

9.2 Town of Caroline

This section presents the jurisdictional annex for the Town of Caroline. It includes resources and information to assist public and private sectors to reduce losses from future hazard events. This annex is not guidance of what to do when a disaster occurs. Rather, this annex concentrates on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. This annex includes a general overview of the Town of Caroline and who in the Town participated in the planning process; an assessment of the Town of Caroline’s risk and vulnerability; the different capabilities utilized in the Town ; and an action plan that will be implemented to achieve a more resilient community.

9.2.1 Hazard Mitigation Planning Team

The following individuals have been identified as the Town of Caroline’s hazard mitigation plan primary and alternate points of contact.

Table 9.2-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Mark Witmer, Supervisor Address: 2670 Slaterville Road, Slaterville Springs, NY 14881 Phone Number: 607-539-6400 Email: supervisor@townofcaroline.org	Name/Title: Barry Goodrich, Stormwater Coalition Representative Address: 2670 Slaterville Road, Slaterville Springs, NY 14881 Phone Number: 607-227-2696 Email: codeofficer@townofcaroline.org
NFIP Floodplain Administrator	
Name/Title: Cory Williams, Code Officer and Stormwater Manager Address: 2670 Slaterville Road, Slaterville Springs, NY 14881 Phone Number: 607-539-6400 Email: codeofficer@townofcaroline.org	

9.2.2 Municipal Profile

The Town of Caroline is located Southeast of the Town of Ithaca, in Tompkins County, New York. The town’s total area is 55 square miles, and is made up of rolling hills, farms, and several small communities. Caroline borders Tioga County to the east and south. New York State Route 79 crosses through the northern part of the town. Caroline is home to many State forest lands, including Shindagin Hollow State Forest, Potato Hill State Forest, Hammond Hill State Forest, and Robinson Hollow State Forest.

Previously land of the Iroquois peoples, Caroline was part of the Watkins and Flint Purchase of 1791, and first settled in 1794. Formed from the Town of Spencer in Tioga County, Caroline was incorporated as a Town in 1811. Multiple churches in Caroline are listed on the National Register of Historic Places.



In 2004, Caroline became the 8th municipality in New York State to purchase wind power to provide part of municipal electric needs. By 2005, it purchased wind power for 100% of municipal electricity use. In 2008, volunteers coordinated the largest single-day distribution of energy-saving lightbulbs in rural New York, distributing over 1,400 lightbulbs to almost every household in the town. The majority of Caroline residents commute to the Ithaca area for work.

The Caroline Town Council (aka Town Board) is made up of four elected representatives serving 4-year terms. Town Council members include the Town Superintendent, Clerk, Highway Superintendent, and Justices. The offices of Building Codes and Historian are appointed by the Town Council. The Town Supervisor is responsible for routine administration and will act as the treasurer, pay salaries, and sell or lease land as directed by the town board. The Town Board is responsible for all legislation, adoption of town budgets, personnel matters, and the adoption of the Town Comprehensive Plan.

According to the American Community Survey, the town of Caroline has a population of 3,362.

9.2.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction’s overall risk to its hazards of concern. Table 9.2-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.2-1 at the end of this annex illustrates the geographically delineated hazard areas and the location of potential new development, where available.

Table 9.2-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP* (within regulatory floodplain/ Outside regulatory floodplain)										
	Total	Within SFHA	Total	Within SFHA	Total	Within SFHA	Total	Within SFHA	Total	Within SFHA
Single Family	9	0	6	0	8	0	6	0	11	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	14	0	1	0	0	0	1	0	1	0
Total	23	0	7	0	8	0	7	0	12	0
Property or Development Name	Type of Development	# of Units / Structures		Location (address and/or block and lot)		Known Hazard Zone(s)*		Description / Status of Development		
Recent Major Development and Infrastructure from 2014 to Present										
Boiceville Cottages	Subdivision	140 Rental cottages, 1-2 bedroom		301 Boiceville Rd., Brooktondale, NY 14817				complete		



Type of Development	2015	2016	2017	2018	2019
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None Indicated					

SFHA Special Flood Hazard Area (1% flood event)
* Only location-specific hazard zones or vulnerabilities identified.

9.2.4 Capability Assessment

The Town of Caroline performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of planning, legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of administrative and technical capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Classification under various community mitigation programs.
- The community’s adaptive capacity for the impacts of climate change.
- Information on National Flood Insurance Program (NFIP) compliance.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized in Capability Assessment (Section 9.2.4). The Town of Caroline identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy. **This is shown in bold text in the comments box where appropriate.** Appendix I provides the results of the planning/policy document review.

9.2.4.1 Planning, Legal, and Regulatory Capability

The table below summarizes the regulatory tools that are available to the Town of Caroline and where hazard mitigation has been integrated.



Table 9.2-3. Planning, Legal, and Regulatory Capability

	Does your municipality have this? (Yes/No)	Code Citation and Date (code chapter, name, date, link)	Authority (local, Town, state, federal)	Department / Agency Responsible	State Mandated
Codes, Ordinances, & Requirements					
Building Code	Yes	The Uniform Code (19 NYCRR Parts 1219 to 1229)	Local	Local Code Department	Yes
Comments: NYS Uniform and Energy Code 2020; Regulated at local and state levels. The Uniform Code (19 NYCRR Parts 1219 to 1229) now includes the 2015 editions of the code books published by the International Code Council (the "2015 I-Codes"), as amended by the publication entitled the 2017 Uniform Code Supplement (publication date: July 2017).. Article 18 of the Executive Law (§§ 370 through 383) establishes the State Fire Prevention and Building Code Council, directs the Code Council to promulgate and maintain the Uniform Code, and charges each city, town, and village in the State (with the exception of the City of New York) with the duty of administering and enforcing the Uniform Code within its municipal boundaries.					
Zoning Code	No	-	Local	Local Zoning Board of Adjustment	No
<p>Comment: Article IX, Section 2, of the State Constitution and by the various state enabling statutes. In New York, the zoning enabling acts continue to require that zoning be undertaken "in accord with a well-considered plan"11 or "in accordance with a comprehensive plan."12 Unless the town, city or village has adopted a comprehensive plan document using the more recently-enacted statutes (described later herein), local officials must refer to the extensive body of case law to determine how zoning can meet the more general "comprehensive plan" requirement.**May be impacted by State wetland regulations which protect wetlands greater than 12.4 acres and established buffer zones. Regulated at local level.</p> <p>*During the next update of the municipal zoning code, the Town will review the HMP and determine how they can incorporate the HMP into the zoning code. By doing so, it will help promote development and redevelopment patterns that are at less risk from known hazards.</p>					
Subdivision Regulations	Yes	Updated in 2018	Local	Local Review/planning board	No
<p>Comment: Subdivision is defined in the State enabling Statutes as: the division of any parcel of land into a number of lots, blocks, or sites as specified i a local ordinance, law or regulation, with or without streets or highways, for the purpose of sale, transfer of ownership, or development. There is not a requirement by NYS for subdivisions. Each municipality is permitted to further define subdivision for its own purposes in connection with its subdivision review procedure. The enabling statutes provide that a plat showing a division of land which is subject to a municipality's subdivision regulations, may not also be subject to review under its site plan review authority. (general city law s. 32 & 33, Town Law s. 276 & 277, Village Law s. 7-728 & 7-730). *During the next update of the municipal zoning code, the Town will review the HMP and determine how they can incorporate the HMP into the zoning code. By doing so, it will help promote development and redevelopment patterns that are at less risk from known hazards.</p>					
Stormwater Management Regulations	Yes	Title 6, Ch. X,17-7,8,70	Local	Code officer	Yes
<p>Comment: Codes Rules and Regulations of the State of New York, Title 6. Department of Environmental Conservation, Chapter X. Division of Water Resources, Subchapter A. General Article 3. State Pollutant Discharge Elimination System, Part 750. State Pollutant Discharge Elimination System(SPDES) Permits. New York Environmental Conservation Law, Article 17, Titles 7, 8 and Article 70. New development and redevelopment projects that result in a land disturbance of one acre or greater, including projects less than one acre if they are part of a larger common plan of development or sale or if controlling such activities in a particular watershed is require a permit by the Department</p>					
Post-Disaster Recovery Plan or Regulation	No	-	Local	-	No
Comment:					
Real Estate Disclosure	Yes	Property Condition Disclosure Act, NY	State	NYS Department of State, Real Estate Agent	Yes



