identified by the Committee, including improved communication systems, protection for critical infrastructure, and ensuring redundant power generation and green energy options. Infrastructure and communication challenges in the Towns were identified repeatedly in NYRCR Planning Committee Meetings and Public Engagement Events as one of the greatest threats to public safety in the Towns. During Hurricane Irene, Committee Members with Internet-based cell phone extenders in their homes had emergency personnel lined up in front of their properties to make calls.

In many parts of Schoharie Valley and many uphill areas in the Towns, cell phone communication is not available, and when land lines go down, emergency communication is virtually impossible.

Improving cellular phone and wireless Internet coverage in the Towns to not only provide emergency communication capability, but also enhance the quality of life for residents, tourists, and current and future businesses is of particular importance to the Community.

One way to accomplish this strategy is to address infrastructure deficiencies that contribute to increased, repetitive flooding and damage, including upgrading existing culverts. Strengthening and assessing key infrastructure (including State Route 30 and the gas pipeline) could help to advance this strategy.

Relocating emergency and government facilities out of the floodplain and reducing their risk and vulnerability during future storms will also foster greater resiliency in the Community. Ensuring the emergency command centers in the Towns are upgraded for staging of emergency operations, including back-up power

generation and essential services during a disaster, will allow for greater regional coordination with adequate resources.

Table 3.2 lists projects developed by the Committee to accomplish Strategy 2.



*Adequate emergency alert systems and communications networks are critical in times of disaster. Photo of siren and communication pole is courtesy of Raymond Adams.*



**TABLE 3.2—STRATEGY 2: CRITICAL INFRASTRUCTURE RESILIENCY**

Protect critical infrastructure, improve communications, and explore additional energy resiliency measures.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Construct a Blenheim Municipal Complex	<p>Design the new building to include:</p> <ul style="list-style-type: none"> <li>• Multipurpose space designed as an Emergency Operations Center (EOC) that can host meetings and other vital Town functions;</li> <li>• Separate space for sheltering individuals and families to include a kitchen, full bathrooms, and storage areas for equipment;</li> <li>• New facilities to house Blenheim Fire Department equipment;</li> <li>• New facilities to house Blenheim Highway Department equipment;</li> <li>• Redundant communications (e.g., Amateur [HAM] radio and satellite communications);</li> <li>• Redundant power generation (permanent generator, solar);</li> <li>• Electrical connections to allow charging of devices;</li> <li>• Adequate parking area for individual vehicles and staging of equipment;</li> <li>• Area for distribution of supplies; and</li> <li>• Construction of a protected well and dedicated water supply spigot to provide drinking water to residents.</li> </ul>	\$2,999,417	Proposed	N
Rebuild Fulton Town Hall to more effectively operate as the Town Emergency Operations Center	<p>Complete necessary upgrades to allow the facility to properly operate as the Municipal Emergency Operations Command (EOC) Center. These include:</p> <ul style="list-style-type: none"> <li>• An enlarged EOC/Town Hall that incorporates all the elements needed to properly function as an EOC and Town Hall;</li> <li>• Redundant power generation (permanent generator, solar);</li> <li>• The upgrade of electrical connections to allow charging of devices; and</li> <li>• The construction of a dedicated water supply spigot to provide drinking water to residents.</li> </ul>	\$1,535,005	Proposed	N
Improve the West Fulton Fire Department	<p>Complete necessary upgrades to reduce conflicts between different emergency operations simultaneously underway at the facility:</p> <ul style="list-style-type: none"> <li>• Building addition to allow for additional shelter space;</li> <li>• Heating system and emergency lighting;</li> <li>• Septic and leech field to meet needs of expanded space;</li> <li>• Solar panels;</li> <li>• Expand parking to allow for better parking of vehicles, staging of equipment, and distribution of supplies;</li> <li>• Redundant Power (permanent generator, solar); and</li> <li>• Water storage unit (see above).</li> </ul>	\$1,095,908	Proposed	N
Replace Undersized Culverts	<p>Replace four existing culverts on Bear Ladder Road, Spur Road, Cole Hollow Road, and Dave Brown Mountain Road, sized to withstand a 1% annual occurrence flood/storm. Hydrologic analysis results show that the replaced culverts are undersized and are not anticipated to withstand a similar incident. Replace two culverts on Clauverwie Road and Blenheim Hill Road identified by Committee Members as undersized or improperly designed.</p>	\$1,200,189	Proposed	N



## Strategy 3: Economic Resiliency

**Promote economic and tourism growth by providing new and expanded opportunities and marketing resources for agri-business, and existing and emerging local businesses.**

Many businesses took a direct hit from Hurricane Irene and suffered both physical damage and structural damage. Down time caused by damage, power, and communications outages, or the inability to reopen due to accessibility issues adversely affected the Towns' economy.

While Strategy 3 focuses mainly on responding to the economic development and recovery challenges identified in the Towns, it addresses the need for both additional support services for local businesses and emerging entrepreneurs. This strategy focuses on guiding future growth and development, as well as investments in communications infrastructure and alternative energy sources, to provide sustainable, resilient, and reliable power generation for area businesses.

Strategy 3 addresses the greater goal of improving the local economic climate by promoting investment and attracting and retaining more businesses and residents, thereby adding to the tax base. Implementing this strategy could help to make the Towns of Fulton and Blenheim a better place to do business and call home.

**Efforts to promote business growth would have a discernible impact on the economic vitality of the Towns and the long-term viability of local businesses.**

This strategy envisions a larger goal of making the Towns an important destination along Route 30, between Margaretville and Middleburgh and beyond, connecting the Catskills to the Adirondacks. Significant economic assets are already positioned along State Route 30 and in the surrounding hills.

**Increasing year-round business and tourism opportunities would help to promote the health and vitality of area businesses, and bolsters the likelihood of attracting new ones.**

To encourage additional economic growth, the Committee feels that offering low-cost power options and alternative energy sources would incentivize new businesses to relocate to the area, and encourage existing businesses owners to stay.

Supporting the agricultural sector of the economy is also an important goal of this NYRCR Plan. Businesses that support agricultural assets (e.g., farms, farmer's markets, and agricultural suppliers) have been identified as a particular economic development niche opportunity. Supporting agricultural resilience could be further strengthened by mitigation efforts discussed in Strategy 1, through the development of an Emergency Management Plan (with a Hazard Mitigation Plan component).

Table 3.3 identifies those projects developed by the Committee to accomplish Strategy 3. Additional projects that support this strategy are found in the Additional Resiliency Recommendations in Section 5 of this NYRCR Plan.



*While seasonal farm stands, such as this one that offers farm-fresh goods to residents and visitors to the Towns of Fulton and Blenheim, are available, the local economy needs more year-round businesses. Photo is courtesy of Raymond Adams.*



**TABLE 3.3 – STRATEGY 3: ECONOMIC RESILIENCY**

Promote economic and tourism growth by providing new and expanded opportunities and marketing resources for agri-business, and existing and emerging local businesses.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Become a Destination Corridor Between the Catskills and Adirondacks	<p>Work to increase the visibility of the Route 30 corridor as a primary north-south route with significant tourism and recreation opportunities. This project will focus on needs in the Towns of Fulton and Blenheim, including:</p> <ul style="list-style-type: none"> <li>• Development of a marketing and tourism strategy for the NYRCR Planning Area and Route 30 area.</li> <li>• Work closely with regional anchor communities, and County and State agencies to become a destination corridor along Route 30 by undertaking infrastructure improvements and enhancements.</li> </ul> <p>Options to explore include:</p> <ol style="list-style-type: none"> <li>(1) targeted streetscaping improvements to enhance walkability in the historic and recreational locations;</li> <li>(2) improved off-site signage and sign standardization;</li> <li>(3) installed signage for specific locations, including Vromans' Nose, Looking Glass Pond, the Blenheim Bridge, and trailheads;</li> <li>(4) seek scenic byway designation; and</li> <li>(5) create more exercise trails and on-road facilities for biking, walking, and hiking.</li> </ol>	\$1,125,000	Featured	Y

## Strategy 4: Regional Development

### Protect, preserve, and enhance important cultural, historic, and natural resource assets.

The Town of Fulton and Blenheim have a common sense of place and identity that is largely defined by natural, cultural, and historic resources. Along with the critical infrastructure and transportation assets that are often the focus of disaster mitigation or preparedness efforts, natural, cultural, and historic resources bind together all elements of truly resilient communities. They often represent the very reasons residents choose to call the Towns of Fulton and Blenheim their home.

The Towns' natural, cultural, and historic assets are critical components of the recovery and future economic development goals, so their protection and enhancement are central to this NYRCR Plan.

Strategy 4 addresses a range of needs and opportunities, from restoring stream conditions and the functionality of streams, to protecting important historic and cultural resources. Addressing stream conditions that cause repeat floods, including silt deposits, stream bank erosion, and remaining debris, is one aspect of this strategy.

The Committee seeks to capitalize on the wealth of natural, recreational, and cultural resources to bring additional tourists to the area. It is very important, therefore, to protect important natural and cultural resources from flood damage. Accordingly, investments should be made in projects that build on current efforts to promote the cultural and natural resources of the Towns, while ensuring that improvements include floodproofing and other resiliency measures.



*Debris of broken trees from the Old Bridge, shown above, clogged waterways. Photo is courtesy of Melissa Graham.*

Opportunities that arise from this strategy include restoring and maintaining stream banks; stabilizing slopes; and better understanding the potentially destructive power of the Schoharie Creek and its tributaries.

Increasing resiliency for the Town's cultural, historic, and natural resources, while creating a comprehensive recreation system, are other important goals.

Table 3.4 identifies those projects developed by the Committee to accomplish Strategy 4.



**TABLE 3.4 – STRATEGY 4: REGIONAL DEVELOPMENT**

Protect, preserve, and enhance important cultural, historic, and natural resource assets.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
<b>Undertake a Hydrology and Engineering Study of the Schoharie Creek and its Tributaries</b>	<p>Undertake a detailed hydrology and engineering study of the Schoharie Creek and tributaries, a minimum of 5,000 feet upstream from where they empty into the Schoharie Creek or the upstream limit of human impacts (agriculture, logging, roads, and home sites).</p> <p>Investigate the potential to add additional communities if funding and scope are feasible, and consider the following:</p> <ul style="list-style-type: none"> <li>• This study should identify specific opportunities for stream restoration, floodplain reconnection, protection of agricultural soils, and other targeted efforts to improve stream function and reduce flooding.</li> <li>• Specific projects to be implemented for streambank restoration include behind Blenheim Town Hall and other projects identified during the study.</li> </ul>	\$1,150,000	Proposed	N
<b>Incorporate Resiliency Measures into the New Community Center</b>	Incorporate resiliency measures into the new Community Center in the Old Presbyterian Church (engineering study and structural and hardening measures already studied).	\$253,253	Proposed	N
<b>Incorporate Resiliency Measures into the Bridge Schoolhouse Museum</b>	Incorporate resiliency measures into the Bridge Schoolhouse Museum restoration project (flood-proofing and hardening).	\$132,374	Proposed	N
<b>Undertake Slope Stabilization and Rock Slide Stabilization Efforts</b>	Undertake stabilization efforts at two identified locations along Route 30 and along Bear Ladder Road. Identify other potential slope stabilization locations for further consideration and assessment.	\$400,000	Featured	N
<b>Develop a Local Stream Management and Maintenance Plan</b>	Develop a local Stream Management and Maintenance Plan to complement on-going, County-wide stream maintenance efforts. The plan will provide (1) a local focus as a complementary activity to the ongoing County stream maintenance efforts; (2) a mechanism for ongoing identification and prioritization of stream issues; (3) an outline of local strategies to address access, easement, permitting, and funding issues; and (4) educational information on available programs regarding stream management and maintenance.	\$250,000	Featured	N



## Strategy 5: Residential and Business Flood Mitigation Support

**Reduce the impact of flooding on housing and create initiatives to assist with implementation of additional resiliency measures.**

Strategy 5 addresses the need to reduce the impacts on the Town's existing housing stock from repetitive flooding, and to institute comprehensive floodplain management.

In recent years, FEMA buy-outs have reduced the number of homes in Blenheim and Fulton that are prone to severe repetitive flooding, but there are still properties at risk throughout the Towns. To assist the residents and businesses remaining in high risk areas, the Committee suggests these property owners be provided with information about ways to implement flood protection measures, and to explore the development of a flood protection assistance program. Home and business mitigation improvements should reduce the risk of future property damage. Implementing a comprehensive approach to floodplain management could also help to ensure public safety during storm events, avoid temporary or permanent closures of businesses, and the relocation of residents. A comprehensive approach would include a holistic, integrated, and adaptive flood management program that could consider implementation actions to minimize and mitigate flood-related issues in the floodplain. These could be based on balancing social, economic, natural resource protection needs and priorities in the Towns, as well as any existing local, State, and Federal regulations or requirements.

A balance should be struck between social, economic, and natural resource protection needs, as well as support services for vulnerable populations and the business community. Please refer to the Additional Resiliency Recommendations in Section 5: Additional Materials, for a project related to this strategy.



*Home in Blenheim with washed-out foundation, missing siding and window. Photo is courtesy of Keith Graham.*



*Feet of flood waters surround this home and farm in Blenheim. Photo is courtesy of Melissa Graham.*



# Section 4

## Proposed and Featured Project Profiles



*Photo is courtesy of Eric Thayer*





## Section 4: Proposed and Featured Project Profiles

### The Path Forward

Following months of information gathering, planning and data analysis, the Towns of Fulton and Blenheim NY Rising Community Reconstruction (NYRCR) Planning Committee (Committee) identified projects for prospective advancement under the NYRCR Program.

### Initial Project Identification

The project development process was initiated through a combination of reviews of existing plans, public outreach, and Committee discussions. The result was a collection of approximately 30 possible projects and initiatives that spanned a breadth of needs and opportunities for the Towns of Fulton and Blenheim (Towns).

### Preliminary Project Analysis

The full list of identified projects was initially evaluated and refined, based on three primary criteria to create a manageable universe of projects for further assessment. Project evaluation criteria included categorization, feasibility, funding availability, and alignment with Towns of Fulton and Blenheim NYRCR Plan goals.

### Detailed Analysis and Final Project Selection

Getting to final project selection involved several months of discussions among the Committee, soliciting input from the public and stakeholders regarding project specifics, and comprehensive project analyses. These analyses included a detailed cost-benefit analysis, a risk reduction analysis, and either hydraulic modeling (HEC-RES) or a qualitative risk-reduction analysis.

These efforts resulted in the Committee assigning projects into three categories: Proposed Projects, Featured Projects, and Additional Resiliency Recommendations.



*The beautiful scenery that makes the Towns of Fulton and Blenheim so appealing can also make it treacherous during major storms that result in flooding. Photo of river in early fall with house at its shore is courtesy of Raymond Adams.*





## Undertake Emergency Management Preparedness and Planning (Proposed)

This project will provide the Towns of Fulton and Blenheim with a comprehensive Emergency Management Preparedness Plan to enhance disaster response, coordination, and efficiency for residents, vulnerable populations, and businesses.

### Connection to the Disaster

Flooding is a common occurrence in the Schoharie Valley, but flooding on the scale of Hurricane Irene and Tropical Storm Lee was incomprehensible. The two major events, separated by only a week, tested the absolute limits of the capabilities of emergency and disaster relief response in the Towns of Fulton and Blenheim. The damage was extensive. Data, mapping and stories from residents indicate that closed or impassable roads during the first 48 hours after the height of the storm effectively trapped many residents until the roads could be reopened or made passable.

### Project Description

This proposed project would create a comprehensive, Multi-Municipal Emergency Preparedness and Response Plan created with input from emergency services providers, the Towns of Fulton and Blenheim, Schoharie County Emergency Management Office (EMO), relevant New York State agencies, and possibly relevant Federal Government agencies to improve the overall preparedness and future response to flood-related disasters.

This is a large-scale, multi-faceted emergency response and public outreach planning project that will undertake the following activities:

- Update emergency management planning as new facilities are developed;



- Tie-in with County and State efforts; and
- Establish a pre-disaster mitigation program for community infrastructure, homes and residents, and businesses. Include considerations to reduce flooding of important agricultural soils, and encourage participation in the farm disaster preparation program with Cornell Cooperative Extension.
- Provide details on regional emergency response operations for all stakeholders. This should include emergency medical services (EMS), law enforcement, elected officials, and public works departments. These efforts should also ensure integration with State, Federal, non-governmental agencies (NGO), and not-for profit (NFP) and faith-based organizations that respond and participate in local disaster relief.
- Develop a Regional Recovery Program to help ensure that current and future recovery programs are efficiently coordinated between stakeholders.