	Does your municipality have this? (Yes/No)	Code Citation and Date (code chapter, name, date, link)	Authority (local, Town, state, federal)	Department / Agency Responsible	State Mandated
		Code - Article 14 §460-467			
<p>Comment: In addition to facing potential liability for failing to disclose under the exceptions to "caveat emptor," a home seller must make certain disclosures under the law or pay a credit of \$500 to the buyer at closing. While the PCDA requires a seller to complete a standardized disclosure statement and deliver it to the buyer before the buyer signs the final purchase contract, in practice, most home sellers in New York opt not to complete the statement and instead pay the credit.</p>					
Growth Management Regulation	No	-	Local	Local Planning Board	No
<p>Comment: In New York State, virtually all land use regulation, which is the primary tool for Smart Growth, takes place at the municipal level (i.e., in a city, village or town government). Land use planning is also primarily a municipal function. While State law provides for certain planning functions at the county or regional level, these mechanisms are largely advisory, whereas municipal planning is directly related to land use regulation.</p> <p>**The Town will review the HMP and identify areas of integration that they can incorporate into their real estate disclosure procedures. This can include developing disclosure requirements to have natural hazard related information and include all natural hazards that can impact the Town.</p>					
Site Plan Review	Yes	General City Law s. 27-a, Town Law s. 247a, Village Law s. 7-725a	Local	Local Planning Board	No
<p>Comment: The authority to require site plan review is derived from the State enabling Statutes (General City Law s. 27-a, Town Law s. 247a, Village Law s. 7-725a)The local legislative body has the power to delegate site plan review to the planning board, zoning board, etc. *When the Town updates the site plan review requirements, they will review the HMP and identify ways, if any, to integrate the HMP into the requirements.</p>					
Environmental Protection	Yes	Title 6 NYCRR Part 617	State	Town Review Board	Yes
<p>Comment: New State Environmental Quality Review Act (SEQR) Title 6 NYCRR Part 617 Regulations are in effect as of January 1st, 2019</p>					
Flood Damage Prevention Law	Yes	Federal :Participation in the NFIP State: Community Risk and Resiliency Act (CRRRA)	Local	Code officer	Yes - BFE+2 feet for all construction in the SFHA (residential and non-residential)
<p>Comment: A community must adopt a Flood Damage Prevention Ordinance to participate in the National Flood Insurance Program.</p> <p>* Currently being updated – not included as mitigation action due to timing and expected completion before FEMA submittal.</p>					
Municipal Separate Storm Sewer System (MS4) Regulation	Yes	EPA Phase II Stormwater Rule	State	Tompkins SWCD	Yes
<p>Comment: This requires urbanized areas (local governments) to develop a stormwater management program that will reduce the amount of pollutants carried by stormwater during storm events to waterbodies to the "maximum extent practicable". The goal of the program is to improve water quality and recreational use of waterways. A Municipal Separate Storm Sewer Systems Permit, GP-0-15-003 is required.</p>					
Emergency Management	Yes	NYS Executive Law, Article 2B.	Local	Local OEM	Yes
<p>Comment: The development of the New York State Comprehensive Emergency Management Plan (CEMP) is required under NYS Executive Law, Article 2B.</p>					
Climate Adaptation	Yes	Comprehensive Plan 2021 Update	Local	Local Planning Board	NA



	Does your municipality have this? (Yes/No)	Code Citation and Date (code chapter, name, date, link)	Authority (local, Town, state, federal)	Department / Agency Responsible	State Mandated
Comment: The environmental conservation law was amended by adding ARTICLE 75 - CLIMATE CHANGE under Assembly Bill A. 8429 and Senate Bill S. 6599, dated June 18, 2019.					
Disaster Recovery Ordinance	No	-	-	-	No
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	No
Comment:					
Other Applicable Codes, Ordinances, & Requirements	No	-	-	-	No
Comment:					
Planning Documents					
Comprehensive Plan	Yes	2020-21	Local	Planning Board	No
Comment: Optional under NYS Law, municipality may adopt a comprehensive plan or proceed through a planning process which has evolved based on case law. (Per State Legislature General City Law section 28a, Town Law s. 272a, Village Law s. 7-722) **May be impacted by State wetland regulations which protect wetlands greater than 12.4 acres and established buffer zones. Regulated at the local level. The comprehensive plan is currently being updated with close adherence to the hazard mitigation plan update. The actions and goals are meant to closely correspond between the county's initiatives as well as the municipality's initiatives around climate smart communities. *When the Town updates their comprehensive plan, they will review the HMP and identify any opportunities to integrate the HMP into the comprehensive plan. This will help promote consistency between the two plans and encourage multi-objective management and planning in the community.					
Capital Improvement Plan	No	-	-	-	No
Comment: A local government can decide to adopt its capital plan pursuant to General Municipal Law Section 99-g. The town is looking to develop a new CIP					
Disaster Debris Management Plan	No	-	-	-	No
Comment: Based on past experience with disaster management, it is apparent that local municipalities that have an Emergency Debris Management Plan in place are able to manage their emergency response in a more comprehensive and coordinated manner and are able to address recovery and clean up faster and more efficiently than those without plans. With that in mind, the Department developed an Emergency Management Plan Tool Kit. The NYSDEC (Department) strongly urges all municipal officials to conduct pre-disaster planning and prepare emergency debris management plans. The Department recommends that these plans should be reviewed and updated annually.					
Floodplain or Watershed Plan	Yes	Restoration and Protection Plan	County	Intermunicipal Org.	No
Comment: The State Pollutant Discharge Elimination System (SPDES) permit program is a primary way the DOW implements its watershed protection and restoration activities. The municipality works closely with the Cayuga Lake Watershed and is involved in the County Water Resources Council.					
Stormwater Plan	Yes	2018	Local	Watershed Committee	No
Comment: Local Authority - Could be an element of the Comprehensive Plan. There is a required planning process that must be followed when addressing stormwater management in regulated new development and redevelopment projects.					
Open Space Plan	No	-	-	-	Yes
Comment: Planning boards prepare or oversee the preparation of local comprehensive plans, which should include an open space element. The primary purpose of a local open space plan is to cause the important open lands in the community to be conserved for open space uses.					



	Does your municipality have this? (Yes/No)	Code Citation and Date (code chapter, name, date, link)	Authority (local, Town, state, federal)	Department / Agency Responsible	State Mandated
Urban Water Management Plan	No	-	-	-	No
Comment:					
Habitat Conservation Plan	No	-	-	-	No
Comment: Laws related to habit protection and biodiversity control the use and application of certain pesticides, demolition projects and clearing of vegetated areas. Identifying certain critical habitat areas could be included in the Comprehensive Plan. Critical Habitat is a part of certain State and Federal Permitting. The State had a Wildlife Action Plan requires to maintain eligibility for the State Wildlife Grant Program.					
Economic Development Plan	No	-	-	-	No
Comment: An Economic Development Plan may be prepared by a local government and be included or separate from the Comprehensive plan.**May be impacted by State wetland regulations which protect wetlands greater than 12.4 acres and established buffer zones.					
Shoreline Management Plan	No	Article 34, Environmental Conservation Law, Coastal Erosion Hazard Areas 6 NYCRR Part 505, Coastal Erosion Management Regulations	Local	-	Yes
Comment: Article 34, Environmental Conservation Law, Coastal Erosion Hazard Areas 6 NYCRR Part 505, Coastal Erosion Management Regulations					
Community Wildfire Protection Plan	No	-	Local	-	No
Comment: Under the federal Farm Bill, every 10 years each state must submit a State Forest Action Plan to the U.S. Forest Service. The Plan must be approved by the State Forester, who in New York is the director of DEC's Division of Lands and Forests. The next update of the Plan must be submitted to the Forest Service by June 2020.					
Forest Management Plan	No	-	Local	-	No
Comment:					
Transportation Plan	No	-	Local	-	No
Comment:					
Agriculture Plan	Yes	NYCRR Part 390 Agricultural and Farmland Protection -	County	County Planning	Yes
Comment: Municipalities may develop agricultural and farmland protection plans, in cooperation with cooperative extension and other organizations, including local farmers.					
Other (tourism, business dev, etc.)	-	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan	Yes	2003 NYS Executive Law, Article 2B	Local	Local OEM	Yes
Comment: The development of the New York State Comprehensive Emergency Management Plan (CEMP) is required under NYS Executive Law, Article 2B. The plan is developed and maintained by the New York State Office of Emergency Management and agencies that comprise the NYS Disaster Preparedness Commission (DPC). *When the Town updates their CEMP, they will review the HMP					



	Does your municipality have this? (Yes/No)	Code Citation and Date (code chapter, name, date, link)	Authority (local, Town, state, federal)	Department / Agency Responsible	State Mandated
and identify any areas that can be integrated. This can include an analysis of the potential hazards to the Town and update goals and objectives to align with the HMP, as necessary.					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	State Level only	State	State OEM	Yes
Comment: HIRA is an annual requirement that all states must complete to remain eligible to receive federal homeland security grant funding. It also involves a hazard and capability assessment but DHSES has several methodological concerns with the THIRA process and has developed CEPA to serve as the State's system to capture and analyze hazard/capability information. However, CEPA has been engineered to support the completion of the THIRA.					
Post-Disaster Recovery Plan	No	-	-	-	No
Comment:					
Continuity of Operations Plan	No	-	-	-	No
Comment: According to the FEMA, "State and local governments should consider developing or updating contingency plans for the continuity of operations (COOP) of vital government functions. Jurisdictions must be prepared to continue their minimum essential functions throughout the spectrum of possible threats from natural disasters through acts of terrorism. COOP planning facilitates the performance of State and local government and services during an emergency that may disrupt normal operations."					
Public Health Plan	No	-	Local	-	No
Comment:					
Other: Emergency Response Plan	No	-	-	-	No
Comment: Nothing is mandated by law in NYS, however, article 2B of the Executive Law provides for authority to draft emergency plans by various levels of government in NYS.					

Table 9.2-4. Development and Permitting Capability

Indicate if your jurisdiction implements the following	Response Yes/No; Provide further detail
Development Permits. If yes, what department?	No
Permits are tracked by hazard area. For example, floodplain development permits.	No
Buildable land inventory If yes, please describe If no, please quantitatively describe the level of buildout in the jurisdiction.	No

9.2.4.2 Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Town of Caroline.



Table 9.2-5. Administrative and Technical Capabilities

Resources	Available? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning
Mitigation Planning Committee	No	-
Environmental Board/Commission	Yes	Energy Independent Caroline
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	No	-
Maintenance programs to reduce risk	No	-
Mutual aid agreements	No	-
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	TG Miller Engineers
Engineers or professionals trained in building or infrastructure construction practices	Yes	Code officer
Planners or engineers with an understanding of natural hazards	Yes	TG Miller Engineers
Staff with expertise or training in benefit/cost analysis	No	
Professionals trained in conducting damage assessments	Yes	TG Miller Engineers
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	No	-
Scientist familiar with natural hazards	No	-
NFIP Floodplain Administrator (FPA)	Yes	Code officer
Surveyor(s)	No	-
Emergency Manager	No	-
Grant writer(s)	No	-
Resilience Officer	No	-
Other	Yes	Stormwater Infrastructure – Highway Superintendent



9.2.4.3 Fiscal Capability

The table below summarizes financial resources available to the Town of Caroline.

Table 9.2-6. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	No
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state Funding Programs	No
Open Space Acquisition funding programs	No
Other	No

9.2.4.4 Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Town of Caroline.

Table 9.2-7. Education and Outreach Capabilities

Indicate if your jurisdiction has the following resources	Yes/No; Please describe
Public information officer or communications office?	No
Personnel skilled or trained in website development?	Yes – Webmaster
Hazard mitigation information available on your website; if yes, describe	No
Social media for hazard mitigation education and outreach; if yes, briefly describe.	No
Citizen boards or commissions that address issues related to hazard mitigation; if yes, briefly describe.	Yes -Watershed Committee
Other programs already in place that could be used to communicate hazard-related information; if yes, briefly describe.	Yes – email listserv
Warning systems for hazard events; if yes, briefly describe.	No
Natural disaster/safety programs in place for schools; if yes, briefly describe.	No
Other	No

9.2.4.5 Community Classifications

The table below summarizes classifications for community programs available to the Town of Caroline.