*Pictured here is a possible shelter location at the Breakabeen Grange building. Photo is courtesy of Raymond Adams.*



- Undertake an evacuation planning effort by reviewing current local evacuation plans, such as those already developed for the local fire departments, dam failure evacuation plans, and all other hazards (fire, ice and snow storm, earthquake) to ensure inclusion of the entire community.
- Designate local shelter locations for people and livestock. Evaluate individual shelter needs, such as the need for redundant power generation (e.g., permanent generators, solar power) and equipment stockpiles (e.g., cots, blankets, food supplies). Possible shelter locations include the Breakabeen Grange, Gilboa-Conesville School, and Schoharie County Garage on Route 30, Blenheim Hill Church, and a new location to be determined in the north end of the Town of Fulton, the West Fulton Fire Department, and the proposed new Blenheim Town Hall.
- Initiate an educational outreach effort to include education on family and business preparedness, home and business mitigation, and programs to strengthen the Towns. In addition, this effort should discuss the need for residents and business owners to consider raising wellheads, where necessary and feasible, to help ensure that drinking water sources do not become contaminated following a natural disaster.
- Identify evacuation signage needs and key locations for “You are Here” maps and “No Cell Phone Coverage” signage.
- The efforts of this project could help to guide emergency response in as much of a defined process as can reasonably be undertaken in a natural disaster. Efforts could also help to provide a sense of clarity on the roles and responsibilities of those responding, provide the public with a better sense of how disaster relief is programmed and carried-out in the community, and protect the citizens and businesses of these two tightly knit Towns of Fulton and Blenheim.

## Regional Coordination

While this planning effort was undertaken by the joint Towns of Fulton and Blenheim NYRCR Planning Committee, it covers two distinct and separate municipalities: the Town of Fulton and Town of Blenheim. These Towns have a long history of coordinating and working together on a variety of issues and problems, especially in the wake of Hurricane Irene and Tropical Storm Lee.

This project will likely require the input and participation of Schoharie County’s Emergency Management Office (EMO), Soil and Water Conservation District, and Planning and Development Department. It should also include input from the adjacent Town of Gilboa and the Town and Village of Middleburgh, which share many of the same flooding issues as Fulton and Blenheim. This effort will also include public engagement and education as well as coordination with appropriate State and Federal agencies.

## Cost Estimate

The estimated total project cost is **\$550,000**.

## Project Benefits

Hurricane Irene tested the limits of resiliency and capabilities of emergency response and disaster response. Damage was extensive, and most roads were closed, residents were trapped until roads could be reopened, and lessons were learned that can be used to help guide emergency response to future storms.

This project provides multiple benefits to the Towns, including risk and damage reduction that is essential, based on the impacts from Hurricane Irene. It also provides economic and social benefits that are consistent with the intent of the NYRCR Program and benefit residents and business owners in the Towns. Additional assessment of existing conditions could better prepare the Towns for future storms, and to be more resilient.





## FLOOD PROTECTION AND EMERGENCY RESPONSE

This project has the potential to reduce the amount of damage caused by a flooding event, by allowing emergency responders, residents, and businesses to better understand the priorities and methods for handling a flooding event. But more importantly, this project is the primary planning process through which emergency response can be undertaken in a more defined and comprehensive manner. It can provide clear direction on how to proceed in the event of a flooding disaster, and define the roles and responsibilities of those charged with emergency response.

### ANTICIPATED REDUCTION OF RISK

This project should help to reduce risk by:

- Providing a framework for efficient, effective, coordinated, and comprehensive emergency response to flooding disasters;
- Improving emergency responders' abilities to respond by helping them understand how and when to respond, and by protecting residents, businesses, and property in the two Towns by having a well-defined and consistent response program.
- Increasing the public's confidence about shelter accessibility and preparedness.

### ECONOMIC BENEFITS

A coordinated emergency management program should help to expedite emergency operations and recovery efforts, and would likely save lives and property. Efficient and effective response and recovery efforts reduce the immediate impacts of a disaster, and can minimize severity in the community. Businesses should be able to open more quickly and commerce should resume more quickly with the improvements suggested under this project.

A comprehensive emergency management program could help to build confidence in both residents and existing local businesses, and to attract tourists and new businesses. These improvements, aimed at building a more resilient Fulton and Blenheim, also could potentially reduce property insurance rates, as response times could be shortened.

### ENVIRONMENTAL BENEFITS

This project could help to ensure that a more comprehensive and efficient assessment of conditions related to flooding are undertaken, as soon as the immediate threats to life and vital infrastructure and property are assessed. The assessment can allow property owners and emergency responders to act more quickly and comprehensively to identify, secure, or remove potential environmental hazards, and stabilize property at risk from floodwaters.

### SOCIAL BENEFITS

The safety and welfare of people and property in the Towns is the top priority. This project could improve the well-being of residents and businesses by helping the Towns be more prepared for future storms; educating residents on how and where to act/react; ensure that residents have access to shelters; and doing so in a coordinated manner that protects the health, safety, and welfare of anyone in the Towns during a flooding disaster.

**This project aligns with several initiatives currently undertaken by the Schoharie County Emergency Management Office in the wake of the storms, and can greatly augment those efforts. It should enable emergency management planning on both local and regional levels.**



Shown here West Fulton Fire Department. Photo is courtesy of Raymond Adams.

## ADDITIONAL BENEFITS

Overall, additional benefits could be realized through the increased outreach and knowledge that both emergency responders and the public would have through the development of this project. Whether or not each household in the Towns is fully engaged and aware of the details of this project, they can be more educated and thus, more aware of the fact that their community has planned for disasters.

## PUBLIC SUPPORT

This project is all about supporting and protecting public safety. Public input gathered throughout the NYRCR planning process indicated a need to better plan for and manage disasters. This includes educating the public on the potential risks and dangers of flooding disasters. The public was clear that there are lessons to be learned from Hurricane Irene; many of those lessons can be identified and planned for as part of this project.

## Project Cost-Benefit Analysis

Undertaking formal emergency preparedness and planning could benefit the Towns' resilience against future storms. It could improve the ability of emergency responders to act in a more comprehensive and coordinated manner, and protect lives and property. These measures are essential to making the Towns more secure in their ability to respond to a disaster.

This proposed project would greatly benefit the Towns' safety and health, mobility, accessibility, and environmental and economic needs. Improvements in preparedness and disaster response collectively position the Towns, County, and other emergency responders from the State and other agencies to benefit from this project.

There are externalities from this project that need to be considered. There is some degree of uncertainty in the level of detail needed in any planning effort; however, basic project needs should be fully defined through a detailed project scoping process.





## Implementation Time Frame

General project implementation—including hiring a consultant, undertaking plan development, and submitting a final document for use by the Towns—is expected to be accomplished within a 12 to 18-month period. The length of the effort is primarily due to the amount of outreach and public input sessions that are anticipated. Implementation of the plan, once complete, would be ongoing.

## Jurisdiction

Jurisdiction for this proposed project rests with the Town of Fulton and the Town of Blenheim. Coordination with the Schoharie County Emergency Management Office would be necessary, as this project would augment efforts already underway.

## Regulatory Requirements

It is anticipated that the completion of this project will not require any regulatory or permitting approvals.

## SUMMARY

### Undertake Emergency Management and Preparedness Planning

- Investment: \$550,000
- Assets protected: All assets in the Towns of Fulton and Blenheim
- Jobs created: 4.62 Full-Time Equivalent (FTE)\*
- Strategies supported: 1, 2, 4, 5

\* The FTE construction jobs were estimated based on a methodology developed by the United States Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.



## Provide Community Emergency Alert and Warning Systems and Support for Vulnerable Populations (Proposed)

On August 27, 2011, the National Weather Service issued flood warnings for Schoharie County. The Schoharie Creek swelled over its banks and wreaked havoc on the Towns. Homes, streets, government buildings, electrical and communications infrastructure, businesses, parks, bridges, and culverts were damaged or destroyed. Residents were completely cut off from means of communication, food sources, clean water, and medical services. State Route 30 was inaccessible, and the Hamlets were completely isolated.

### Connection to the Disaster

A coordinated and comprehensive monitoring and alert system for the Towns is essential to protecting lives and property. While a verbal warning system was in place in parts of Fulton and Blenheim during Hurricane Irene, it did not cover the entire Town of Fulton and Blenheim NYRCR Planning Area. Gauges and monitoring equipment are limited to areas along the Schoharie Creek where the flooding takes place. However, much of the water that caused the problem came from the hillsides, through creeks and streams that are unmonitored. These became raging flows of water, mud, and debris from hillsides that significantly compounded flooding along the low-lying Schoharie Valley floor.

### Project Description

The proposed project would coordinate existing emergency monitoring, communications, and alerting systems with each other and with new/expanded technologies and systems.



*Photo of elderly woman shaking hands with younger woman at front door is courtesy of Tetra Tech, Inc.*

### Components

- Implement technological solutions such as water level gauges and monitoring equipment for assessing conditions of the Schoharie Creek, and upland area creeks and streams. Alert citizens, emergency responders, vulnerable populations, and travelers of emerging flooding situations, rockslides, and road closures.
- Better utilize the NY-Alert system by conducting a public education and registration campaign, and customizing its use to these Towns.
- Implement better coordination and tie-in between existing and proposed monitoring systems, alert sirens, phone calls, texts, and other widely available methods.
- Consider the placement of drop-down gates to block the road in advance of a flooded section.
- Coordinate a “Good Neighbor” check-in system, whereby neighbors volunteer to go door-to-door to check on each other and to report to a central location (assuming communications are working).
- Undertake a Community Services Needs Assessment to determine local demand for health care, emergency services, transportation assistance, and senior needs. This project could also fund a community services coordinator position or provide funds for an existing agency to provide these services.
- Work with the Schoharie Emergency Management Office (EMO) to identify methods to encourage residents with special needs to complete the





Special Care Needs Voluntary Registration form.

- Create a volunteer corps to provide emergency first aid and support to displaced persons and vulnerable populations during disasters.
- Develop a public education campaign that outlines designated evacuation routes, shelter locations, home emergency preparedness kit essentials (to support self-sustainment), dam flood potential and related emergency actions, and how and when to shelter-in-place. Educate residents who do not evacuate about the potential for delayed assistance until it is safe for emergency personnel to reach them.

Collectively, these measures can improve monitoring and alert functionality, and raise awareness about emergency preparations for vulnerable populations, all other residents, and businesses in the Towns.

## Regional Coordination

This planning effort covers two distinct and separate municipalities—the Town of Fulton and Town of Blenheim. These Towns have a long history of coordinating and working together on a variety of issues and problems, especially in the wake of Hurricane Irene and Tropical Storm Lee. This project will require the input and participation of the Schoharie County EMO, Schoharie County Soil and Water Conservation District, and the Schoharie County Planning and Development Department. It should also involve the adjacent communities of Gilboa and the Town and Village of Middleburgh in terms of mutual flood issues. This project will also coordinate and where possible, integrate with NYS efforts to build an enhanced system of weather monitoring and warning technologies. This project seeks to be complementary to existing and proposed systems and will provide much needed localized focus.

## Cost Estimate

The estimated total project cost is **\$750,000**.



*Sirens on Blenheim Town Hall. Photo is courtesy of Raymond Adams.*

## Project Benefits

A monitoring and alert system that benefits the Towns and focuses on ensuring vulnerable populations are alerted is essential to protecting lives and property. Though an existing verbal warning system is in place, as are phone and text alerts from NYS and the National Weather Service, early warnings were not adequate during Hurricane Irene and Tropical Storm Lee.

The verbal warning system did not cover the entire NYRCR Planning Area, gauges and monitoring equipment are limited to areas along the Schoharie Creek, and much of the water came from unmonitored hillside creeks and streams.

This project can improve and increase early warning system elements necessary for better future emergency hazard notification and communication throughout the Towns. The project will allow for Town-specific planning, but will be coordinated with efforts underway throughout Schoharie County, thus addressing emergency management, both locally and regionally. This project would tie into the emergency preparedness and planning project, as it would address communications infrastructure needs.



## FLOOD PROTECTION AND EMERGENCY RESPONSE

This project will provide more complete, accurate, comprehensive, and real-time data on the water levels in the Schoharie Creek and tributaries, thereby providing a more accurate picture of the potential for flooding. This can potentially reduce the amount of damage caused by a flooding event by allowing emergency responders, residents, and businesses to have greater warning and situational awareness. In addition, this project can improve and increase early warning available to residents throughout the Towns, who can then decide how and when to act.

## ANTICIPATED REDUCTION OF RISK

This project is designed to reduce risk by advancing implementation of a robust early warning system that includes:

- Deploying more stream gauges for locations that are known to exacerbate the flooding problem in the Schoharie Creek can provide more realistic and real-time data;
- Increasing the coverage of the warning system and tying it into other warning system(s) can provide for a more comprehensive approach to warning residents in the Towns; and
- A well-deployed, comprehensive warning system has the potential to improve emergency responders' abilities to respond efficiently and effectively across the Towns.

## ECONOMIC BENEFITS

In addition to economic growth spurred by construction, improvements aimed at building a more resilient community could provide greater confidence for private investors to locate in the Towns. These investments illustrate a commitment to future resiliency and can go far to encourage individuals and private businesses to locate in the Towns. Finally, by providing safer transportation and accessibility, individual property values are likely to grow over the long term.

## ENVIRONMENTAL BENEFITS

Specific environmental benefits associated with this project include improving the quality of flood-related data; the ability to better plan for the various flood stages of the Schoharie Creek and its tributaries; and improving response to emergencies, as well as infrastructure in environmentally sensitive areas.

## SOCIAL BENEFITS

This project can improve the well-being of residents and businesses by making the Towns more prepared for future storms. It should provide real-time data through a more comprehensive data gathering system, and a more complete, multi-media system for early warning notifications.

The enhancement of the flood emergency information system and data should increase the likelihood of evacuations before conditions require sheltering-in-place. It should also enhance the ability of existing notification systems to provide more advanced warning and detailed information.

## PUBLIC SUPPORT

The public has been clear that early warnings were not adequate during Hurricane Irene and that significant improvements are needed.

## Project Cost-Benefit Analysis

Based on available information and project details, this proposed project would benefit Community safety and health, environmental, and accessibility concerns. Improvements in flow monitoring and early warning collectively position the Towns, the County, and other emergency responders to benefit from this project. There appear to be no foreseen significant externalities, as this project would effectively add capacity to an existing system and is not anticipated to result in any down-time or significant effects.





## Implementation Time Frame

General project implementation, including hiring a consultant for planning and public engagement, and an engineering firm to design, install, and activate an expanded monitoring and alert system, could be accomplished within 18 to 24 months.

## Jurisdiction

Jurisdiction for this proposed project is with the Town of Fulton and Town of Blenheim.

## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals from appropriate agencies, including a New York State Department of Transportation (NYS DOT) Highway Work Permit to provide driveway access to any new infrastructure sites, and local construction and building permits.

## SUMMARY

### Provide Community Emergency Alert and Warning Systems and Support for Vulnerable Populations

- Investment: \$750,000
- Assets protected: All
- Jobs created: 6.3 FTE\*
- Strategies supported: 1, 2, 4, 5

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending



## Construct a Blenheim Municipal Complex (Proposed)

Currently, the Blenheim Fire Department, Town Hall, Emergency Operation Center (EOC), and Post Office are co-located in the floodplain.

### Connection to the Disaster

As a result of Hurricane Irene, nearly four feet of water from the flooding of the Schoharie Creek inundated the building that houses the Blenheim Fire Department, Town Hall/EOC, and Post Office. The facility was inaccessible during the height of the flooding, as a large section of Route 30 in this area, the only road to the facility, was also flooded with several feet of water. After Hurricane Irene, it became clear that the current location is not adequate or safe in the face of a major flooding event. It also demonstrated that the building cannot be used as an EOC or base of operations during a disaster, and that there is a lack of shelter space in the area.

### Project Description

This project would involve a relocation of the Blenheim Town Hall out of the floodplain to a more secure location with adequate road access, to allow responders to reach all parts of the Town. Specifically, this project proposes to move all Town functions from the current location at 1748 State Route 30 to a new site outside the floodplain. This new location should allow emergency responders to reach the far ends of the Town without having to travel over roads at risk of being compromised during major storm events.

This project is a multi-faceted, complete relocation and design project to construct a new Blenheim Municipal Complex to house the EOC, Fire Department, Town Hall, and emergency shelter.



*Pictured here is Blenheim Town Hall. Photo is courtesy of Raymond Adams.*

### Components

- Multipurpose space designed to function as an EOC that can host meetings and other vital Town functions.
- Separate space for sheltering individuals and families. This space could include access to a kitchen, separate full bathrooms, and storage areas for shelter equipment, such as chairs, cots, blankets, tables, etc.
- New facilities to house the Blenheim Fire Department equipment.
- New facilities to house the Blenheim Highway Department equipment, including truck bays and administrative space used in an emergency to help dispatch equipment.
- Redundant communications (Amateur [HAM] radio, and satellite communications).
- Redundant power generation (permanent generator and/or solar).
- Electrical connections to allow charging of devices.
- Adequate parking area for individual vehicles and staging of equipment.
- An area indoors and outdoors to allow for the stockpiling and distribution of supplies.
- Construction of a protected well and dedicated water spigot to provide drinking water to residents.





## Regional Coordination

This is a local project that does not require regional coordination.

## Cost Estimate

The estimated total project cost is **\$2,999,417**.

## Project Benefits

This project would remove a critical municipal facility from the existing floodplain, and relocate the functions of the Town to a safe location for emergency response purposes. The existing facility was flooded and inoperable during Hurricane Irene. The current building does not have sheltering space.

### FLOOD PROTECTION AND EMERGENCY RESPONSE

This project should eliminate the potential for damage caused by a flooding event by relocating Town and Fire Department functions to a new location outside the floodplain.

### ANTICIPATED REDUCTION OF RISK

Undertaking this project should result in significant risk reductions from flooding, as a new facility would be constructed outside the floodplain.