Table 9.2-8. Community Classifications

Program	Participating? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	No	-	-
NYSDEC Climate Smart Community	Yes	Bronze Community	2019
Storm Ready Certification	No	-	-
Firewise Communities classification	No	-	-
Other	No	-	-

Note:

N/A Not applicable
NP Not participating
- Unavailable

9.2.4.6 Adaptive Capacity

Adaptive capacity is defined as “the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences” (IPCC 2014). In other words, it describes a jurisdiction’s current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction’s rating.

Table 9.2-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low*
Disease Outbreak	Medium
Drought	Medium
Extreme Temperature	Medium
Flood	Medium
Harmful Algal Bloom	Medium
Invasive Species	Medium
Severe Storm	Medium
Severe Winter Storm	High
Wildfire	Medium

*High Capacity exists and is in use
Medium Capacity may exist; but is not used or could use some improvement
Low Capacity does not exist or could use substantial improvement
Unsure Not enough information is known to assign a rating

9.2.4.7 National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.



NFIP Floodplain Administrator (FPA)

Cory Williams, CEO

Table 9.2-10. Floodplain Administrator Questionnaire

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction. <ul style="list-style-type: none"> Do you maintain a list of properties that have been damaged by flooding? 	No
Do you maintain a list of property owners interested in flood mitigation? <ul style="list-style-type: none"> How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)? 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what projects are underway. 	No
How do you make Substantial Damage determinations? <ul style="list-style-type: none"> How many were declared for recent flood events in your jurisdiction? 	Code Enforcement officer/ Building Inspector determines damage
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? <ul style="list-style-type: none"> If there are mitigation properties, how were the projects funded? 	None
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If not, state why. 	No, the maps are outdated and are from the 1980s
Resources	
What local department is responsible for floodplain management?	Building/ Code enforcement
Are any certified floodplain managers on staff in your jurisdiction?	No
Do you have access to resources to determine possible future flooding conditions from climate change?	No
Does your floodplain management staff need any assistance or training to support its floodplain management program? <ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	Yes – general training and technical assistance
Provide an explanation of NFIP administration services you provide (e.g. permit review, GIS, education/outreach, inspections, engineering capability)	Yes permit review
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	It depends - subjective based on property type
What are the barriers to running an effective NFIP program in the community, if any?	Funding



NFIP Topic	Comments
Compliance History	
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state the violations. 	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	June 19, 2019
Regulatory	
What is the local law number or municipal code of your flood damage prevention ordinance? <ul style="list-style-type: none"> What is the date that your flood damage prevention ordinance was last amended? 	Local Law #2 of 2011
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meets
Are there other local ordinances, plans or programs (e.g. site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	Through site Plan review
Community Rating System (CRS)	
Does your jurisdiction participate in CRS? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	No

9.2.4.8 National Flood Insurance Program (NFIP) Summary

The following table summarizes the NFIP statistics for the Town of Caroline.

Table 9.2-11. NFIP Summary

Municipality	# Policies	# Claims (Losses)	Total Loss Payments	# RL Properties	# SRL Properties
Town of Caroline	12	17	\$41,923.91	0	NA

Source: FEMA 2020

Notes: Policies, claims, repetitive loss, and severe repetitive loss statistics provided by FEMA Region 2, and current as of February 28, 2018. The total number of repetitive loss properties does not include severe repetitive loss properties

RL Repetitive Loss; SRL Severe Repetitive Loss

9.2.4.9 Additional Areas of Existing Integration

Emergency services, including firefighting and first responder services are provided by three local volunteer fire companies. As residents increasingly work outside the town, it is more difficult to recruit volunteers, even as the demand for services is increased. Significant and focused effort is required to



keep these essential volunteer services sufficiently staffed, trained, and funded to provide the community the emergency response that is needed. Fundraising activities of these companies, through pancake breakfasts and chicken barbeques, provide important social occasions and community gatherings for local residents. Increasing support and pride in these services will increase quality of life for all residents.

Climate change is a concern for many Caroline residents. There are many expected negative consequences arising from climate change, including the impact of changing rainfall patterns on local agriculture, the impact of more high-heat days on the health of humans and other animals, the impact of more frequent and more intense weather events and more frequent flooding events on Town infrastructure and the impact of changes in season timing on pollinating insects and migrating wildlife. Town actions in response to concerns over climate change include improving the energy efficiency of town buildings, replacing existing street lights with more efficient LED bulbs, installing electric vehicle charging stations, and conducting a greenhouse gas emissions inventory. In recognition of these and other actions, Caroline has been awarded a bronze level certification in New York State's Climate Smart Communities program. The town is currently conducting a climate vulnerability study to identify areas and populations in the town that are particularly likely to be adversely impacted by climate change and possible strategies for reducing those impacts.

Natural resources are important in many ways to the vibrancy of Caroline. They provide recreational activities such as bird watching, hiking, fishing, and simply enjoying the beauty of the Town. Natural resources also improve the local economy by supporting agriculture and tourism, improve the resiliency of town infrastructure against damage from severe storms, and improve human health by cleaning the air and water and lowering stress levels. In 2019 the Town of Caroline conducted a Natural Resources Inventory (available at <http://www.townofcaroline.org/uploads/6/2/7/8/62781479/caroline-nri.pdf>).

9.2.4.10 Evacuation, Sheltering, Temporary Housing, and Permanent Housing

Evacuation routes, sheltering measures, temporary housing, and permanent housing must all be in place and available for public awareness to protect residents, mitigate risk, and relocate residents, if necessary, to maintain post-disaster social and economic stability.

Evacuation Routes

The Town considers Route 79, a State route the primary road for evacuation. However, evacuation routes are specific to hazard event and routes will vary according to the location of the event. The Town will identify evacuation routes according to procedures outlined in the ESF16 annex of the Tompkins County 2021 CEMP.



Sheltering

The Town has the following known emergency shelters. In the event that sheltering is needed, shelters will be determined at the time of an emergency, in accordance with the County CEMP.

Table 9.2-12. Shelter Locations in the Municipality

Shelter Name	Address	Capacity	Accommodates Pets?	ADA Compliant?	Backup Power?	Types of Medical Services Provided	Other Services Provided
Brooktondale Community Center	Brooktondale NY	100	Yes	Yes	No	None	NA
Slaterville Fire Hall	Slaterville NY	100	No	No	Yes	None	NA
Town Hall	Slaterville NY	50	No	Yes	No	None	NA

Temporary Housing

The Town does not have any available land for temporary housing, as it is not necessarily needed due to the Town’s rural characteristics. Therefore, the Town has not identified sites for the placement of temporary housing for residents displaced by a disaster or potential sites suitable for relocating structures out of the floodplain and/or building new homes once properties in the floodplain are acquired. In the event temporary housing is needed, the Town will work with the County to find suitable locations using the locations identified in Section 4 (County Profile) Table 4-9 as a starting point.

Table 9.2-13. Temporary Housing Locations in the Municipality

Site Name	Site Address	Infrastructure / Utilities Available (water, electric, septic, etc.)	Capacity (number of sites)	Type	Actions Required to Ensure Conformance with the NYS Uniform Fire Prevention and Building Code
Please refer to the locations identified in Section 4 (County Profile) Table 4-9 as a starting point to identify potential temporary housing locations in neighboring communities.					



Permanent Housing

The Town does not have any available land for permanent housing. While the Town did not identify potential locations for permanent housing, as part of the planning process, a countywide buildable land analysis was conducted and presented in Section 4 (County Profile). The Town can utilize this analysis to identify potential locations.

Table 9.2-14. Permanent Housing Locations in the Municipality

Site Name	Site Address	Infrastructure / Utilities Available (water, electric, septic, etc.)	Capacity (number of sites)	Type	Actions Required to Ensure Conformance with the NYS Uniform Fire Prevention and Building Code
Please refer to the County-wide buildable land inventory in Volume 1, Section 4 (County Profile) of this plan.					

9.2.5 Hazard Event History Specific to the Town of Caroline

Town of Caroline has a history of natural hazard events as detailed in Volume I, Section 5 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the Town and its municipalities. The Town of Caroline's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Town of Caroline. Table 9.2-15 provides details regarding municipal-specific loss and damages the Town experienced during hazard events. Information provided in the table below is based on reference material or local sources. For details of these and additional events, refer to Volume I, Section 5.0 of this plan.

Table 9.2-15. Hazard Event History

Dates of Event	Event Type (Disaster Declaration if applicable)	County Designated?	Summary of Event	Municipal Summary of Damages and Losses
August 3, 2014	Heavy Rain and Flash Flooding	No	Showers and thunderstorms in the area produced torrential downpours. In the County, several roadways were inundated causing approximately \$100,000 in property damage.	While this event impacted the community, due to lack of resources damage history has not been documented.
June 14-15, 2015	Heavy Rain and Flash Flood	No	A tropical-like airmass was in place allowing for a stripe of 2-4 inches of very heavy rain to fall in a narrow band extending from near Watkins Glen to	While this event impacted the community, due to lack of resources damage



Dates of Event	Event Type (Disaster Declaration if applicable)	County Designated?	Summary of Event	Municipal Summary of Damages and Losses
			areas north of Binghamton. Severe flash flooding was encountered with numerous roads and culverts destroyed by raging water. In some areas, homes, schools and other businesses were flooded. In Tompkins County, flooding caused the washout of numerous bridges in the area. The County had approximately \$1.5 million in damages from this event.	history has not been documented.
March 14-15, 2017	Severe Winter Storm and Snowstorm (DR-4322)	Yes	Snowfall ranged between 12 and 24 inches in Tompkins County with the highest amounts in the far southeast part of the county.	While this event impacted the community, due to lack of resources damage history has not been documented.
July 24, 2017	Heavy Rain and Flash Flooding	No	Widespread thunderstorms produced three to inches of rain. This led to streams and creeks overflowing their banks and flash flooding in many areas. The County had approximately \$75,000 in property damage.	While this event impacted the community, due to lack of resources damage history has not been documented.
October 31-November 1, 2019	Severe Storms, Straight-Line Winds and Flooding (DR-4472)	Yes		No notable damage from this flood, though surrounding regions did get affected.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.2.6 Hazard Ranking and Jurisdiction-Specific Vulnerabilities

The hazard profiles in Section 5.0 (Risk Assessment) of this plan have detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the Town of Caroline’s risk assessment results and data used to determine the hazard ranking.

9.2.6.1 Critical Facilities

New York Department of Environmental Conservation (DEC) Statute 6 CRR-NY 502.4 sets forth floodplain management criteria for State projects located in flood hazard areas. The law states that no such projects related to critical facilities shall be undertaken in a Special Flood Hazard Area (SFHA)



unless constructed according to specific mitigation specifications, including being raised 2' above the Base Flood Elevation (BFE). This statute is outlined at <http://tinyurl.com/6-CRR-NY-502-4>. While all vulnerabilities should be assessed and documented, the State places a high priority on exposure to flooding. Critical facilities located in an SFHA, or having ever sustained previous flooding, must be protected to the 0.2-percent or 500-year flood event, or worst damage scenario. For those that do not meet this criteria, the jurisdiction must identify an action to achieve this level of protection (NYS DHSES 2017).

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain and presents Hazards United States (HAZUS) – Multi-Hazards (MH) estimates of the damage and loss of use to critical facilities as a result of a 1-percent annual chance flood event.

Table 9.2-16. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Addressed by Proposed Action
		1% Event	0.2% Event	
Town DPW	Government	Yes	Yes	2021-T CAROLINE-009

Source: Tompkins County

9.2.6.2 Hazard Ranking

This section provides the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment) of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy as well as community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 5.3 (Hazard Ranking), each participating jurisdiction may have differing degrees of risk exposure and vulnerability compared to Tompkins County as a whole. Therefore, each municipality ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for the Town of Caroline. The Town of Caroline has reviewed the County hazard risk/vulnerability risk ranking table as well as its individual results to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard/vulnerability risk ranking, the Town of Caroline indicated the following:

- The Town is overall less vulnerable to disease outbreak due to its relatively rural characteristics.
- While the Town has a large percentage of agricultural land, much of it is unused and thus the Town is not as vulnerable as originally calculated.
- The Town does not have major issue around wildfires due to the damp and cool climate of the area.



- The Town is actively increasing its resilience to flooding by replacing and repairing existing stormwater infrastructure.

Table 9.2-17. Hazard Ranking Input

Hazard	Ranking
Disease Outbreak	Low*
Drought	Medium*
Extreme Temperature	Medium
Flood	High
Harmful Algal Bloom	Low
Invasive Species	Medium
Severe Storm	High
Severe Winter Storm	Medium
Wildfire	Low*

Note: The scale is based on the following hazard rankings as established in Section 5.3.
 *The Town of Caroline changed the initial ranking of this hazard based on event history, municipal experience, and feedback from the Town of Caroline

9.2.6.3 Identified Issues

The Town of Caroline has identified the following vulnerabilities within their community:

- Stormwater Management and cascading effects on residential properties.
- Water supply of water is primarily through private wells and some residents could experience water supply shortage or degraded quality.
- Given the rural characteristics of the municipality, some members do not have air conditioning and are vulnerable to extreme heat.
- Parts of the municipality does not have cell service and are vulnerable to potential disconnection during severe storm.