### ENVIRONMENTAL BENEFITS

Though not a direct environmental benefit, this project will result in increased emergency response and operations capacity, which could lead to better response time to emergencies that affect environmentally sensitive areas. If solar backup power is added, this will help work toward a reduction of carbon emissions by eliminating the reliance on carbon-emitting power and back-up-power sources.

## ECONOMIC BENEFITS

This project is focused on strengthening and prioritizing local emergency response and recovery capabilities. This type of investment increases confidence in the private sector, and shows a commitment to improving the future of residents in the Community.

## SOCIAL BENEFITS

This new facility will create new capacity for care for citizens, vulnerable and high-risk populations by providing safe and accessible shelter during a disaster. It will also allow the Town and Fire Department to be able to carry out their duties during a flood event and provide enhanced capabilities to undertake EOC operations through the development of a space that is designed for EOC activities.

## PUBLIC SUPPORT

The public acknowledged throughout the planning process that the existing facility was inadequate to support EOC-type operations that were undertaken during Hurricane Irene. Not only is the EOC in the floodplain, rendering it potentially useless in a major flood, but the space is inadequately sized to meet response and sheltering needs.

## ADDITIONAL BENEFITS

The new facility could provide better response continuity during an emergency. By addressing and augmenting the Towns' abilities to address their own needs during a disaster response, it should reduce the burden placed on County, State, and Federal response organizations.

## Project Cost-Benefit Analysis

This project would benefit the entire Community by improving the functionality and resiliency of government and emergency response activities, and increase available shelter space. This project should improve the ability of emergency responders to protect life and property.



Based on available information and project details, this proposed project would benefit the Towns' safety, health, and welfare. Improvements in preparedness and disaster response position the Towns, County, and other agencies to benefit from the project, as well.

## Implementation Time Frame

General project implementation, including hiring an architectural firm to design the building and securing a site for the facility, could take place within 6 to 9 months. Construction of the new facility would take an additional 6 to 9 months for a total project timeline of 12 to 18 months.

## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals from appropriate agencies, including a NYS DOT Highway Work Permit and local construction and building permits.

## Jurisdiction

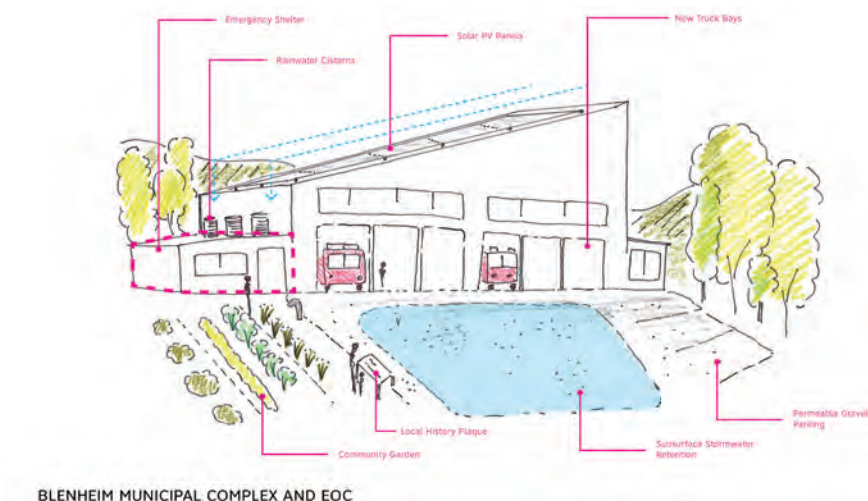
Jurisdiction for this proposed project is with the Town of Blenheim.

## SUMMARY

### Construct a Blenheim Municipal Complex

- Investment: \$2,999,417
- Assets protected: 1 multi-use structure
- Potential future loss prevented: Yes
- Jobs created: 25.1 FTE \*
- Strategies supported: 1, 2

\* The FTE construction jobs were estimated based on a methodology developed by the United States Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.



Artistic rendering of the proposed Blenheim Municipal Complex. Rendering is courtesy of SCAPE.





## Rebuild Fulton Town Hall to More Effectively Operate as the Town Emergency Operations Center (Proposed)

The existing Fulton Town Hall/Highway Department serves many functions, and was utilized as the Emergency Operations Center (EOC) during Hurricane Irene. It has a single bathroom with one toilet and one sink, no shower and little privacy from the single-room office space on the other side of the door. During the storm, dozens of Town staff, emergency responders, and disaster relief workers crammed into the approximately 1,000-square foot space to coordinate a massive response to the disaster that unfolded.

### Connection to the Disaster

The current Fulton Town Hall is not designed to accommodate an EOC and emergency response functions. During Hurricane Irene, an estimated 100 people crammed into the insufficiently sized administrative office. Town Hall has a single bathroom, no shower, and few work spaces. Arguably, the building is beyond its useful life.

### Project Description

The proposed project would update the existing, outdated, and inadequate Town of Fulton municipal building, located at 1168 Bear Ladder Road, West Fulton, and enhance its ability to properly serve as an EOC. Specific project work would include rebuilding (or expanding) the existing building and one open-air equipment storage shelter.

### Components

- An enlarged EOC/Town Hall that incorporates all the elements needed to properly function as an EOC and Town Hall;



*Pictured here is the Fulton Town Hall. Photo is courtesy of Raymond Adams.*

- Vehicle bay space and EOC/administrative space designed to be at least twice the current size;
- Redundant power generation (permanent generator/solar);
- Electrical connections to enable device charging; and
- A dedicated water supply spigot to provide drinking water to residents.

An expanded and updated Fulton Town Hall would provide the necessary features to allow the facility to properly and adequately function as an EOC.

### Regional Coordination

This is a local project that does not require regional coordination.

### Cost Estimate

The estimated total project cost is **\$1,535,005**.

### Project Benefits

This project would improve Command Center operations and efficiencies. The existing Fulton Town Hall is not designed to accommodate an EOC and emergency response functions. During Hurricane Irene, scores of Town staff, emergency responders, and disaster relief workers crammed into the administrative space. The structure has a single bathroom, no shower, and little privacy. This project could reduce risk and provide environmental and social benefits.



## EMERGENCY RESPONSE

This project could improve municipal emergency response capabilities. The facility could be designed to accommodate dozens of emergency responders and dispatch equipment and resources.

## ANTICIPATED REDUCTION OF RISK ASSOCIATED WITH THE PROJECT

Undertaking this project should result in a reduction to risk for the entire Town.

## ENVIRONMENTAL BENEFITS

Though not a direct environmental benefit, this project should result in increased emergency response and operations capacity that could lead to better response time to emergencies that affect environmentally sensitive areas.

## ECONOMIC BENEFITS

This project is focused on strengthening and prioritizing local emergency response and recovery capabilities. This type of investment tends to increase confidence in the private sector, and shows a commitment to resiliency.

## SOCIAL BENEFITS

This facility will increase the number of emergency shelters available helping to provide safe havens for vulnerable and high-risk populations. It should also allow for an improved capabilities by emergency operations personnel.

## PUBLIC SUPPORT

The public acknowledged throughout the planning process that the existing facility was inadequate for supporting the level of EOC-type operations that were undertaken during Hurricane Irene. An improved structure that provides adequate EOC operations space would improve the ability of Town officials to protect life and property.

## ADDITIONAL BENEFITS

The improved facility would provide better continuity of services by providing a place for Town officials, police, fire, emergency management, public works, and other departments during emergencies.

## Project Cost-Benefit Analysis

This project would benefit the Towns by improving the functionality and resiliency of government activities during a disaster. This project would improve the ability of emergency responders to protect life and property.

Based on available information and project details, this proposed project would benefit the Towns' safety, health, and welfare. Improvements in preparedness and disaster response collectively position the Towns, County, and other agencies to benefit from the project, as well.

Externalities that could potentially come about from this project are anticipated to be minimal for all but Town operations. There will be a direct and significant impact on Town operations, as administrative functions likely need to be housed in a temporary location during construction. Some type of arrangement for the Highway Department functions would need to be considered to ensure that daily operations can continue. This may necessitate phasing of construction to retain the existing truck bays, while constructing new ones.

## Implementation Time Frame

General project implementation, including hiring an architectural firm to design the building, could take place in 4 to 6 months. Construction of the new facility would then take an additional 6 to 9 months, for a total project timeline of 10 to 15 months.

## Regulatory Requirements

Completion of the proposed project may require local construction and building permits.





## Jurisdiction

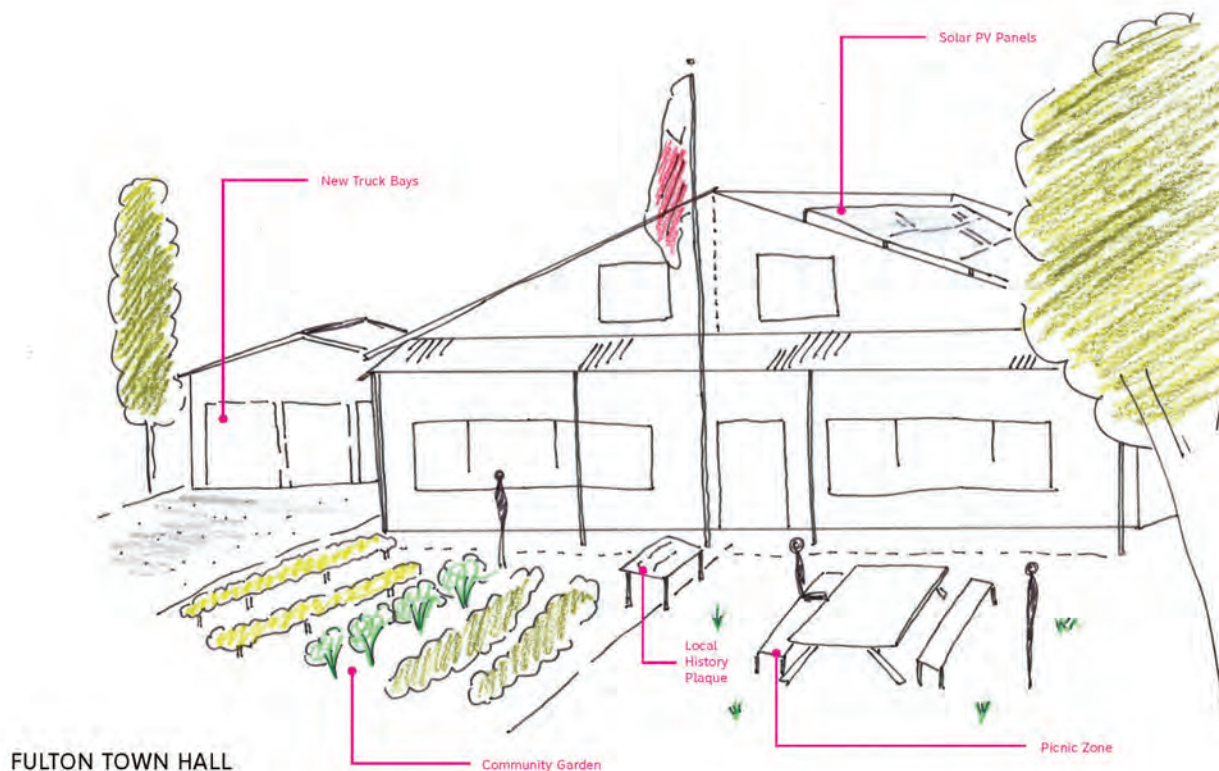
Jurisdiction for this proposed project rests with the Town of Fulton.

## SUMMARY

### Rebuild Fulton Town Hall to More Effectively Operate at the Town Emergency Operations Center

- Investment: \$1,535,005
- Assets protected: 1
- Jobs created: 12.9 FTE\*
- Strategies supported: 1, 2

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.



Artistic rendering of the proposed new Fulton Town Hall. Rendering is courtesy of SCAPE.



## Improve the West Fulton Fire Department (Proposed)

The West Fulton Fire Department serves as a primary shelter location in the Town of Fulton, and is the only Red Cross-certified shelter in the area. It is staffed by volunteers who consistently work to maintain public safety.



*Pictured here is the West Fulton Fire Department. Photo is courtesy of Raymond Adams.*

## Connection to the Disaster

Fire Department services are essential to disaster preparedness and public safety before, during, and after a disaster event. While it provided first responder duties, the Fire Department estimates that it housed 100 people in a space inadequately sized to service that number of people. After the storm was over, consensus was that the facility could use upgrades to better serve first responders and sheltered individuals.

## Project Description

The proposed project would upgrade and expand the current property and building, located at 807 West Fulton Road/County Route 4 in West Fulton, to provide additional capacity, and harden the property from events such as a power failure, that could render it unusable as a shelter.

Specific project elements are intended to improve the effectiveness, efficiency, and ability to deliver emergency response, shelter, and the distribution of supplies during an emergency.

## Components

- An addition to the building to allow for additional shelter space;
- Upgrades to heating and emergency lighting;
- Upgrades to the septic system and leach field to meet the needs of the expanded space;
- Redundant power (permanent generator/solar);

- Expanded parking designed to allow for better parking of vehicles, staging of equipment, and distribution of supplies;
  - A water storage unit; and
  - A cell tower repeater to increase cell coverage.
- These improvements will bring the Fire Department up to a level of potential service necessary to respond to major storm and emergency events.

These improvements should bring the Fire Department up to a level of potential service necessary to respond to major storm and emergency events.

## Regional Coordination

This is a local project that does not require regional coordination.

## Cost Estimate

The estimated total project cost is **\$1,095,908**.

## Project Benefits

This project will invest in a key community facility that will provide multiple health, safety, and welfare benefits, including risk reduction and increased public safety. The Fire Department performs multiple functions during an emergency and needs upgrades to meet future demands. As a Red Cross-Certified Shelter, it provides a level of care unavailable at many other





locations. Upgrades to the heating and emergency lighting are needed. To handle future large-scale emergencies, the structure needs additional space and basic necessities, such as back-up power.

This project aims to strengthen and prioritize local emergency response and recovery capabilities, and build a more resilient community by providing the space and capacity for equipment, sheltering, and emergency response operations.

### **FLOOD PROTECTION AND EMERGENCY RESPONSE**

Improvements to the Fire Department could have substantial safety and social benefits by upgrading a critical emergency response and shelter facility. As the only American Red Cross-certified shelter in the Community, the level of support provided is at the highest levels and this investment will increase resident and visitor safety during a disaster. This project should also improve emergency response capabilities.

The new facility would be designed to provide sheltering, improve existing facilities for both shelter and fire department activities, and improve cell phone communications. Given that the current structure is located outside the floodplain, no flood protection element is in place.

### **ANTICIPATED REDUCTION OF RISK**

Undertaking this project should result in a reduction to risk for the entire community by providing safe shelter to those in need, and by improving first responder communications and capacity.

### **SOCIAL BENEFITS**

This project could provide substantial safety and social benefits by upgrading a critical emergency response and shelter facility to allow for better functionality of the location, increased capacity for emergency response operations and shelter operations, and resiliency with back-up power.

### **ECONOMIC BENEFITS**

This project could encourage economic growth by spurring construction work and through the purchase of associated supplies and services.

### **PUBLIC SUPPORT**

The public acknowledged throughout the planning process that the existing facility should be expanded to provide sufficient space for sheltering at a level at least equal to what was provided during Hurricane Irene (100 residents). An improved structure that provides additional shelter space and improves fire department activities, while improving the separation of concurrent activities at the site, should improve the ability of the Fire Department to protect life and property.

### **ADDITIONAL BENEFITS**

Installing a cell tower repeater will provide increased cell phone coverage in the immediate vicinity of the Fire Department. If landline service is lost, cell service may still be available. A cell tower repeater will expand the ability to communicate outside the Towns.

## **Project Cost-Benefit Analysis**

This project would benefit the entire community by improving the functionality and resiliency of Fire Department activities. It would also improve the ability of emergency responders to react to a storm, thereby protecting life and property. In addition, the project should improve the conditions for those seeking shelter in the West Fulton Fire Department and improve safety on-site by better separating the multiple uses that take place during an emergency.

Externalities that could potentially come about from this project are anticipated to be minimal for emergency response related functions on the site. There should be direct and moderate impacts on non-emergency Fire Department operation functions, as the addition will likely be connected to the existing meeting and kitchen space. Upgrades to the heating and lighting functions



could necessitate moving emergency equipment from the bays to allow access to the system(s). This will require coordination and should not be done in the colder winter months.

Redesign of the parking and vehicular access will likely also require coordination with emergency and administrative needs, to ensure they can continue to function properly during construction. Finally, upgrades to the septic system will also likely require coordination, as there will be some amount of downtime on the indoor plumbing, as the new system is constructed/installed. This may require securing temporary outdoor bathroom facilities. These improvements will likely necessitate phasing of construction to coincide with the ongoing emergency and administrative functions of the Fire Department.

## Implementation Time Frame

General project implementation, including hiring an architectural firm to design the building expansion/addition, could take place in 2 to 4 months. Construction of the new facility would then take an additional 4 to 6 months, for a total project timeline of 6 to 10 months.

## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals for local construction and building permits. In addition, the project may require stormwater SPDES coverage.