Specific areas of concern based on resident response to the Town of Caroline Hazard Mitigation Citizen survey include:

- The Town of Caroline is primarily concerned with flooding and erosion.
- Extreme temperatures are becoming more of a concern and heat shelters would be good to have in the near future.
- The Town does not have a municipal water system, so some residents are vulnerable to water supply shortage and degraded water.



9.2.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and their prioritization.

9.2.7.1 Past Mitigation Initiative Status

The following table indicates progress on the community’s mitigation strategy identified in the 2014 Plan. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under ‘Capability Assessment’ presented previously in this annex.



Table 9.2-18. Status of Previous Mitigation Actions

Project #	Project Name	Hazard(s) Addressed	Responsible Party	Brief Summary of the Original Problem and the Solution (Project)	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if complete)		Next Steps 1. Project to be included in 2021 HMP or Discontinue 2. If including action in the 2021 HMP, revise/reword to be more specific (as appropriate). 3. If discontinue, explain why.
						Cost	-	
C1		Flood	Town of Caroline Watershed Committee	Continue local stream bank stabilization projects	Ongoing	Cost	-	Discontinued, ongoing effort
						Level of Protection	-	
						Damages Avoided; Evidence of Success	-	
C2		Flash Flood	Town of Caroline Watershed Committee	Formalize protections and green infrastructure practices along stream banks to encourage riparian vegetation for channel and floodplain stabilization and wildlife habitat	Ongoing	Cost	-	Discontinued; ongoing effort
						Level of Protection	-	
						Damages Avoided; Evidence of Success	-	



9.2.7.2 Completed Mitigation Initiatives Not Identified in the Previous Mitigation Strategy

The Town of Caroline has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2014 Plan:

- Currently in the process of updating the comprehensive plan to incorporate climate change.
- Have been actively upgrading the existing stormwater infrastructure throughout the town.
- The Town is actively involved in other climate change related programs such as Climate Smart Communities in which it is actively pursuing its residents to increase their resilience by practicing smart land use measures and increasing dependence on renewable energy.
- The Town conducted its own climate vulnerability assessment in 2020.

9.2.7.3 Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Caroline participated in a mitigation action workshop in 2020 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 'Selecting Appropriate Mitigation Measures for Floodprone Structures' (March 2007) and FEMA 'Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards' (January 2013).

Table 9.2-19 summarizes the comprehensive range of specific mitigation initiatives the Town of Caroline would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as 'High', 'Medium', or 'Low.' The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.2-20 provides a summary of the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.2-19. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
2021-T CAROLINE-001	Ground Water Study	1,3	Flood/Drought	<p>Problem: The Town has previously experience water loss due to construction along Buffalo Road and damaging an aquifer.</p> <p>Solution: Conduct a separate study to better understand the cause of the ground failure related water depletion issue. Once completed, provide vulnerable and affected residents with potential solutions to have adequate access to water supply.</p>	No	No	6 months	Town Board and DPW	Medium	High	FEMA HMGP, Clean Water Act Section 604(b) Water Quality Planning Grants Water Quality Improvement Project (WQIP) Program	Medium	LP R	NR
2021-T CAROLINE-002	Adopt Zoning Ordinance	All Goals	All Hazards	<p>Problem: The Town of Caroline does not have a zoning ordinance</p> <p>Solution: The establishment of a zoning ordinance will ensure that future developments are up-to-standard and have minimal risks during hazard events and will allow for regulations that development permits are not given in hazard areas or in the floodplain.</p>	No	No	1 year	Town Board	Low	High	Municipal Budget	High	LP R	PR
2021-T CAROLINE-003	Flood Mitigation Along White Church Road	1,3,5		<p>Problem: The hamlet of Brooktondale along White Church road continues to experience extreme stream overflow and flooding due to the merging and</p>	No	No	1 year	Town/SWCD	High	High	HMGP, BRIC, Community Facilities	Medium	SIP	SP



Table 9.2-19. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
			Flood, Severe Storms	<p>intersection of multiple major ditches and streams.</p> <p>Solution: Initiate an engineering feasibility study to determine best alternative to mitigation streambank erosion, including alternatives such as reinforcement of existing streambank or installation of permeable riparian buffers that can mitigate flooding/ stream overflow.</p>							Direct Loan & Grant Program			
2021-T CAROLINE-004	Canaan Road Outreach	1,3,5	Flood, Severe Storm	<p>Problem: Properties along Canaan Road experience ground water flooding on private property</p> <p>Solution: Conduct outreach to community/ property owners located along Canaan Road and assess the property owners' current needs and damaged experienced due to ground water flooding. Once priority properties have been determined, consider relocation and or structural reinforcements to divert ground water from property.</p>	No	No	1 year	Town Conservation Board	Low	High	Municipal Budget, FMA	High	EAP	PI
2021-T CAROLINE-005	Living Snow Fence	1,3,5	Severe Snow Storms	<p>Problem: Major routes that through the town, specifically State Route 79 is especially prone to snow drifts due to the flat and lack of vegetative surrounding geographical characteristics.</p> <p>Solution: Install permanent vegetative barriers to decrease the wind strength and protect roads from potential snow drifts and whiteouts.</p>	No	No	Medium	Town DPW	Medium	High	Town Budget; BRIC	High	SIP	SP



Table 9.2-19. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
2021-T CAROLINE-006	Backup Water Supply Development	1,3,5	Severe Storm, Drought	Problem: The town of Caroline does not have municipal water and thus is vulnerable to unreliable water supply based on geography.	No	No	Medium	Town Planning	Low	High	Town Budget, FEMA HMGP, WQIP, Assistance to Firefighters Grant Program	Medium	SIP	SP
				Solution: Designate emergency water supply hub that can be used in case of water contamination and or reduced well capacity.										
2021-T CAROLINE-007	Power Utility Assessment	All Goals	All Hazards	Problem: The Town of Caroline experiences frequent power outages due to utility line failure, especially those located in rural areas of the town	No	No	1 year	Town/NYSEG	Medium	Medium	Town Budget, FEMA HMGP, NYSERDA CEC, CSC Grant Program	High	LPR	PR
				Solution: The town of Caroline should conduct assessment of specific properties that are prone to power outages and the power lines that are located within the region. If no definite solution is determined based on assessment, conduct outreach to community members to discuss potential backup power installation that can be used during extreme weather event.										
2021-T CAROLINE-008	Repetitive Loss Property Outreach	1,2,3	Flood, Severe Storm	Problem: There are 4 NFIP repetitive loss properties in the community. Solution: Conduct outreach to flood-prone property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner	No	No	1 year	Town Board	Low	Medium	Town Budget	Medium	EAP	PR