## Jurisdiction

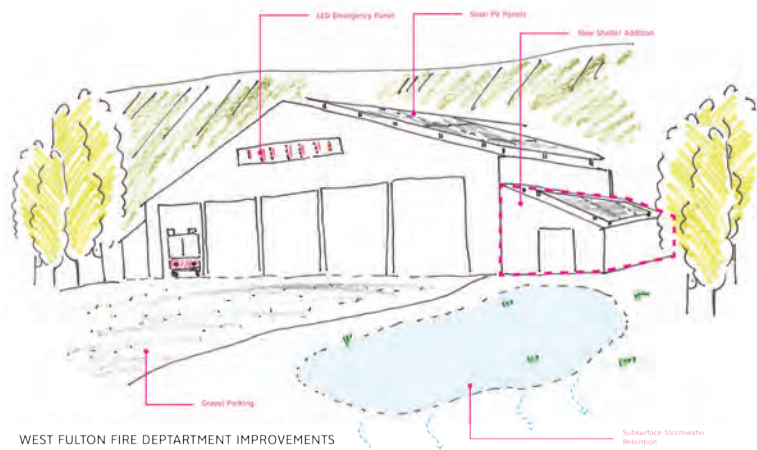
Jurisdiction for this proposed project rests with the West Fulton Fire Department.

## SUMMARY

### Improve the West Fulton Fire Department

- Investment: \$1,095,908
- Assets protected: All
- Jobs created: 9.2 FTE\*
- Strategies supported: 1, 2,

\*The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.



Artistic rendering of the envisioned West Fulton Fire Department Improvements. Rendering is courtesy of SCAPE.





## Undertake a Hydrology And Engineering Study of the Schoharie Creek and its Tributaries (Proposed)

The Schoharie Creek undergoes fluctuations in water flow regularly, and flooding is a somewhat common occurrence. However, the extent of flooding caused by Hurricane Irene was exceptional. The shape, depth, and character of the Schoharie Creek has changed over the years and has led to concerns about the movement of debris and sediment that has contributed to flooding.

### Connection to the Disaster

During Hurricane Irene, water moved everything from mud, sticks, trees, rocks, and boulders to vehicles, roads, houses, and farmland. Floodwaters profoundly changed the characteristics of the Schoharie Creek and its streambanks. There is concern that when the next flood event occurs, the Creek may not adequately handle the flow and velocity of water.

### Project Description

This project would involve a hydrologic and engineering study of the Schoharie Creek and some distance of each tributary. The purpose would be to assess the condition of the Creek, potential immediate concerns, longer-term actions, and an overall assessment of the Creek's capacity to handle future major storms.

Specific project work includes a hydrologic and engineering assessment of the Creek to:

- Determine conditions of the Creek and its tributaries (a minimum distance of 5,000 feet upstream from where they empty into the Schoharie Creek or the upstream limit of human impacts such as agriculture, logging, roads, homes, etc.), and recommend changes to existing conditions.



*Pictured here is the Schoharie Creek. Photo is courtesy of Raymond Adams.*

- Investigate the potential to add additional communities if funding and scope are feasible.
- Identify specific opportunities for stream restoration, floodplain reconnection, protection of agricultural soils, and other targeted efforts to improve stream function and reduce flooding.
- Specifically assess the streambank restoration needs behind and in proximity to the existing Blenheim Town Hall.

**This assessment will provide the engineering analysis to determine whether the movement of material in and around the Schoharie Creek and its tributaries has created condition(s) that need to be considered for remediation.**

### Regional Coordination

The Towns of Fulton and Blenheim have a long history of collaborating on a variety of issues, including in the wake of Hurricane Irene and Tropical Storm Lee. This project would require the input and participation of the Schoharie County EMO, and the Schoharie County Soil and Water Conservation District. It should also involve the Town and Village of Middleburgh.

### Cost Estimate

The estimated total project cost is **\$1,150,000**.



## Project Benefits

All residents and businesses in the Towns, as well as those downstream, should benefit from a better understanding of the stream conditions, issues, and potential fixes identified by this study.

### FLOOD PROTECTION AND EMERGENCY RESPONSE

This project has the potential to reduce the amount of damage caused by a flooding event, by assessing the existing conditions of the Creek, Creek bed, tributaries, and flow characteristics to more accurately portray existing conditions. The project would identify locations with potential issues and concerns, and detail potential options for fixing and managing the locations.

### ANTICIPATED REDUCTION OF RISK

Undertaking this project should result in the following positive risk reductions by:

- Providing a framework to identify and suggest management and improvements of locations that cause flooding; and
- Providing the Towns with a detailed assessment of options to undertake potential changes.

### ENVIRONMENTAL BENEFITS

This project should help improve stream function of locations identified during the study. The project should provide environmental benefits including increasing conveyance capacity and reduction of upstream water surface elevations, better management of stormwater runoff, improved water quality, protection of riverine ecosystems, and maintenance of natural characteristics.

### ECONOMIC BENEFITS

This study should help the area become more resilient against future storms, and reduce inundation of surrounding properties and transportation infrastructure. In turn, this should help to reduce any future maintenance or repair costs associated with flood damage. The project would also protect the existing commercial and agri-tourism infrastructure, while enhancing the recreational value of the Schoharie Creek.

### SOCIAL BENEFITS

Any potential reduction or mitigation of flooding in this Community provides a social benefit. Mitigation of potential flooding impacts has the potential to protect both life and property.

### PUBLIC SUPPORT

This project is focused on detailing the physical characteristics of the Schoharie Creek and addressing issues and conditions that explain why flooding occurs. Discussions related to undertaking a detailed hydrology study have been verbally supported by the Committee and the public.

## Project Cost-Benefit Analysis

Undertaking formal analysis and assessment of the Schoharie Creek should benefit the Towns by making them more resilient to future storms. It should improve the ability of the Towns, County, and State agencies to consider physical changes to the Schoharie Creek, its tributaries, and land impacted by Creek-related flooding. This planning and engineering assessment is essential to making the Towns more aware of existing problem areas. This proposed project would benefit public safety.





## Implementation Time Frame

General project implementation, including procurement of a consulting firm to undertake the analysis could occur within 6 to 10 months. Consideration should be given toward undertaking this study in the summer months when the Creek is most likely to be at its lowest flow levels, more easily allowing the engineers to see and record existing conditions.

agencies, including NYS DEC Protection of Waters Permit (Article 15), NYS DOT Highway Work Permit, and local construction and building permits.

## Jurisdiction

Jurisdiction for this proposed project is with the Town of Fulton and the Town of Blenheim, the U.S. Army Corps of Engineers, and the NYS DEC.

## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals from appropriate

## SUMMARY

### Undertake a Hydrology and Engineering Study of the Schoharie Creek and Its Tributaries

- Investment: \$1,150,000
- Assets protected: Many
- Jobs created: 12.6 FTE \*
- Strategies supported: 2, 4, 5

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.



## Replace Undersized Culverts (Proposed)

Hundreds of culverts are located in the Towns of Fulton and Blenheim. Many were damaged or destroyed, or did not function as required during Hurricane Irene. Many were repaired or replaced, but not all the primary culvert problem locations were corrected after the storm.

### Connection to the Disaster

Undersized culverts in both Fulton and Blenheim caused significant flooding issues during Hurricane Irene. Even culverts that were properly sized became plugged with stones and debris, causing flooding and property damage. Six existing culverts have been identified as flood-related problem locations during Hurricane Irene, as they did not function adequately. A team of hydrologists who studied those culverts concluded that they were not adequately sized to handle water flow during Irene.

### Project Description

This project would replace six existing, inadequate culverts with those sized to withstand a 1-percent annual flood/storm occurrence. Hydrologic analysis results show that the replaced culverts are undersized and are not anticipated to withstand a similar event. HEC-RAS models were not available for the tributaries in the Towns, so an alternative approach was used to evaluate the culverts.

The approach used USGS Streamstats to determine the 100-year flow at each culvert, and the Federal Highway Administration's HY-8 Culvert Analysis Program to determine appropriate sizing.

The six culvert replacement locations include:

- Bear Ladder Road
- Blenheim Hill Road
- Clauverwie Road
- Cole Hollow Road
- Dave Brown Mountain Road
- Spur Road

Replacing these culverts will remove an existing chokepoint and allow for the free flow of water in a 1-percent annual flood/storm.

### Bear Ladder Road 300 feet South of Spur Road

The HY-8 analysis indicates that the existing 54-inch diameter (16 sq-ft) HDPE culvert is insufficient to pass the estimated 100-year peak flow of 360 cubic feet per second (cfs). A proposed improvement involves installing a larger culvert to help convey, at a minimum, the 100-year peak flow and to help pass any large woody debris that could block the existing smaller culvert.

The recommended minimum cross sectional area is 54 square feet. Potential culvert types include, but are not limited to, a concrete box or corrugated metal pipe arch. This location has about 8 feet of freeboard between the top of the pipe and the crown of the road.



*Pictured here is a culvert on Bear Ladder Road. Photo is courtesy of Tetra Tech, Inc.*





## Blenheim Hill Road, 0.1 mile south of North Road



*Pictured here is the culvert on Blenheim Hill Road. Photo is courtesy of Tetra Tech, Inc.*

The HY-8 analysis indicates that a culvert with a cross sectional area of at least 200 square feet is required to pass the estimated 100-year peak flow of 960 cfs. A proposed improvement involves installing a structure larger than the existing 16' by 6' corrugated metal pipe arch to help convey, at a minimum, the 100-year peak flow and to help pass any large woody debris. Potential structure types include, but are not limited to a multiple barrel concrete box, corrugated metal pipe arch, or single span bridge.

## Clauverwie Road, 0.3 mile north of Armlin Hill Road



*Pictured here is a culvert on Clauverwie Road. Photo is courtesy of Tetra Tech, Inc.*

The HY-8 analysis indicates that a culvert with a cross sectional area of at least 40 square feet is required to pass the estimated 100-year peak flow of 260 cfs. A proposed improvement involves replacing the existing 48" corrugated metal culvert to help convey, at a minimum, the 100-year peak flow and to help pass any large woody debris. Potential culvert types include, but are not limited to, a concrete box or corrugated metal pipe arch.

## Cole Hollow Road, 600 feet west of Bear Ladder Road



*Pictured here is a culvert on Cole Hollow Road. Photo is courtesy of Tetra Tech, Inc.*

The HY-8 analysis indicates that the existing 9 x 13 foot (90 sq-ft) pipe arch culvert is insufficient to pass the estimated 100-year peak flow of 1,500 cfs. Additionally, the culvert is embedded by about two feet of cobbles, thereby reducing the effective cross section to about 75 square feet.

A proposed improvement involves installing a larger culvert to help convey, at a minimum, the 100-year peak flow and to help pass large woody debris that could block the existing smaller culvert. The recommended minimum cross sectional area is 380 square feet. This location has about 2 feet of freeboard between the top of the pipe and the crown of the road. Potential culvert types include, but are not limited to a multiple barrel concrete box, corrugated metal pipe arch, or a single span bridge.



## Dave Brown Mountain Road, 300 feet south of Windmill Lane



*Pictured here is a culvert on Dave Brown Mountain Road. Photo is courtesy of Tetra Tech, Inc.*

The HY-8 analysis indicates that the existing 78-inch diameter (33 sq-ft) steel pipe culvert is insufficient to pass the estimated 100-year peak flow of 390 cfs. A proposed improvement involves installing a larger culvert to help convey, at a minimum, the 100-year peak flow and to help pass any large woody debris that could block the existing smaller culvert. The recommended minimum cross sectional area is 55 square feet. Potential culvert types include, but are not limited to a concrete box or corrugated metal pipe arch. This location has about 2 feet of freeboard between the top of the pipe and the crown of the road.

## Spur Road, 0.15 mile west of Bear Ladder Road



*Pictured here is a culvert on Spur Road. Photo is courtesy of Tetra Tech, Inc.*

The HY-8 analysis indicates that the existing 60-inch diameter (20 sq-ft) HDPE culvert is insufficient to pass the estimated 100-year peak flow of 360 cfs. A proposed improvement involves installing a larger culvert to help convey, at a minimum, the 100-year peak flow and to help pass any large woody debris that could block the existing smaller culvert. The recommended minimum cross sectional area is 54 square feet. Potential culvert types include, but are not limited to, a concrete box or corrugated metal pipe arch. This location has about 3 feet of freeboard between the top of the pipe and the crown of the road.

## Regional Coordination

This is a local project that includes one community consisting of two municipalities and does not require regional coordination.

## Cost Estimate

The estimated total project cost is **\$1,200,189**.

## Project Benefits

### ANTICIPATED REDUCTION OF RISK

This project should provide several positive impacts to reduce risk, including inundation reduction for the six culvert replacement locations. This will help to provide more reliable and much needed transportation redundancy during storm events. Because the culverts are located on major connector and emergency evacuation routes, it is critically important to ensure these routes are safe for travel during storm events.





## ENVIRONMENTAL BENEFITS

This project would improve culvert functionality during flooding events by increasing the conveyance capacity and reducing the upstream water surface elevations. The improved structure would increase resiliency by reducing road inundation and the risk of streambank failure. It would also reduce the potential for ponding behind the culvert which could result in cutting of the streambank, increasing sediment load and reducing water quality, and damaging surrounding prime agricultural lands. The project would also help to maintain the natural characteristics of each waterway and the adjacent banks.

## ECONOMIC BENEFITS

These improvements should encourage economic growth spurred by increased construction purchasing and employment, and the use of associated supplies and services. The improvements should create a safer, more reliable transportation system and improve accessibility during times of flooding. In turn, this will likely increase individual property values over the long term. The reduction in road inundation and risk of streambank failure should help to reduce potential future maintenance, repair, and replacement costs associated with flood damage.

Several of these culverts are located on collector-type routes that are used daily by residents for evacuation. Reducing the potential for these culverts to flood, back-up water, and otherwise damage or close the road, reduces the risk of residents trying to navigate these areas. In addition, improvements aimed at building a more resilient transportation network should create greater confidence in the private sector, spurring more potential investment in the Towns.

## SOCIAL BENEFITS

Health and social benefits should be realized in several areas. This project should reduce the risk and potential for personal property damage and road closures on evacuation routes, thereby increasing personal safety and welfare at and near each culvert location and across the Towns.

## PUBLIC SUPPORT

This project is focused on physical improvements to culverts located along tributaries that contribute to the flooding issues throughout the Towns. Public input indicated that undersized culverts that cause flood-related problems should be replaced with appropriately sized culverts.

## ADDITIONAL BENEFITS

Upgrading these culverts to keep water flowing through them should reduce the potential for property damage upstream of each culvert.

## Project Cost-Benefit Analysis

This project would benefit the Towns by improving functionality and resiliency of six vital routes during times of flooding. This project would also improve the ability of culverts to handle the deluge of water presented in future major storms. It could potentially improve emergency response times by mitigating road flooding.

Externalities that could potentially come about from this project are anticipated to be moderate to significant, as the locations of culvert replacements and work required to undertake the replacements could require lane closures and detours. The specific externalities for each location will need to be determined during the design, management, and protection of traffic (MPT) assessment, but full road closures with detours could have a significant impact on travel throughout the region. Significant advanced notice of any road closures, excellent detour signage, and rapid re-opening would be helpful.

## Implementation Time Frame

The project would require hiring a construction firm to replace the culverts. Replacement of the culverts would take 4-6 months once the necessary permits are approved.

## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals from appropriate agencies, including USACE Nationwide Permit (NWP) and NYS DEC Section 401 Water Quality Certification (WQC), NYS DOT Highway Work Permit, and local construction and building permits.

## Jurisdiction

Jurisdiction for this proposed project rests with the Town of Fulton, Town of Blenheim and Schoharie County.

## SUMMARY

### Replace Undersized Culverts

- Investment: \$1,200,189
- Assets protected: 6
- Jobs created:10.1 FTE\*
- Strategies supported: 2

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.





## Incorporate Resiliency Measures Into the Bridge Schoolhouse Museum (Proposed)

The Bridge Schoolhouse Museum was one of 10 one-room schoolhouses in Blenheim prior to the establishment of the Gilboa-Conesville Central School District. The building was acquired by the Town and became the Firehouse/Town Hall until the Firehouse was relocated and the Museum was created.

### Connection to the Disaster

The Schoolhouse Museum is located adjacent to the former Blenheim Covered Bridge, which was washed away in the floodwaters. Floodwater entered the structure and damaged an addition added in 1958. Much of the flood damage came from behind the building from runoff off the mountain behind it. Within the Schoolhouse, the first four feet of wall was removed because concerns about damage and mold.

### Project Description

The proposed project would rehabilitate the damaged portions of the Schoolhouse Museum structure located on Eastside Road by incorporating resiliency measures into the rehabilitation process to make the structure less prone to flood damage from future storms.

This project will add resiliency and hardening measures to the rehabilitation effort. Specific elements will need to be further assessed through a detailed engineering review of existing building design and options for holding back potential future floodwaters that encroach the property. Recommended measures and repairs include:

- Demolition/disposal of the addition;
- Repairs to the Bridge Schoolhouse Museum;
- Restoration and wet flood-proofing; and
- Relocation of electrical and mechanical systems above flood elevation.



*Bridge Schoolhouse Museum signage. Photo is courtesy of Melissa Graham.*

**This project will help ensure that the work to rehabilitate the Schoolhouse Museum is protected from flooding caused by future storms.**

Additionally, the project would involve commissioning historic period details to enhance the structure. The Bridge Schoolhouse Museum is one part of the proposed Bridge Park enlargement project, which includes the reconstructed historic Blenheim Bridge, a riverwalk trail system, picnic area, gateway to North Blenheim, and interpretative signage relating to the historic sites.

### Regional Coordination

This is a local project that does not require regional coordination.

### Cost Estimate

The estimated total project cost is **\$132,374**.



Shown above, Bridge Schoolhouse Museum. Photo is courtesy of Raymond Adams.

## Project Benefits

The structure is a cultural and historic resource that has belonged to the Town of Blenheim for generations and is going to remain in its current location. The structure was surrounded by floodwater, and the first four feet of drywall was replaced, due to mold-related concerns. While the building would remain at-risk of flooding, the incorporation of hardening measures could reduce risk of additional flooding damage to the structure. Resiliency and hardening measures should help to ensure that this Town asset and tourist attraction is more resilient to future flooding events.

### FLOOD PROTECTION AND EMERGENCY RESPONSE

Improvements to the facility will be redesigned to make the structure more resilient to flooding related-issues.

### ANTICIPATED REDUCTION OF RISK

This project would result in a reduction of risk associated with potential damage to the structure and its critical systems, such as electrical and heating functions.

### ECONOMIC BENEFITS

Resiliency and hardening measures should help to ensure that the improvements and investment already made by Blenheim will not be compromised in future floods. The project will also enhance a tourist attraction that will add to the tourism economy of the Town.

### ADDITIONAL BENEFITS

Upgrading the building will help to protect the historic and cultural assets located within the building structure.





## Project Cost-Benefit Analysis

This project should benefit the region by preserving and protecting a unique and important cultural and historic resource. This project would protect the structure and its critical systems, such as electrical and heating.

No externalities are foreseen, as this project is effectively self-contained, the structure and grounds are not utilized on a regular basis, and it can be taken out of service with minimal or no impact on the Town.

## Implementation Time Frame

General project implementation, including hiring an engineering firm to design the building resiliency measures and completing the design, could take 4 to 6 months. Construction would then take an additional 2 to 3 months, for a total project timeline of 6 to 9 months.

## Regulatory Requirements

Completion of the Proposed Project may require regulatory and permitting approvals from appropriate agencies, including a NYS DOT Highway Work Permit, and local construction and building permits.

## Jurisdiction

Jurisdiction for this proposed project rests with the Town of Blenheim.

## SUMMARY

### Incorporate Resiliency Measures Into The Bridge Schoolhouse Museum

- Investment: \$132,374
- Assets protected: 1
- Jobs created: 1.1 FTE\*
- Strategies supported: 4

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.



## Incorporate Resiliency Measures into the New Community Center (Proposed)

The former Presbyterian Church was identified as a unique existing asset that was centrally located and able to easily be converted from a church to a community center. The North Blenheim Presbyterian Church, (formerly the Reformed Protestant Dutch Church of North Blenheim) is a Greek revival structure within the North Blenheim Historic District.

The building was donated to the Town of Blenheim, and an engineering firm assessed its structural integrity. Acquiring the site has ensured that the historic property and building will be preserved and rehabilitated, providing a much needed multi-purpose community center. Proposed within the multi-purpose center are a performance/exhibit space, a café, and space for a small business incubator and business classes. It is also envisioned to provide space for a visiting doctor.

## Connection to the Disaster

Floodwaters from Hurricane Irene surrounded the former Presbyterian Church and filled the basement, but did not enter the structure above ground. The property is located in an area designated as high risk for flooding and as such, is anticipated to flood again in a major storm. However, with the appropriate resiliency and hardening measures, the structure could be more resilient to potential impacts from floodwaters that reach the structure.

## Project Description

The proposed project supports the adaptive reuse of the historic structure into a community center, by incorporating resiliency measures into the rehabilitation process to make the recently-donated structure on State Route 30 less prone to flood damage from future storms.



*Old Presbyterian Church, side and front views. Photos are courtesy of Raymond Adams.*





This project will add resiliency and hardening measures to the rehabilitation effort. Specific elements related to flood-proofing will need to be assessed through a detailed engineering review of existing building design, and options for holding back potential future floodwaters.

Recommended hardening measures include:

- Restoration and wet flood-proofing; and
- Relocating the heating system out of the basement above flood elevation.

The structure and grounds are presently being upgraded and modified for their proposed use, and are not utilized for any formal or regular activity. The site and structure can be taken out of service with minimal or no impact to the Town.

**This project will help ensure that the work to rehabilitate and convert the Presbyterian Church to a multi-purpose Community Center is protected from flooding caused by future storms.**

## Regional Coordination

This is a local project that does not require regional coordination.

## Cost Estimate

The estimated total project cost is **\$253,253**.

## Project Benefits

This project can assist in taking an existing cultural resource in the Town and turning it into a multi-function community resource. Resiliency and hardening measures will help ensure that this recently-acquired community asset is not negatively impacted by future flooding events.

## FLOOD PROTECTION AND EMERGENCY RESPONSE

Improvements to the facility would be redesigned to make the structure more resilient to flooding-related issues.

## ANTICIPATED REDUCTION OF RISK

This project would result in a reduction of risk associated with potential damage to the structure and its heating system.

## ECONOMIC BENEFITS

Resiliency and hardening measures should help to ensure that the improvements and investment already made by Blenheim will not be compromised in future flood events. Thus, this would reduce the potential for future expenditures to fix, repair, and replace elements of this building.

## SOCIAL BENEFITS

The former Presbyterian Church was donated to the Town of Blenheim and is being redeveloped as a multi-use community center. This structure will provide the Town with a much-needed community gathering place that is centrally located in the heart of the North Blenheim Historic District.

## PUBLIC SUPPORT

The public voiced support for this project, as it is now a community-focused project being undertaken by the Town to improve the quality of life for residents. Since the structure is located in a high-risk area, improving resiliency is important.



## Project Cost-Benefit Analysis

This project would benefit the entire community by protecting a unique and important cultural, historic community resource through increase resiliency measures and improvements. This project would protect the structure and heating system, and help to ensure it can withstand future flood events.

## Implementation Time Frame

General project implementation, including hiring an engineering firm to design the building resiliency measures and completing the design, could take 4 to 6 months. Construction of the resiliency measures would then take an additional 2 to 3 months, for a total project timeline of 6 to 9 months.

## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals from appropriate agencies, including a NYS DOT Highway Work Permit and local construction and building permits.

## Jurisdiction

Jurisdiction for this proposed project rests with the Town of Blenheim.

# SUMMARY

## Incorporate Resiliency Measures into the New Community Center

- Investment: \$132,374
- Assets protected: 1
- Jobs created:1.1 FTE\*
- Strategies supported: 4

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending





## Become a Destination Corridor Between the Catskills and Adirondacks (Featured)

Tourism is a draw to the Schoharie Valley and to the Towns, but is not as significant an economic driver as it could be. Farm stands, recreational opportunities, and natural and cultural resources dot the landscape along Route 30, but the area has never been significantly touted as a tourism destination.

### Connection to the Disaster

Businesses throughout the Towns were severely impacted by flooding that inundated structures, knocked businesses out of service for days, or damaged property. Some businesses still have not fully recovered.

### Project Description

This project would increase the visibility of the Route 30 corridor as a primary north-south route with significant tourism and recreation opportunities in the Towns. The project would focus on the tourism and economic development-related needs of the Towns by:

- Developing a marketing and tourism strategy for the Towns as part of the larger Route 30 corridor;
- Working closely with regional “anchor” communities, and County, State, and private tourism-based agencies;
- Undertaking infrastructure improvements and enhancements, including:
  - Targeted improvements to streetscaping and enhancements to improve walkability in the historic and recreational locations;
  - Improvements to off-site signage and sign standardization;
  - Installation of signage for specific locations, such as including Vroman’s Nose, Looking Glass Pond, the Blenheim Covered Bridge, and trailheads;

- Seeking scenic byway designation; and
- Creating more exercise trails and on-road facilities for biking/walking/hiking.

This project would improve economic opportunities for tourism-related businesses that were hit Hurricane Irene flooding.

### Regional Coordination

While local in focus, this project would be part of a large-scale regional project, covering approximately 125 miles of the Route 30 corridor, from East Branch, NY to the southern end of Great Sacandaga Lake. The Towns have a long history of collaborating on a variety of issues and problems, especially in the wake of Hurricane Irene and Tropical Storm Lee.

This project would require the input and participation of the Schoharie County Chamber of Commerce, NYS I Love NY, and other tourism agencies. Ideally, it would include adjacent and distant municipalities along Route 30.

### Cost Estimate

The estimated total project cost is **\$1,125,000**.

### Project Benefits

This project will assist in making the Route 30 corridor, particularly in the Towns, a better-known destination for tourism and agri-tourism, among other types. The area has never been significantly touted as a tourism destination, and Hurricane Irene severely impacted businesses. This project should help to make businesses more resilient to the effects and costs typically associated with major storm events.



*Buildings along Route 30 in North Blenheim. Photo courtesy of Raymond Adams.*

### **FLOOD PROTECTION AND EMERGENCY RESPONSE**

As this is an economic development type of project, and there are no flood protection and emergency response benefits anticipated.

### **ANTICIPATED REDUCTION OF RISK**

As this is an economic development-focused project, the Consultant Team does not anticipate a direct reduction of risk.

### **ECONOMIC BENEFITS**

Increasing the business potential for the Towns (primarily through tourism) would help local businesses that rely on out-of-town spending to increase their potential sales and resiliency in the face of future disruptions caused by flooding.

### **PUBLIC SUPPORT**

Discussions about this project have focused on the need to support new and existing small businesses and agri-related businesses in the Towns. Because tourism assets and local businesses have never been significantly marketed in this area, the Towns felt this project has the potential to provide significant benefits related to economic stability and flood resiliency.

### **ADDITIONAL BENEFITS**

The project would assist in making retail-based businesses more resilient to potential storm-created down-time, by increasing overall economic stability through increased sales. Increasing the bottom-line of businesses could create jobs.





## Project Cost-Benefit Analysis

This proposed project can be expected to benefit economic stability of the Towns.

There are externalities from this project that need to be considered. There is some degree of uncertainty in the level of detail needed in any planning effort; however, basic project needs should be defined through a detailed project scoping process multiple governmental agencies.

## Implementation Time Frame

This is both a short- and long-term project would focus on promoting the Towns of Fulton and Blenheim within a much larger tourism-focused destination corridor. This multi-faceted project would likely require assistance of a consultant, coordination with many agencies, development of strategies, purchasing of new materials, and construction of physical improvements to the streetscape. Implementation of this project would take at least 18 to 24 months.

## Regulatory Requirements

It is anticipated that this project would not require regulatory or permitting approvals.

## Jurisdiction

The Town of Blenheim and Town of Fulton have jurisdiction for this project.

## SUMMARY

### Become a Destination Corridor Between the Catskills and Adirondacks

- Investment: \$1,125,000
- Jobs created: 9.45 FTE\*
- Strategies supported: 3

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending



## Undertake Slope Stabilization and Rock Slide Stabilization Efforts (Featured)

There are two locations within the Towns of Fulton and Blenheim that have significant slope and rock slide concerns. These locations can create significant issues when rock breaks loose and cutoff travel along a main north-south route. This perilous situation can create a serious hazard for motorists.

### Connection to the Disaster

Heavy rains and flooding from Hurricane Irene and Tropical Storm Lee caused rock slides and cracks, resulting in a dangerous situation that exacerbates issues caused by flooding.

### Project Description

This project would involve stabilization efforts at two identified locations, and any others identified prior to project implementation. The project proposes slope stabilization at two locations, and to consider needs of any other locations identified prior to starting this project. The two locations identified are along State Route 30 at the Fulton/Blenheim Town Line, and along Bear Ladder Road in Blenheim.

This project would help to remove potential impediments to safe travel during a flood or other natural disaster. Slide locations are considered by the community to be a repetitive safety concern and an emergency preparedness issue that should be addressed.

### Regional Coordination

This is a local project that would not require regional coordination. However, the potential impact on travel along Route 30 would require coordination with NYS DOT and Schoharie County, and should involve



*Landslides, one pictured above, are a frequent occurrence in the region. Photo is courtesy of Raymond Adams.*

coordination with the adjacent communities of Middleburgh and Gilboa, as detours or lane closures could impact travel to/from these communities. Coordination with Schoharie County and Middleburgh and Gilboa should also be undertaken for the work on Bear Ladder Road, due to the potential impacts detours or land closures could have in travel to and from these communities.

### Cost Estimate

The estimated total project cost is **\$400,000**.

### Project Benefits

This project would provide multiple benefits to the Towns, including risk and damage reduction, and economic, environmental, and social benefits. Heavy rains and flooding from Hurricane Irene and Tropical Storm Lee caused rock and slope slides. This is a dangerous situation when it occurs, and can exacerbate issues caused by flooding. The project would benefit





the entire population of Fulton and Blenheim, especially those residents and businesses that rely on slide-prone transportation routes during an emergency.

## **FLOOD PROTECTION AND EMERGENCY RESPONSE**

Reducing or removing the potential for these locations to create rock or slope slides would go far to ensure public safety and property protection.

## **ANTICIPATED REDUCTION OF RISK**

Risks associated with these locations includes their potential to jeopardize lives and damage property. Both locations are along important north-south routes in the Towns, which are used daily for travel and in many cases, during an emergency. Stabilizing these locations should reduce risk.

## **ENVIRONMENTAL BENEFITS**

The project would decrease the potential for future slides and result in a more stable hillside. Ultimately, this would reduce the potential for major rock and slope deterioration and subsequent erosion.

## **SOCIAL BENEFITS**

The risk of rock slides creates an additional unknown hazard for evacuees, emergency responders, and others traveling in the Towns. Roads have been closed at the two identified due to impassibility from debris.

## **PUBLIC SUPPORT**

Public support for this project has been positive. Committee members and the public realize the dangers presented at these two locations and the potential complications to traveling through the community if the slopes in these locations fail. This project was generally seen as a necessary but was not indicated to be a top priority as other projects are more pressing and provide greater benefits overall for the Community.

## **Project Cost-Benefit Analysis**

This project would benefit the Towns by stabilizing two potentially dangerous slope and rock slide locations, which could directly impact major north-south routes. It would improve the ability of these routes to remain open after a major storm, where the slope could become unstable. It could improve the conditions for emergency responders who can more assuredly rely on these particular routes to be open during flooding events.

This proposed project would benefit the Towns' safety, health, and welfare. Improvements that protect physical infrastructure from the impacts of flood events can benefit the Towns and other agencies, as well.

Externalities that could potentially come about from this project are anticipated to be moderate to significant, as the locations of slope and rock stabilization projects and the work required to undertake the stabilization could require lane closures and/or detours. The specific externalities for each location would need to be determined during the design and management and protection of traffic (MPT) assessment. Significant advanced notice of any road closures, excellent detour signage, and rapid re-opening of any closure would be important.

## **Implementation Time Frame**

General project implementation should include undertaking an engineering study to determine the extent of the stabilization needed at the two identified sites as well as other areas as appropriate. Following an engineering analysis, stabilization activities would commence. The engineering study, assessment and recommendations would take 2 to 3 months, and construction work to stabilize slopes an additional 2 to 3 months for the two sites already identified. Additional time will likely be necessary if additional locations are identified or the extent of the stabilization efforts are significantly more than anticipated. Total project timeline of 4 to 6 months is estimated to fix the issues related to the two identified locations.



## Regulatory Requirements

Completion of the proposed project may require regulatory and permitting approvals from appropriate agencies, including NYS DEC Section 401 Water Quality Certification (WQC), NYS DOT Highway Work Permit, and local permits.

## Jurisdiction

Jurisdiction for this proposed project rests with the Town of Fulton, Town of Blenheim, NYS DOT, and Schoharie County.

## SUMMARY

### Undertake Slope Stabilization and Rock Slide Stabilization Efforts

- Investment: \$1,125,000
- Jobs created: 9.45 FTE\*
- Strategies supported: 3

\* The FTE construction jobs were estimated based on a methodology developed by the U.S. Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.





## Develop a Local Stream Management and Maintenance Plan (Featured)

The Towns of Fulton and Blenheim have been undertaking stream management and maintenance initiatives on an as-needed basis, with assistance from Schoharie County, which has a comprehensive County-wide management and maintenance plan. These efforts have been successful in managing some of the worst maintenance issues in the past. However, the damage caused by Hurricane Irene-related flooding has magnified the scope and scale of management and maintenance.

### Connection to the Disaster

Floodwaters from Hurricane Irene overtook each creek, stream, and drainage channel in the Towns. Most waterways were damaged and impaired from significant floodwaters.

## Project Description

This project would develop a local stream management and maintenance plan for the Towns with the following activities:

- Complement ongoing, County-wide stream maintenance efforts.
- Provide a mechanism (plan) to identify and prioritize stream issues.
- Provide an outline of local strategies to address access, easement, permitting, and funding issues.
- Provide an educational component through educational materials to inform residents of available training and instruction programs regarding stream management and maintenance.

This project would help to ensure that the stream clean-up and future maintenance requirements are coordinated, comprehensive, and functional.



*Example of bank stabilization. Photo of boulders against bank courtesy of Tetra Tech, Inc.*



## Regional Coordination

This is a local project that includes one community consisting of two municipalities (Fulton and Blenheim). It would require coordination with the Schoharie County Soil and Water Conservation District.

## Cost Estimate

The estimated total project cost is **\$250,000**.

## Project Benefits

Some creeks, streams, drainage channels, and associated infrastructure worked as designed during Hurricane Irene. This project would create a comprehensive management and maintenance plan that details the full extent of damage done by Hurricane Irene, and would chart a path forward.