Table 9.2-19. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
				information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the areas that experience frequent flooding.										
2021-T CAROLINE-009	Town DPW Flood Mitigation	1	Flood	<p>Problem: The Town DPW is located in a 1 % chance flood zone.</p> <p>Solution: Conduct assessment of existing facility and consider retrofitting/ elevating existing structures that are prone to flooding. Alternatively consider applying for FEMA funding for acquisition and relocation/ reconstruction of facility in a non-flood zone.</p>	Yes	No	1 year	Town DPW	High	High	Town DPW Budget, HMA, FMA, HMGP, BRIC	High	SIP	SP
2021-T CAROLINE-010	South Road Culvert Upgrading	1,3,5	Flood, Severe Storm	<p>Problem: The existing 60" steel culvert crosses below South Road on a skew and is approximately 60.5' long. The culvert was installed 25 ago. An inlet headwall is made up of modular concrete blocks that have settled and become unstable. See photo log and site plan attached. The outlet end of the culvert has eroded the stream bed such that the culvert invert is approximately 8' above the creek bottom. The outlet end of the culvert has also been undermined, jeopardizing the stability of the road. Approximately at mid span within the culvert, directly under the road, the culvert</p>	No	No	2 years	Town DPW	High	High	Municipal DPW Budget, BRIC, Climate Smart Communities Program	High	SIP	SP



Table 9.2-19. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
				<p>has become deformed and is starting to fail. A hole in the culvert has formed such that aggregate has been exposed.</p> <p>Solution: Based on these assumptions stated above the 60" culvert appears to be undersized when considering additional flows from the south. Until further investigation can be performed, culvert may be exceeded for events greater than the 50-year, 24- hour storm. Based on the information obtained and the existing conditions observed we recommend the culvert be upsized and possibly realigned to address entry and exit conditions. There is significant grade change between the inlet and outlet end of the culvert that would also need to be addressed during replacement. From the road to creek invert at the outlet end there is approximately 21' change in elevation which makes maintaining the culvert difficult by Town Highway staff. To mitigate the 8' fall at the outlet end, a grade control structure, such as a concrete retaining wall or stepped extra-heavy stone wall will be required.</p>										

Notes:
Not all acronyms and abbreviations defined below are included in the table.



Acronyms and Abbreviations:

CAV	Community Assistance Visit
CRS	Community Rating System
DPW	Department of Public Works
EHP	Environmental Planning and Historic Preservation
FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA	Flood Mitigation Assistance Grant Program
HMGP	Hazard Mitigation Grant Program
PDM	Pre-Disaster Mitigation Grant Program
BRIC	Building Resilient Infrastructure and Communities Program

Timeline:

The time required for completion of the project upon implementation


Cost:

The estimated cost for implementation.

Benefits:

A description of the estimated benefits, either quantitative and/or qualitative.

Critical Facility:

Yes  Critical Facility located in 1% floodplain

Mitigation Category:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- Natural Resource Protection (NR) - Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities



Table 9.2-20. Summary of Prioritization of Actions

Project Number	Project Name	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-T CAROLINE-001	Ground Water Study	1	1	1	1	0	0	-1	0	0	0	0	1	1	1	6	Medium
2021-T CAROLINE-002	Adopt Zoning Ordinance	1	1	1	1	1	0	1	1	1	1	1	1	1	1	13	High
2021-T CAROLINE-003	Flood Mitigation Along White Church Road	1	1	1	1	0	0	-1	1	0	0	0	0	1	1	6	Medium
2021-T CAROLINE-004	Canaan Road Outreach	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-T CAROLINE-005	Living Snow Fence	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	12	High
2021-T CAROLINE-006	Backup Water Supply Development	1	1	1	1	0	0	0	0	0	0	1	1	1	1	8	Medium
2021-T CAROLINE-007	Power Utility Assessment	1	1	1	1	1	-1	0	1	1	1	1	1	1	1	11	High
2021-T CAROLINE-008	Repetitive Loss Property Outreach	1	1	1	0	1	0	0	0	1	0	1	0	1	1	8	Medium
2021-T CAROLINE-009	Town DPW Flood Mitigation	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	12	High
2021-T CAROLINE-010	South Road Culvert Upgrading	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	12	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



9.2.8 Proposed Mitigation Action Types

The table below indicates the range of proposed mitigation action categories.

Table 9.2-21. Analysis of Mitigation Actions by Hazard and Category

Hazard	FEMA				CRS					
	LPR	SIP	NSP	EAP	PR	PP	PI	NR	SP	ES
Drought	001; 002; 007	006			002; 007			001	006	
Extreme Temperature	002; 007				002; 007					
Flood	001; 002; 007	003; 009; 010		004; 008	002; 007; 008		004	001	003; 009; 010	
Harmful Algal Bloom	002; 007				002; 007					
Invasive Species	002; 007				002; 007					
Severe Storm	002; 007	003; 006; 010		004; 008	002; 007; 008		004		003; 006; 010	
Severe Winter Storm	002; 005; 007				002; 007				005	
Wildfire	002; 007				002; 007					

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.2.9 Staff and Local Stakeholder Involvement in Annex Development

The Town of Caroline followed the planning process described in Section 3 (Planning Process) in Volume I of this plan update. This annex was developed over the course of several months with input from many Town departments, including: Town Highway, Town Code Enforcement, Supervisor, and Town Clerk. The Supervisor, Mark Witmer represented the community on the Town of Caroline Hazard Mitigation Plan Planning Partnership and supported the local planning process requirements by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Additional documentation on the Town of Caroline’s planning process through Planning Partnership meetings is included in Section 3 (Planning Process).