### FLOOD PROTECTION AND EMERGENCY RESPONSE

This project has the potential to reduce the amount of damage caused by a flooding event, by actively planning for and managing stream maintenance. This project would allow the Towns to better understand the magnitude of the issues, priorities for maintenance, and methods of mitigation.

### ANTICIPATED REDUCTION OF RISK

This project would result in several risk-reducing impacts, by:

- Implementing a plan that provides a framework for efficient, effective, coordinated, and comprehensive stream management to reduce the potential impacts from flooding; and
- Protecting residents, businesses, and property in the Towns, thereby reducing the risk to lives and property.

## ENVIRONMENTAL BENEFITS

Stream management and maintenance ensures that flows can proceed unimpeded. This project would increase the flow capacity of waterways, and enhance their ability to move floodwaters. The project would also help to maintain the natural characteristics of each waterway and adjacent banks.

## ECONOMIC BENEFITS

Routine maintenance should reduce the risk of streambank failure, resulting in a reduction of potential future maintenance, repair, and replacement costs associated with flood damage.

## ADDITIONAL BENEFITS

By having a well-defined and consistent management program, the Towns may be able to more cost effectively address issues related to stream management.

## Project Cost-Benefit Analysis

Undertaking a detailed stream management plan should improve the Towns' resilience against future storms. It should also improve the ability of Town officials to act in a more proactive, comprehensive and coordinated manner when it comes to managing streams, thereby protecting life and property of residents and businesses.

Based on available information and project details herein, this proposed project would benefit community safety and health, and environmental and economic needs.

There are externalities from this project that need to be considered. There is some degree of uncertainty in the level of detail needed in any planning effort; however, basic project needs must be fully defined through a detailed project scoping process that involves local officials and residents; and County, State, and possibly Federal agency representatives.





## Implementation Time Frame

This is both a short- and long-term project focused on stream management and maintenance needs in the Towns of Fulton and Blenheim. Completion of the plan would take 9 to 12 months. Stream management and maintenance will be an on-going effort in perpetuity.

## Jurisdiction

Jurisdiction for this proposed project rests with the Towns of Fulton and Blenheim.

## Regulatory Requirements

It is anticipated that the completion of this project will not require any regulatory or permitting approvals.

## SUMMARY

### Develop a Local Stream Management and Maintenance Plan

- Investment: \$250,000
- Assets protected: 1 - TBD
- Jobs created: 2.1 FTE \*
- Strategies supported: 2, 4, 5

\* The FTE construction jobs were estimated based on a methodology developed by the United States Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.





*Photo is courtesy of Raymond Adams.*



# Section 5

## Additional Materials



*Photo is courtesy of Raymond Adams.*





## Section 5: Additional Materials

### Additional Resiliency Recommendations

Table 5.1 lists the Additional Resiliency Recommendations determined by the NY Rising Community Reconstruction (NYRCR) Towns of Fulton and Blenheim Planning Committee (Committee).

**TABLE 5.1 – ADDITIONAL RESILIENCY RECOMMENDATIONS**

Strategy	Project Name	Short Description	Estimated Cost	Regional Project (Y/N)
2	Purchase Payloaders to Assist in Debris Removal During Storm Events	Purchase two payloaders (one for Fulton and one for Blenheim) to assist in the removal of debris during flood events, ice storms, and snow storms. These are considered first-response vehicles in flooding (and other) natural disasters. They can potentially be used in to carry personnel to remote or flooded locations, where a payloaders is one of the few vehicles large enough to traverse floodwaters or debris-filled terrain.	\$250,000	N
3	Create a Local Farmers and Artisans Market	Create a local farmers and artisans market in a single location or as a "linear market," utilizing existing (and future) farm stands to stimulate small business growth, support agri-business, and expand upon what already exists.	\$250,000	N
4	Determine the feasibility of Increased Water-Flow in the Schoharie Creek to Support Recreation	Work with New York Power Authority (NYPA) and New York City Department of Environmental Protection (NYC DEP) to determine feasibility and coordination of increased water-flow in the Schoharie Creek to support recreation. Investigate the potential for the new gates on the NYC DEP dam to provide the increased water flow and coordinate with NYPA, NYC DEP, and Dam Concerned Citizens, which is currently advocating increased water flow of 50-75 cubic feet per second (cfs) from June through September. Budget estimate is for administrative time necessary to conduct meetings and discussions with project partners.	\$15,000	Y
5	Assess the Potential to Participate in the National Flood Insurance Program's Community Rating System	Investigate willingness of communities to participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). Budget estimate is for administrative time necessary to conduct meetings and discussions with project partners to determine likelihood of participation.	\$15,000	Y
3	Investigate the Potential for Low-Cost Power from NYPA	Work with NYPA to investigate any potential low-cost power options for residents. Budget estimate is for administrative time necessary to conduct meetings and discussions with project partners.	\$25,000	N





**TABLE 5.1 – ADDITIONAL RESILIENCY RECOMMENDATIONS (CONT'D)**

Strategy	Project Name	Short Description	Estimated Cost	Regional Project (Y/N)
2	Elevate a Section of State Route 30	Elevate a 0.4-mile segment of State Route 30 by 4 feet (likely including construction of a retaining wall along the Schoharie Creek) between Blenheim Town Hall and the homes in North Blenheim.	\$1,000,000	N
2	Improve Cell Tower and High-Speed Internet Infrastructure	<ul style="list-style-type: none"> <li>Identify alternative options, such as Wi-Fi-based, in-home cellular extenders, individual homeowner cell-towers, and other telecommunications hardware, such as satellite-based communications.</li> <li>Identify alternative modes of communications in regions without communications coverage.</li> <li>Place signage along routes that do not have cellular coverage to warn travelers/residents of 'no-service' locations.</li> <li>Purchase satellite phones for use by emergency responders, when traditional lines of communication are unavailable.</li> </ul>	\$50,000	N
2	Undertake an Assessment of Hardening Needs to the Gas Pipeline	Implement a system for Enterprise Products Partners, LP, and public sector agencies to regularly inspect the pipeline, identify opportunities to implement protective measures for vulnerable elements, and rapidly identify damaged or compromised areas following a disaster.	\$50,000	N
4	Develop a Regional Parks and Recreation Master Plan	Develop a Regional Parks and Recreation Master Plan to better plan and coordinate parks and recreation resources.	\$125,000	Y
3	Implement Alternative Energy Projects	Develop a large-scale solar farm-based micro-grid to provide power to the Towns when the main grid goes down. A possible location includes the Summit Shock property.	\$1,000,000	N
3	Establish a Small Business Incubator to Support Existing Businesses, Especially Agri-business	Establish a small business incubator to support existing businesses, especially agri-business, and with a focus on agricultural needs, especially for the processing needs of local farmers who have to ship their goods out of the region for processing, and who could benefit from local services. Establish a purchasing co-op and encourage buying local where/when feasible.	\$125,000	N



## Master Table of Projects

**TABLE 5.2 – MASTER TABLE OF PROJECTS**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
1	Undertake Emergency Management Preparedness and Planning	<ul style="list-style-type: none"> <li>• Develop a regional, comprehensive Emergency Management Plan that (1) updates the emergency management planning as new facilities are developed; (2) ties-in with County and State efforts; (3) establishes a Pre-disaster Mitigation Program for community infrastructure, residences and residents, and businesses, and includes considerations to reduce flooding of important agricultural soils and encourage participation in the farm disaster preparation program with Cornell Cooperative Extension; (4) regional emergency response operations for all stakeholders including fire, emergency medical services (EMS), law enforcement, elected officials, public works departments and ensures integration with State, Federal, faith-based, non-governmental organizations (NGO)/not-for-profit (NFP) and faith-based organizations; and (5) a Regional Recovery Program, ensuring the current and future recovery programs are efficiently coordinated between stakeholders.</li> <li>• Conduct Evacuation Planning: Review existing evacuation plans (e.g., Dam Failure Evacuation Plans) and expand to include all hazards, ensuring whole community is considered.</li> <li>• Identify alternative locations for staging emergency equipment in the event of an anticipated flood.</li> <li>• Designate local shelter locations (including locations for animal evacuations on local farms) and evaluate shelter needs for redundant power generation and equipment stockpiles (e.g., cots, blankets, food supplies). Possible shelter locations include Breakabeen Grange, Gilboa School, Schoharie County Garage (Route 30), Blenheim Hill Church, a new location in the north-end of Fulton, West Fulton Fire Department, and the (New) Blenheim Town Hall. ☐ Undertake educational outreach on family and business preparedness, home and business mitigation, programs to strengthen the community, and benefits of modifying wellheads at risk of being covered by floodwater. Work with property owners to raise wellheads, where necessary and feasible.</li> <li>• Identify evacuation signage needs and key locations for “You are Here” maps and “No Cell Phone Coverage” signage.</li> </ul>	Proposed	\$550,000	Y





**TABLE 5.2 – MASTER TABLE OF PROJECTS (CONT'D)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
1	Provide Community Emergency Alert and Warning System and Support for Vulnerable Populations	<ul style="list-style-type: none"> <li>• Coordinate monitoring and alerting systems (public and private sectors, families and individuals, and functional needs and vulnerable populations).</li> <li>• Identifying and implementing technological solutions for monitoring not just the Schoharie Creek but upland area creeks and streams to alert citizens, emergency responders, vulnerable populations and travelers of emerging flooding situations (e.g., roadway and mountainside monitoring systems) and rockslides, road closures, etc.</li> <li>• Consider utilization of NY-Alert system (including public education campaign and assisting with registration).</li> <li>• Investigate better coordination and tie in between monitoring system(s) and alerts via sirens, phone calls, and other methods.</li> <li>• Coordinate a “Good Neighbor” check-in system, whereby neighbors volunteer to go door-to-door to check on each other and report to a central location (assuming communications are working).</li> <li>• Undertake a Community Services Needs Assessment to assess the local demand for health care, emergency services, transportation assistance and senior needs; to fund a community services coordinator position or provide funds for an existing agency to provide these services.</li> <li>• Work with the Schoharie County Emergency Management Office to identify methods to encourage residents with special needs to complete the Special Care Needs Voluntary Registration form.</li> <li>• Create a Volunteer Corps to provide emergency first-aid and support to displaced persons and vulnerable populations during a disaster.</li> <li>• Develop a public education campaign outlining designated evacuation routes, shelter locations, home emergency preparedness kits (to support self-sustainment), dam flood potential and related emergency actions, and how and when to shelter in place. Educate residents who do not evacuate about the potential for delayed assistance until it is safe for emergency personnel to reach their location.</li> </ul>	Proposed	\$750,000	Y

**TABLE 5.2 – MASTER TABLE OF PROJECTS (CONT'D)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
2	Construct a Blenheim Municipal Complex	Design the new building to include: <ul style="list-style-type: none"> <li>• Multipurpose space designed for Emergency Operations that can host meetings and other vital town functions;</li> <li>• Separate space for sheltering individuals and families to include a kitchen, full bathrooms and storage areas for equipment;</li> <li>• New facilities to house Blenheim Fire Department equipment;</li> <li>• New facilities to house Blenheim Highway Department equipment;</li> <li>• Redundant communications (e.g., Amateur [HAM] radio and satellite communications);</li> <li>• Redundant power generation (permanent generator, solar);</li> <li>• Electrical connections to allow charging of devices;</li> <li>• Adequate parking area for individual vehicles and staging of equipment;</li> <li>• Area for distribution of supplies; and</li> <li>• Construction of a protected well and dedicated water supply spigot to provide drinking water to residents.</li> </ul>	Proposed	\$2,999,417	N
2	Rebuild Fulton Town Hall to more effectively operate as the Town Emergency Operations Center	<ul style="list-style-type: none"> <li>• Complete necessary upgrades to allow the facility to properly operate as the Municipal Emergency Operations Command Center. These include:</li> <li>• An enlarged EOC/Town Hall with that incorporates all the elements needed to properly function as an EOC and Town Hall;</li> <li>• Redundant power generation (permanent generator, solar);</li> <li>• The upgrade of electrical connections to allow charging of devices;</li> <li>• The construction of a dedicated water supply spigot to provide drinking; and water to residents;</li> </ul>	Proposed	\$1,535,005	N
2	Improve the West Fulton Fire Department	<ul style="list-style-type: none"> <li>• Complete necessary upgrades to reduce conflicts between different emergency operations simultaneously underway at the facility to include:</li> <li>• Building addition to allow for additional shelter space;</li> <li>• Heating system and emergency lighting</li> <li>• Septic and leech field to meet needs of expanded space;</li> <li>• Solar panels;</li> <li>• Expand parking to allow for better parking of vehicles, staging of equipment, and distribution of supplies;</li> <li>• Redundant power (permanent generator, solar); and</li> <li>• Water storage unit (see above) (FD is looking into this right now).</li> </ul>	Proposed	\$1,095,908	N
2	Replace Undersized Culverts	Replace four existing culverts on Bear Ladder Road, Spur Road, Cole Hollow Road, and Dave Brown Mountain Road sized to withstand a 1-percent annual occurrence flood/storm. Hydrologic analysis results show that the replaced culverts are undersized and not anticipated to withstand a similar incident. Replace two culverts on Clauverwie Road and Blenheim Hill Road identified by Committee members as undersized or improperly designed.	Proposed	\$1,200,189	N





**TABLE 5.2 – MASTER TABLE OF PROJECTS (CONT'D)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
4	Undertake a Hydrology and Engineering Study of the Schoharie Creek and its Tributaries	Undertake a detailed hydrology and engineering study of the Schoharie Creek and tributaries a minimum of 5,000 feet upstream from where they empty into the Schoharie Creek or the upstream limit of human impacts (agriculture, logging, roads, and home sites). The study should incorporate the following: <ul style="list-style-type: none"> <li>Investigate the potential to add additional communities if funding and scope are feasible;</li> <li>This study should identify specific opportunities for stream restoration, floodplain reconnection, and protection of agricultural soils and other targeted efforts to improve stream function and reduce flooding; and</li> <li>Specific projects to be implemented for streambank restoration include behind Blenheim Town Hall and other projects identified during the study.</li> </ul>	Proposed	1,150,000	N
4	Incorporate Resiliency Measures into the Bridge Schoolhouse Museum	Incorporate resiliency measures into the Bridge Schoolhouse Museum restoration project (flood-proofing and hardening).	Proposed	\$132,374	N
4	Incorporate Resiliency Measures into the New Community Center	Incorporate resiliency measures into the new Community Center in the Old Presbyterian Church (engineering study and structural and hardening measures already studied).	Proposed	\$253,253	N
3	Become a Destination Corridor Between the Catskills and Adirondacks	Work to increase the visibility of the Route 30 corridor as a primary north-south route with significant tourism and recreation opportunities. This project will focus on needs in the Towns of Fulton and Blenheim including the following: <ul style="list-style-type: none"> <li>Develop a marketing and tourism strategy for the Planning Area and larger Route 30 area; and</li> <li>Work closely with regional 'anchor' communities, County and State agencies to become a destination corridor along Route 30 by undertaking infrastructure improvements and enhancements. Options to explore include (1) targeted improvements to the streetscaping and enhancements to improve walkability in the historic and recreational locations; (2) improved off-site signage and sign standardization; (3) install signage for specific locations, including Vromans' Nose, Looking Glass Pond, the Blenheim Bridge, and trailheads; (4) seek scenic byway designation; and (5) create more exercise trails and on-road facilities for biking/walking/hiking.</li> </ul>	Featured	\$1,125,000	Y
4	Undertake Slope Stabilization and Rock Slide Stabilization Efforts	Undertake stabilization efforts at two identified locations: along Route 30 and along Bear Ladder Road. Identify other potential slope stabilization locations for further consideration and assessment.	Featured	\$400,000	N

**TABLE 5.2 – MASTER TABLE OF PROJECTS (CONT'D)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
4	Develop a Local Stream Management and Maintenance Plan	Develop a local Stream Management and Maintenance Plan to complement on-going County-wide stream maintenance efforts. The plan will provide (1) a local focus, as a complementary activity to the on-going County stream maintenance efforts; (2) a mechanism for ongoing identification and prioritization of stream issues; (3) an outline of local strategies to address access, easement, permitting and funding issues; and (4) provide educational information on available programs regarding stream management and maintenance.	Featured	\$250,000	N
2	Purchase Payloaders to Assist in Debris Removal During Storm Events	Purchase two payloaders (one for Fulton and one for Blenheim) to assist in the removal of debris during flood events, ice storms, and snow storms. These are considered first-response vehicles in flooding (and other) natural disaster situations. They can potentially be used in to carry personnel to access remote or flooded locations where a payloaders is one of the few vehicles large enough to traverse floodwaters or debris-filled terrain.	Additional Resiliency Recommendation	\$250,000	N
3	Create a Local Farmers and Artisans Market	Create a local farmers and artisans market in a single location or as a "Linear Market" utilizing existing (and future) farm stands to stimulate small business growth, support agri-business and expand upon what already exists.	Additional Resiliency Recommendation	\$250,000	N
4	Determine the Feasibility of Increased Water-Flow in the Schoharie Creek to Support Recreation	Work with NYPA and NYC DEP to determine feasibility and coordination of increased water-flow in the Schoharie Creek to support recreation. Investigate the potential for the new gates on the NYC DEP dam to provide the increased water flow and coordinate with NYPA, NYC DEP, and Dam-Concerned Citizens, which is currently advocating increased water flow of 50-75 cfs from June through September. Budget estimate is for administrative time necessary to conduct meetings and discussions with project partners.	Additional Resiliency Recommendation	\$15,000	Y
5	Assess the Potential to Participate in the NFIP's CRS	Investigate willingness of communities to participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). Budget estimate is for administrative time necessary to conduct meetings and discussions with project partners to determine likelihood of participation.	Additional Resiliency Recommendation	\$15,000	Y
3	Investigate the Potential for Low-cost Power from NYPA	Work with NYPA to investigate any potential low-cost power options for residents. Budget estimate is for administrative time necessary to conduct meetings and discussions with project partners.	Additional Resiliency Recommendation	\$25,000	N
2	Elevate a Section of State Route 30	Elevate a 0.4-mile segment of State Route 30 by 4 feet (likely including construction of a retaining wall along the Schoharie Creek) between Blenheim Town Hall and the homes in North Blenheim.	Additional Resiliency Recommendation	\$1,000,000	N





**TABLE 5.2 – MASTER TABLE OF PROJECTS (CONT'D)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
2	Improve Cell Tower and High-Speed Internet Infrastructure	<ul style="list-style-type: none"> <li>Identify alternative options such as Wi-Fi-based in-home cellular extenders, individual homeowner cell-towers, and other telecommunications hardware such as satellite-based communications.</li> <li>Identify alternative modes of communications in regions without communications coverage.</li> <li>Place signage along routes that do not have cellular coverage to warn travelers/residents of 'no-service' locations.</li> <li>Purchase satellite phones for use by emergency responders when traditional lines of communication are unavailable.</li> </ul>	Additional Resiliency Recommendation	\$50,000	N
2	Undertake an Assessment of Hardening Needs to the Gas Pipeline	Implement a system for Enterprise Products Partners, LP and public sector agencies to regularly inspect the pipeline, identify opportunities to implement protective measures for vulnerable elements, and rapidly identify damaged or compromised areas following a disaster.	Additional Resiliency Recommendation	\$50,000	N
4	Develop a Regional Parks and Recreation Master Plan	Develop a Regional Parks and Recreation Master Plan to better plan and coordinate parks and recreation resources.	Additional Resiliency Recommendation	\$125,000	Y
3	Implement Alternative Energy Projects	Develop large-scale, solar, farm-based microgrid to provide power to the Towns when the main grid goes down. The Town of Fulton is currently trying to talk with the new owner of the Summit Shock property to discuss the potential to use that location.	Additional Resiliency Recommendation	\$1,000,000	N
3	Establish a Small Business Incubator to Support Existing Businesses, Especially Agri-business	Establish a small business incubator to support existing businesses, especially agri-business, and with a focus on agricultural needs, especially for the processing needs of local farmers who have to ship their goods out of the region for processing and who could benefit from such services locally. Establish a purchasing co-op and encourage buying local where/when feasible.	Additional Resiliency Recommendation	\$125,000	N



## Public Engagement for a Public Process

The public engagement process for the Towns of Fulton and Blenheim was essential to develop community-driven storm resiliency initiatives. Unquestionably, community collaboration and engagement are integral to recovery and resiliency efforts, from immediate post-disaster activities, to identifying and implementing projects that guard against future devastation from storms.

The targeted, multi-faceted outreach campaign in Fulton and Blenheim was based on traditional and electronic outreach methods, personal relationships between Committee members and their spheres of influence, and leveraging high-traffic venues for maximum message exposure.

## Information Gathering through Grassroots Efforts

The Committee solicited information and public opinions about the Towns' needs and opportunities relative to storm recovery and building resiliency against future storms. Public input about these needs and opportunities, in light of existing and non-existing resources, critical assets, and essential redundancies, was instrumental to the development of Proposed and Featured Projects, and Additional Resiliency Recommendations. The Committee also worked with area organizations and local municipal staff to obtain input on their needs and ongoing projects related to recovery and resiliency.

## Regular Planning Committee Meetings

Beginning in the summer of 2014, the Committee—comprised of local residents, businesspeople, and community organizational stakeholders—met biweekly to discuss issues and critical needs, vet prospective projects, and advance public outreach.



*Pictured here is the Towns of Fulton and Blenheim NYRCR Planning Committee at a regular biweekly meeting. Photo courtesy of Raymond Adams.*

## Public input was encouraged, and occurred regularly during biweekly Planning Committee Meetings.

All Planning Committee Meetings were held at the Fulton Town Hall or the Blenheim Town Hall, and were advertised on the NYRCR Program website and Facebook page.

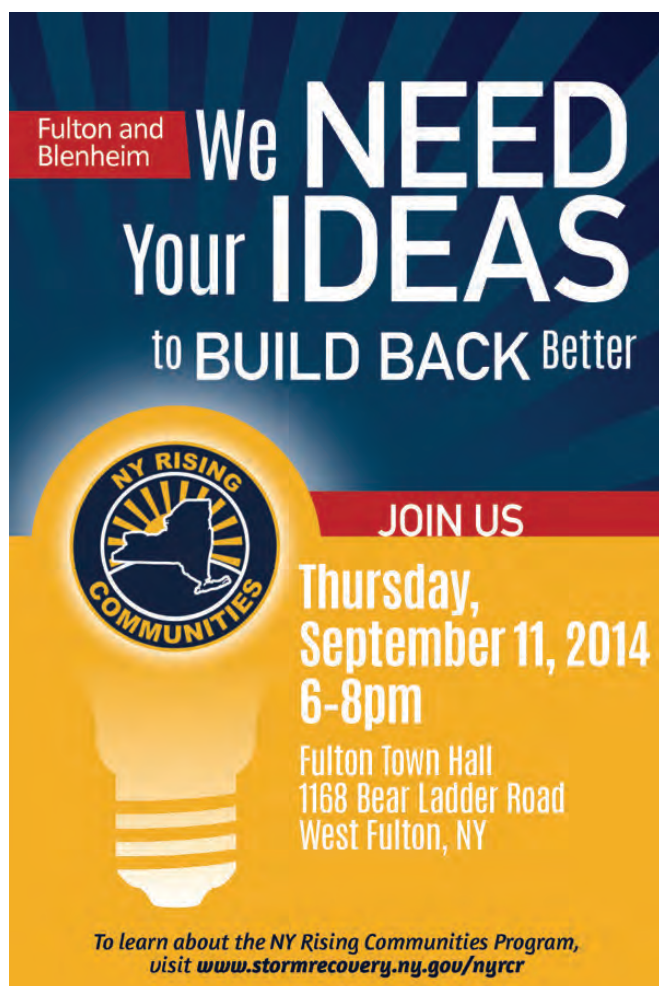
## Getting the Word Out

The Consultant Team's demographic profile of the Towns of Fulton and Blenheim NYRCR Planning Area, and conversations with the Committee, determined that a significant percentage of the residential target audiences for messaging included populations that get information on community events through traditional means, such as flyers, posters, and the newspaper.

Public outreach efforts incorporated the following variety of multi-media messages:

- Informational flyers and posters;
- Use of municipal and business community signage to advertise Public Engagement Events;
- Media alerts;
- Newspaper advertisements (print and online);
- E-mails that included meeting announcement information
- Social media, including a Committee Facebook page; and
- Website notifications.





Using an open-house format, the Committee invited attendees to communicate their ideas about unmet needs and opportunities for resolution.

Using maps of the two Towns, the public was asked to indicate problem areas related to both storm damage and potential opportunities for greater resiliency, with sticker dots and accompanying comment cards.

The second Public Engagement Event was held at the Fulton Town Hall and included an opportunity to discuss findings from the Risk Assessment, Consultant Team field work, and HEC-RAS analysis. This meeting provided an opportunity to gather input on resiliency strategies and projects.

The third Public Engagement Event was held at the West Fulton Fire Department. Advertised via print and electronic means, the Event showcased suggested projects and other recommendations for resiliency. Nearly 40 people were in attendance. The meeting included an overview of the NYRCR process and discussion of draft Proposed and Featured Projects, and Additional Resiliency Recommendations. Following the presentation and interactive discussion, there were additional opportunities for discussions during an open house. At the fourth and final Public Engagement Event, the final NYRCR Plan and Proposed, Featured Projects, and Additional Resiliency Recommendations was presented.

## Public Engagement Events

Four Public Engagement Events were conducted between August 2014 and January 2015 to (1) provide education about the NYRCR Program; (2) obtain input from the residents, property owners, and business owners; (3) to review projects; (4) share information based on public input, intelligence gathering, and planning and data analysis; and (5) review the draft and final Towns of Fulton and Blenheim NYRCR Plan.

The first Public Engagement Event was held in late July 2014 at the Blenheim Town Hall. State officials and the Consultant Team provided attendees with an overview of the NYRCR Program, while one of the Committee Co-chairs introduced the remaining Committee members to the attendees. The Vision Statement and goals developed by the Committee were also discussed.

### COMMENTS FROM PUBLIC ENGAGEMENT EVENT #3:

*"Good job of identifying key priorities...Overall the Committee has done a good job on our behalf to identify critical community needs."*

*"Thank you for your interest in our community. The Committee, along with your support, has brought up some really needed projects. Your presentation is very informative."*





Public Engagement Event #3. Photo of meeting courtesy of Tetra Tech, Inc.

# Towns of Fulton and Blenheim

## JOIN THE JOURNEY

to reduce future storm impacts and build resiliency

**Join Us and Learn About:**

- How you can participate
- What the community told us about flood impacts
- What the science told us about mitigation potential
- Recovery and resiliency projects being considered

For more information, visit [www.stormrecovery.ny.gov](http://www.stormrecovery.ny.gov)

**NY Rising Community Reconstruction Program Meeting**

**Thursday, November 6**

**6-8 pm**

**West Fulton Fire Department**  
**807 West Fulton Road/County Highway 4,**  
**West Fulton, NY**

Addressing storm impacts from Hurricane Irene and Tropical Storm Lee.





## Risk Assessment Methodology

The following discussion outlines the initial risk assessment process for Towns of Fulton and Blenheim NYRCR Plan. The analysis incorporated the baseline methodology, enhanced by specific assumptions at the request of the Committee. The baseline methodology included four major components of the analysis: Risk Area, the Hazard Factor, the Exposure Score, and the Vulnerability Score.

### Data Sources Used

The following sources of data from NYS DOS and Schoharie County utilized in the Risk Assessment are noted below.

#### NYS DOS-Provided Data

- Federal Communications Commission
- Insurance Services Office, Inc.
- National Oceanic and Atmospheric Administration (NOAA)
- Federal Communications Commission (2012)
- National Park Service (2011)
- National Pipeline Mapping System (2003)
- NYS Department of Health, NYS Department of Transportation
- NYS Division of Homeland Security and Emergency Services
- NYS Office for People With Developmental Disabilities
- NYS Office of General Services
- NYS Office of Mental Health
- NYS Department of Environmental Conservation (2009)
- NYS Education Department (2000)
- Environmental Systems Research Institute (ESRI) (2010).
- Schoharie County Data
- Parcels

- Tax Data
- Critical Facilities
- Natural Resources
- Infrastructure
- Soils
- Depth Grids
- Flood Hazard Areas (FHA)
- Buyout Properties
- Damaged Roadways
- Building Data
- Land Use
- Zoning

### Description of Methodology

The risk assessment for assets within the Towns of Fulton and Blenheim incorporated NYRCR baseline methodology. The baseline methodology included four major components of the analysis: the Risk Area, Hazard Factor, Exposure Score, and Vulnerability Score.

Risk area classifications (extreme, high, or moderate) are determined by the asset's location relative to mapped riverine risk zones.

#### Hazard Score

The hazard score of 3 was assigned for the hazard factor in the tool (100-year flood water level occurring within a 100-year planning time frame).

#### Exposure Score

The exposure score is determined by the sum of a base score (derived from the risk area in which the asset is located) plus 0.5 point for each of the six landscape feature conditions below, if present. A base score was assigned for Exposure to each asset depending on highest-class risk area (Extreme = 2, High = 1, and Moderate = 0.5) in which a significant portion of the asset is located. The total exposure score was calculated



for each asset by adding 0.5 point to the base score for each of the following conditions:

- **Defensive flood protection measures** - are absent, below base flood elevation (BFE), in poor condition, or lack maintenance commitment
- **Elevation** - the asset site is below BFE
- **Freeboard** - elevation of the habitable or occupied portion of the asset is less than 2 feet above BFE
- **Point of Confluence** - asset is within an area subject to increased flood risk (based on the Consultant Team's judgment) because of a confluence of merging streams
- **Stormwater Discharge** - asset is within an area subject to increased flood risk (consultants judgment or planning team guidance) because of stormwater system discharge
- **Vegetated Stream Bank Buffers** - asset is within Floodway Fringe (FEMA definition).

**TABLE 5.3 – VULNERABILITY BASED ON IMPACT ON SERVICE OR FUNCTION OF COMMUNITY ASSETS**

Impact	Insignificant 1	Minor 2	Moderate 3	Significant 4	Major 5
Economic Assets	Limited interruption in service or short-term reduced service	Service loss for up to 1 week or longer-term reduced services	Service loss for more than 1 week up to 1 month or longer-term reduced service	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of the economic asset
Health and Social Services Assets	Limited interruption in service or short-term reduced services; Services under more than usual stress but manageable	Service loss of up to 1 week or longer-term reduced services; Services under more than usual stress on several fronts	Service loss for more than 1 week up to 1 month or longer-term reduced service; Services under severe pressure	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of any one of the essential services listed
Housing Assets	Limited inconvenience	Out of use for up to 1 week	Out of use for more than 1 week up to 1 month	Out of use for up to 6 months (OR) permanent loss of 15% or less of housing in a group asset	Out of use for more than 6 months (OR) permanent loss of more than 15% of the housing in a group asset
Infrastructure System Assets	Limited interruption in service or short-term reduced service	Service loss for up to 1 week or longer-term reduced services	Out of use for more than 1 week up to 1 month or longer-term reduced service	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of any one of the facilities listed
Natural and Cultural Resources Assets	Limited interruption in service or short-term reduced service (OR) Limited loss of access, habitat, or use	Service loss for up to 1 week or longer term reduced services; Minimal natural habitat impacts, temporary loss of public access, temporary loss of open space/ tourism assets	Out of use for more than 1 week up to 1 month (OR) Moderate impacts on natural habitats, sustained loss of public access, long-term loss of private open space	Service loss greater than 1 month (OR) Permanently diminished capacity of natural resources; substantial damages of important natural habitat	Permanent loss of service of the cultural asset (OR) Complete loss of important natural habitats
Assets Providing Services for Socially Vulnerable Populations	Limited service interruption	Service loss for up to 1 week	Out of use for more than 1 week up to 1 month	Permanent service interruption of more than 1 and less than 6 months	Service interruption of 6 or more months





## Vulnerability Score

Table 5.3 outlines the methodology for calculating the vulnerability score, which accounts for an asset with a known length of time of service disruption or complete loss of service.

The methodology for assessing risk considered the unique situation and individual dynamics of areas at risk. To assess vulnerability, because asset-specific information on facility recovery times (after impact by a flooding event) was not available, standard assumptions based on similar facilities were used.

**A tiered-factor approach to assess risk, generating risk scores that accurately reflected vulnerabilities and overall risk within the Community was developed.**

The factor is adjusted based on similar facility types in a descending 5-point scale that is reduced by one point determined by its risk area location. For example, as noted in the vulnerability section below, all buildings were assumed to be 5 and all garages and storage buildings were assumed to be 4 in the high risk area but the vulnerability scores were reduced by 1 each to 4 and 3 respectively in the moderate risk area. Assumptions were reviewed and approved by the committee. The following assumptions were applied.

## Risk Area Assumptions

### 1. Risk Areas:

- Extreme risk areas: areas within the 100-year FHA that are within 1,000 feet of a Repetitive Loss Property.
- High risk areas: areas within the 100-year FHA.
- Moderate risk areas: areas within the 500-year FHA.
- "N/A" risk areas: areas outside of an identified FHA (all assets not located in an Extreme, High or Moderate Risk Area were identified as N/A, and do not produce a risk score. Assets in this category are given a risk score of "False" in the risk assessment tool).

### 2. Socially Vulnerable Populations:

Social Vulnerability Index (SOVI) measures the social vulnerability of populations to environmental hazards. Assets with a SOVI score of Medium or higher were identified as "Yes" in the Risk Assessment Tool.

## Assumptions for the Landscape Attributes and Vulnerability

### Landscape Attributes

- Defensive Flood Protection Measures:** all assets were assumed "Yes" if absent, below Base Flood Elevation (BFE), in poor condition, or lacking maintenance commitment.
- Elevation:** all assets outside the extreme, high, or moderate risk area were assumed "No," and all assets in the High and Moderate Hazard Zone were assumed "Yes" if the asset site is below BFE.
- Freeboard:** all assets outside the extreme, high, or moderate risk area were assumed "No," and all building, structure, and bridge assets in the extreme, high, and moderate risk areas were assumed "Yes" if elevation of the habitable or occupied portion of the asset is less than 2 feet above BFE.
- Point of Confluence (POC):** all assets within 1,500 feet downstream of major POC (this is a Hazard Mitigation Plan (HMP) dataset with all streams with 4,300 cubic feet per second [CFS] or more during a 100-year storm event) and within the extreme, high, or moderate risk areas are "Yes"; all others are "No."
- Storm Water Discharge:** all assets within 1,000 feet of a major culvert (HMP dataset) and within the extreme, high, or moderate risk areas are "Yes."
- Vegetated Stream Buffers:** all assets within the floodway are assumed "Yes"; all others "No."



## Assets in “Extreme” and “High” Risk Areas

### Vulnerability

1. All buildings were assumed to be 5.
2. All garages storage buildings were assumed to be 4.
3. All transportation infrastructure and water treatment facilities were assumed to be 3.
4. All wells and springs were assumed to be 2.
5. All natural and cultural resources other than buildings were assumed to be 2.
6. All natural resources were assumed to be 1.

2. Stormwater Discharge: “Yes” if the asset is affected by stormwater discharge and “No” if the asset is not affected. Comments justifying impact were provided where available.

Risk scores were generated for both the 100-year and 500-year event. While the risk scores differ between the two events as a result of using different hazard scores, the basis for how assets are categorized into the severe, high, moderate, or residual risk levels is the same for the two events, as shown by the similarly colored regions in Table 5.4. For example, a risk score of 60 in the 100-year event evaluation is shown as 80 in the 500-year event evaluation; however, both scores are classified as severe risk.

## Assets in the “Moderate” Risk Area

### Vulnerability

1. All buildings were assumed to be 4.
2. All garages storage buildings were assumed to be 3.
3. All transportation infrastructure and water treatment facilities were assumed to be 2.
4. All wells and springs were assumed to be 1.
5. All natural and cultural resources other than buildings were assumed to be 2.
6. All natural resources were assumed to be 1.

## Landscape Attributes

1. Point of Confluence: “Yes” if the asset is subject to increased flooding due to an upstream point of confluence, and “No” if the asset is not affected. Comments justifying impact were provided where available.



**TABLE 5.4 – RISK SCORE RANGES**

100-YEAR EVENT	500-YEAR EVENT
<b>Severe (Risk Score &gt;53)</b>	<b>Severe (Risk Score &gt;70)</b>
Risk scores in the “Severe” category occur only if one of the two factors, exposure or vulnerability, is rated 5, and the other is 4 or higher, which could indicate that the asset is in a dangerous situation. Both exposure and vulnerability should be reduced, if possible. Consider relocation a priority option for these assets.	
<b>High (Risk Score 24 - 53)</b>	<b>High (Risk Score 32 - 70)</b>
Risk scores in the “High” category are indicative of conditions that could lead to significant negative outcomes from a storm. Using the risk scoring system, a total of 24 (or 32 for the 500-year event) can be achieved only if the vulnerability is 4 and exposure is 2, or vice versa. A vulnerability of 4 indicates likely loss of service of an asset for an extended period of time. For many assets, this loss may be unacceptable. Actions should be taken to reduce vulnerability, such as elevating or floodproofing the asset to help avoid a long-term loss of function. A score of 4 for exposure indicates most of the local landscape attributes that help reduce storm damages are absent. Actions to restore landscape attributes may be appropriate. All other risk scores higher than 24 (or 32 for the 500-year event) indicate either the exposure or the vulnerability (or both) are higher than the conditions discussed above, lending more weight to need to take actions that reduce risk. Relocation may be necessary in the future if other means of adaptation or management actions are not effective.	
<b>Moderate (Risk Score 6 - 23)</b>	<b>Moderate (Risk Score 8 - 31)</b>
Risk scores in the “Moderate” category pose moderate to serious consequences, but adaptation may be of lower priority based on one factor, exposure, or because vulnerability remains relatively low. Use a combination of measures to reduce exposure and vulnerability.	
<b>Residual (Risk Score &lt;6)</b>	<b>Residual (Risk Score &lt;8)</b>
Risk scores in the “Residual” category occur when both exposure and vulnerability are relatively low. This situation suggests floods would pose minor or infrequent consequences. However, a vulnerability score of 3 may not be acceptable for critical facilities or assets of high community value, because the community cannot afford to be without these services, even infrequently. Note that risk is never completely eliminated. Some residual risk still remains even after management measures have been implemented. It is recommended that the community monitors conditions and adapts as necessary.	

Table 5.5 shows the Risk Assessment Tool inputs and results that were used to calculate risk scores for community assets for the Towns of Fulton and Blenheim NYRCR Plan. Components of the Tool include the Asset Name, Risk Area, Asset Class, and subcategory.

As discussed in Section 2, assets were also assigned attributes such community value, whether it is considered to be a critical facility, and whether the asset serves socially vulnerable populations. Assets were classified as either “critical” or “non-critical” facilities. Critical assets, are those that are essential to health and welfare of the whole population and if

severely damaged, would reduce the availability of essential community services necessary to cope with an emergency. Critical facilities may include emergency service facilities such as hospitals and other medical facilities, fire stations, public works facilities, evacuation shelters, schools, and other uses that house special needs populations. Other facility assets considered to be significant were categorized as “No, Locally Significant.” The Landscape Attributes as discussed above factor in to the Exposure Score. The Tool calculates the Risk Score from the Hazard Score, Exposure Score, and Vulnerability Score which are also listed in Table 5.5 for each asset.



TABLE 5.5 - RISK ASSESSMENT TOOL

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Max V. Shaul State Park/Campground	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Mine Kill State Park And Trails	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	1	0	4	FALSE	1	0
Blenheim Town Hall Park	High	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	No	Yes	No	No	1.5	3	2.50	2	15	4	2.50	2	20
Blenheim Covered Bridge And Park	High	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	2	9	4	1.50	2	12
Valley Soccer Complex	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	1	0	4	FALSE	1	0
Town Of Fulton Historical Society Town Park	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Gauge Bkbn6 (Schoharie Creek Gauge)	High	Infrastructure Systems	Stormwater	Yes	No, Locally Significant	High	Yes	No	No	No	No	No	0.5	3	1.50	1	5	4	1.50	1	6
Bridge Crossing County Road 53 Keyserkill Creek	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing Bear Ladder Road Cole Hollow Brook	Moderate	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.00	2	6	4	1.00	2	8
Bridge Crossing Creamery Road West Kill Creek	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing County Road 2 Mill Creek- 1.5 Miles West Of N Blenheim	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing County Road 2 Mill Creek- 2.5 Miles West Of North Blenheim	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0





TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Bridge Crossing County Road 2 Mill Creek - 2.5 Miles West Of North Blenheim	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing Goody Road Panther Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing County Road 4 Panther Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing Patria Road House Creek	N/A	Infrastructure Systems	Transportation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing County Road 4 Tributary Of House Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing County Road 4 House Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing West Fulton Road C4 House Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing Westkill Creek	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	Yes	No	No	1	3	2.00	3	18	4	2.00	3	24
Bridge Crossing Brn Schoharie Creek	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing Keyserkill Creek	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing Schoharie Creek - 9.9 Miles Sw Of Routes 30/145	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	Yes	No	No	No	No	1	3	2.00	3	18	4	2.00	3	24
Bridge Crossing Panther Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing Pleasant Valley Creek	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Bridge Crossing Line Creek	Extreme	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	Yes	No	No	Yes	1.5	3	3.50	3	32	4	3.50	3	42



TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Bridge Crossing Schoharie Creek - 6.0 Miles SW of Routes 30/145	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	Yes	No	No	1	3	2.00	3	18	4	2.00	3	24
Bridge Crossing Schoharie Creek - 5 Miles SW of Routes 30/145	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing Devils Run	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing Schoharie Creek - 9.1 Miles NE of Delaware Cl	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.50	3	14	4	1.50	3	18
Bridge Crossing Pleasant Valley Rd Tributary of Schoharie Creek	N/A	Infrastructure Systems	Transportation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
U.s. Post Office - Fultonham	N/A	Health and Social Services	Government and Administrative Services	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
U.s. Post Office - North Blenheim	High	Health and Social Services	Government and Administrative Services	Yes	No	High	Yes	Yes	No	Yes	No	No	1.5	3	2.50	5	38	4	2.50	5	50
U.s. Post Office - West Fulton	N/A	Health and Social Services	Government and Administrative Services	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Camp Summit	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Schoharie #3 - Burnt-Rossman Hills State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #4 - Burnt-Rossman Hills State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #5 - Burnt-Rossman Hills State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #6 - Burnt-Rossman Hills State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0





TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Schoharie #7 - Mallet Pond State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #9 - Burnt-Rossman Hills State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #18 - Patria State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #20 - Petersburg State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #21 - Blenheim Hill State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Schoharie #22 - Armlin Hill State Forest	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Petersburg Mountain Radio Facility	N/A	Infrastructure Systems	Telecommunications	Yes	No, Locally Significant	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
NYS Summit Shock Correctional Facility/ Camp Summit	N/A	Health and Social Services	Government and Administrative Services	Yes	No, Locally Significant	Low	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Schoharie Creek	High	Natural and Cultural Resources	Water Bodies	Yes	No	High	Yes	Yes	No	No	No	No	1	3	2.00	2	12	4	2.00	2	16
Line Creek	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Panther Creek	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Keyser Kill	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	High	Yes	Yes	No	No	No	No	1	3	FALSE	1	0	4	FALSE	1	0
West Kill	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0



TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Mine Kill	High	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2.00	2	12	4	2.00	2	16
House Creek	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Heather Creek	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Mill Brook	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Betty Brook	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Stony Creek	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Town Hall of Blenheim	High	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	Yes	Yes	No	Yes	No	No	1.5	3	2.50	5	38	4	2.50	5	50
Fire Department Of Blenheim	High	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	Yes	No	Yes	No	No	1.5	3	2.50	5	38	4	2.50	5	50
Fulton Town Hall	N/A	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
West Fulton Fire Department	N/A	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Looking Glass Pond	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Mallet Pond	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0





TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	High	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2.00	2	12	4	2.00	2	16
Wetlands and Marshes	High	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2.00	2	12	4	2.00	2	16



TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Wetlands and Marshes	N/A	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Ball Field, Route 30 Breakabeen	High	Natural and Cultural Resources	Agricultural areas	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	1.50	2	9	4	1.50	2	12
Barber's Farm	N/A	Economic	Small Business	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	3	0	4	FALSE	3	0
Bellinger's Saw Mill	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Blenheim Hill Farm	N/A	Natural and Cultural Resources	Agricultural areas	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Blenheim Pharmacal, Inc.	N/A	Economic	Small Business	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	3	0	4	FALSE	3	0
Blenheim-Gilboa Pumped Power Storage Project	N/A	Infrastructure Systems	Power Supply	Yes	No	High	Yes	Yes	No	No	No	No	1	3	FALSE	2	0	4	FALSE	2	0
Blenheim-Gilboa Visitors Center	N/A	Natural and Cultural Resources	Museums, Performing Arts Centers, and Stadiums	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Bohringer's Fruit Farm	Moderate	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	1.00	5	15	4	1.00	5	20
Breakabeen Food Pantry	N/A	Health and Social Services	Healthcare Facilities	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Breakabeen General Store and Liquor Store	N/A	Economic	Small Business	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Breakabeen Presbyterian Church	N/A	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Coons Excavating	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0





TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Elkhund Woodworks	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Frank Lacko Farm	High	Economic	Small Business	Yes	No	High	Yes	No	No	No	No	No	0.5	3	1.5	5	22.5	4	1.5	5	30
Fulton Park/ Parking Area on Route 30	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
L&L Logging	High	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	1.5	5	22.5	4	1.5	5	30
Lansing Manor House	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Mattice's Riverbank Farm	N/A	Economic	Small Business	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	3	0	4	FALSE	3	0
Methodist Church	High	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2	5	30	4	2	5	40
Old Presbyterian Church	High	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2	5	30	4	2	5	40
North Blenheim Fishing Access (Dec)	High	Natural and Cultural Resources	Hunting and Fishing Lands	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2	2	12	4	2	2	16
Octagon House	High	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2	5	30	4	2	5	40
Royal Oak Farm (Wilson's Farm)	N/A	Economic	Small Business	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Schoharie County Depot	N/A	Infrastructure Systems	Transportation	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Schoolhouse Museum	Moderate	Natural and Cultural Resources	Museums, Performing Arts Centers, and Stadiums	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	1	4	12	4	1	4	16
Shaul Farms	N/A	Economic	Small Business	Yes	No	High	Yes	Yes	No	No	No	No	1	3	FALSE	3	0	4	FALSE	3	0
Shaul's Roofing	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Skowfoe Well Drilling/ Dumpsters West Fulton	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Smyth's Pottery	N/A	Economic	Small Business	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	3	0	4	FALSE	3	0
Southwest Connections Used Cars Fultonham	N/A	Economic	Small Business	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0



TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
The Waterfall House	N/A	Economic	Small Business	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Town of Blenheim Highway Department	Moderate	Infrastructure Systems	Transportation	Yes	No	High	Yes	Yes	No	No	No	No	1	3	1.5	2	9	4	1.5	2	12
Trombley's Auto Repair	N/A	Economic	Small Business	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	4	0	4	FALSE	4	0
Under the Nose, Mymobie, Qmodeling Mill Valley Road	High	Economic	Small Business	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	1.5	5	22.5	4	1.5	5	30
Vroman's Nose Information Center	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Vroman's Nose Preservation Corporation and Trail	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	1	0	4	FALSE	1	0
Wayman's Auction Barn Fultonham	N/A	Economic	Small Business	Yes	No	Low	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
West Fulton Methodist Church	N/A	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Wilderhook Syrup	Extreme	Economic	Small Business	Yes	No	Medium	Yes	Yes	Yes	No	No	Yes	2	3	4	5	60	4	4	5	80
Cole Brook	N/A	Natural and Cultural Resources	Water Bodies	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Long Path	N/A	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Propane Gas Line	N/A	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	Yes	No	No	No	No	No	0.5	3	FALSE	2	0	4	FALSE	2	0
Armlin Hill Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Breakabeen Cemetery Association	Moderate	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	1.5	2	9	4	1.5	2	12
Breakabeen Grange Hall	N/A	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0





TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Brimstone Church	N/A	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Brookworks, LLC	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Champlin Burial Plot	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Dibble Hollow Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Freemeyer Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Fulton Hill Cemetery Association	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Fultonham Ice Cream Shop	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
H W Ploss Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Head Start Child Development	High	Health and Social Services	Daycare and Eldercare	Yes	Yes, FEMA	Medium	Yes	Yes	No	No	No	No	1	3	2	5	30	4	2	5	40
Loveland Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Mckenna Machine Shop	Moderate	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	1	4	12	4	1	4	16
Parsdale Farm	N/A	Economic	Small Business	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	3	0	4	FALSE	3	0
Patchin Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Patria Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Patria Gardens	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Peaslie Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0



TABLE 5.5 - RISK ASSESSMENT TOOL (CONT'D)

Asset Information							Landscape Attributes							Risk Assessment				Table 5.5 - Risk Assessment Tool Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-Category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Stormwater Discharge	Vegetated Streambank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
River View Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Rossman Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Rossman Hill Cemetery	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Rossman Hill Cemetery Assn	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	1	0	4	FALSE	1	0
Sap Bush Hollow Farms	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Shaul Excavating	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
St. Paul's Episcopal Church	Extreme	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	Yes	No	No	Yes	2	3	4	5	60	4	4	5	80
Swanberry Sculptures West Fulton	N/A	Economic	Small Business	Yes	No	Medium	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
Town of Fulton Highway Barn	N/A	Health and Social Services	Government and Administrative Services	Yes	No	High	Yes	No	No	No	No	No	0.5	3	FALSE	3	0	4	FALSE	3	0
North Blenheim Historic District	High	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	Yes, FEMA	Medium	Yes	Yes	No	No	No	No	1	3	2	5	30	4	2	5	40
Breakabeen Historic District	N/A	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	FALSE	1	0	4	FALSE	1	0





## GLOSSARY

ACS	American Community Survey
BFE	Base Flood Elevation
BMP	Best-Management Practices
CDBG	Community Development Block Grant
CDBG-DR	Community Development Block Grant Disaster Recovery
CFA	Consolidated Funding Application
cfs	Cubic Feet Per Second
Committee	NYRCR Towns of Fulton and Blenheim Planning Committee
Community	Towns of Fulton and Blenheim Communities
CRS	Community Ratings System
EMO	Emergency Management Office
EMS	Emergency medical services
EOC	Emergency Operations Center
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHA	Flood Hazard Area
FTE	Full-Time Equivalent
GIS	Geographic Information System
GOSR	Governor's Office of Storm Recovery
HAM	Amateur Radio
HEC-RAS	Hydrologic Engineering Center - River Analysis System
N/A	Not applicable
NDRF	National Disaster Recovery Framework
NFIP	National Flood Insurance Program
NFP	Not For Profit



## GLOSSARY

NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NWP	Nationwide Permit
NYC DEP	New York City Department of Environmental Protection
NYPA	New York Power Authority
NYRCR	New York Rising Community Reconstruction
NYRCR Plan	Towns of Fulton and Blenheim New York Rising Community Reconstruction Plan
NYS	New York State
NYS DEC	New York State Department of Environmental Conservation
NYS DOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Resource and Development Authority
NYSEG	New York State Electric and Gas Corporation
RSF	Recovery Support Function
SART	State Agency Review Team
SOVI	Social Vulnerability Index
sq. mi.	Square Mile
TBD	To Be Determined
Towns	Towns of Fulton and Blenheim
TPA	Tourism Promotions Agency
USACE	U.S. Army Corps of Engineers
UofSC	University of South Carolina
USGS	U.S. Geological Survey
WQC	Water Quality Certification





## Endnotes

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