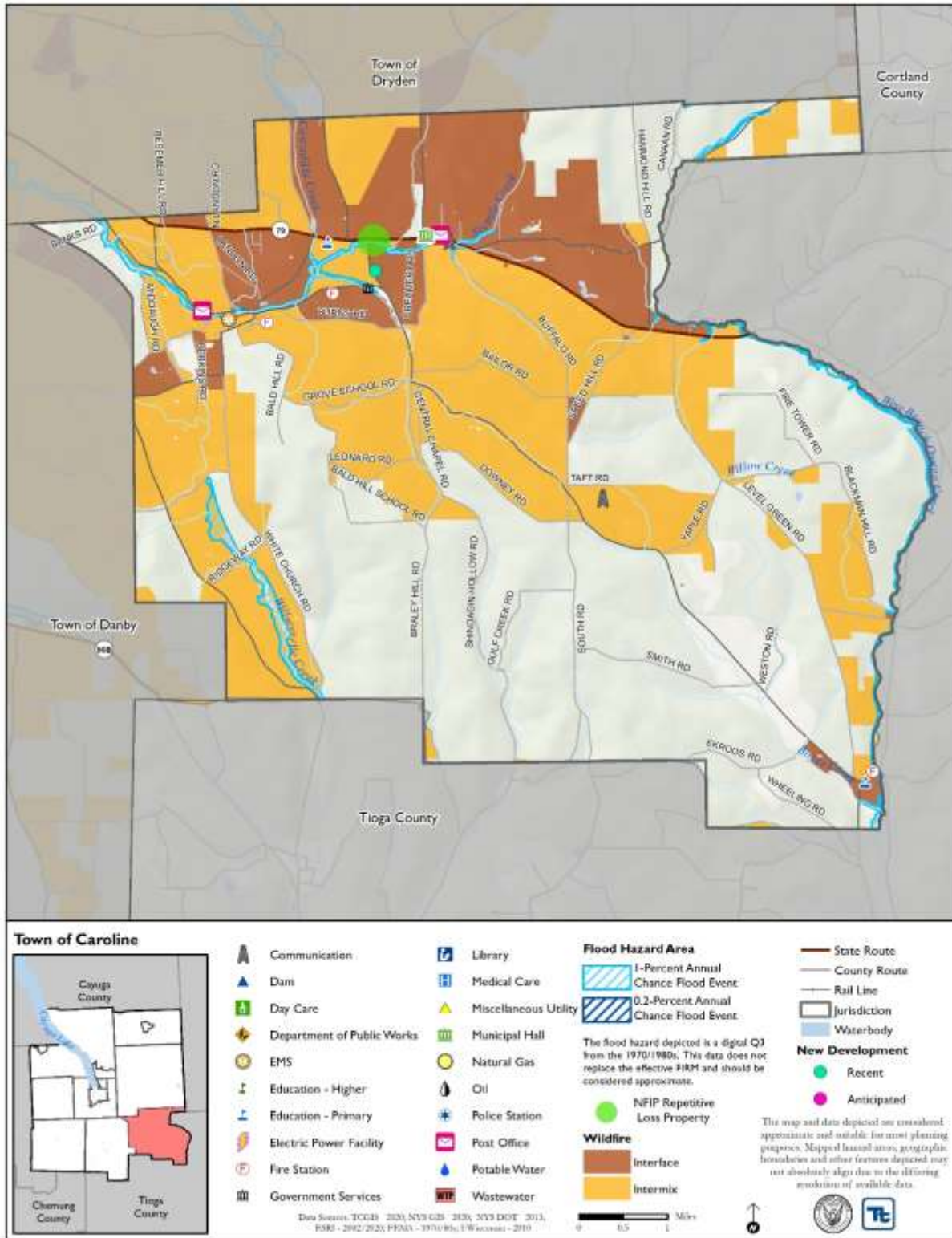


9.2.10 Hazard Area Extent and Location

A hazard area extent and location map has been generated for the Town of Caroline that illustrates the probable areas impacted within the Town of Caroline. This map is based on the best available data at the time of the preparation of this plan, and is considered to be adequate for planning purposes. The map has only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the Town of Caroline has significant exposure. The map is illustrated below.



Figure 9.2-1. Town of Caroline Hazard Area Extent and Location Map



Action Worksheet			
Project Name:	Highway Facilities Modernization		
Project Number:	2021-T CAROLINE-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood Severe Storm		
Description of the Problem:	The Highway Garage is 50 years old and in need of repair. Additionally, a portion of the property near a creek is in 500-year flood plain and the facility needs backup power upgrades. While the facility does have a backup generator, it is old and below capacity.		
Action or Project Intended for Implementation			
Description of the Solution:	Currently, the Town does not have a specific solution to the highway facility modernization process. Thus the Town proposes to develop a replacement plan that best utilizes current property and assets, mitigates flood vulnerability, and qualifies for grant funds. This will also need to consider projected climate change, population trends and service demand, and new technology that can optimize DPW operations. Phase 2 of the project would be to execute the plan.		
Is this project related to a Critical Facility?		Yes <input checked="" type="checkbox"/>	No
Is the critical facility located in the 1% annual chance flood area?		Yes <input checked="" type="checkbox"/>	No
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	High	Estimated Benefits (losses avoided):	Maintenance costs reduced, enhanced care and management of highway EQ.
Useful Life:	50 years	Goals Met:	Enhanced maintenance and safety
Estimated Cost:	1.5M – Total cost incl project itself.	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	Town DPW Budget, FMA, HMGP, BRIC
Responsible Organization:	Caroline Town Board	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation Plan
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Relocate	2.5M	Same benefits, but more expensive



	Highway Facility Modernization	1.5 M	Most economically feasible option with similar benefits as relocation.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Highway Facilities Modernization	
Project Number:	2021-T CAROLINE-009	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	The project protects property
Property Protection	1	The project protects property
Cost-Effectiveness	1	The project is cost effective
Technical	1	The project is technically feasible
Political	1	There is no political issues with the project
Legal	1	There are no legal complications for this project
Fiscal	-1	The town is not able to fund the project without any external assistance.
Environmental	1	The project has a positive impact on the environment
Social	1	The project will have a positive social impact on the community
Administrative	1	The administration is fully supportive of the project
Multi-Hazard	1	The project covers multiple hazards of concern
Timeline	1	The timeline is reasonable given the project
Agency Champion	1	Yes
Other Community Objectives	1	Yes
Total	12	
Priority	High	



Action Worksheet			
Project Name:	South Road Culvert Upgrading		
Project Number:	2021-T CAROLINE-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	<p>The existing 60" steel culvert crosses below South Road on a skew and is approximately 60.5' long. The culvert was installed 25 ago. An inlet headwall is made up of modular concrete blocks that have settled and become unstable. See photo log and site plan attached. The outlet end of the culvert has eroded the stream bed such that the culvert invert is approximately 8' above the creek bottom. The outlet end of the culvert has also been undermined, jeopardizing the stability of the road. Approximately at mid span within the culvert, directly under the road, the culvert has become deformed and is starting to fail. A hole in the culvert has formed such that aggregate has been exposed.</p> <p>South Road is a well-traveled road used by local commuters and truck traffic traveling to surrounding Town and Cities as well as truck traffic. Camp MacCormick Secure Center, operated by the Office of Children and Family Services is located approximately 0.2 miles north of the site on South Road. Camp MacCormick is considered a critical facility and it is important to maintain emergency access. If the South Road culvert fails the detour would be approximately 11.1 miles. See detour map attached.</p> <p>The existing conditions observed are vulnerable to structural and hydraulic failure. The inlet headwall is unstable and could collapse, obstructing the culvert inlet directing flow south to the 15" culvert and eventually overtopping the roadway. Due to the significant grade change on the west side of the road (20'-30' at approximately 2:1 slope) flows that overtop the road will cause significant erosion of the embankment and potentially lead to road failure. The road shoulder near the outlet end has already become unstable and is susceptible to road failure as evidenced the photos attached.</p>		
Action or Project Intended for Implementation			
Description of the Solution:	<p>Based on these assumptions stated above the 60" culvert appears to be undersized when considering additional flows from the south. Until further investigation can be performed, culvert may be exceeded for events greater than the 50-year, 24- hour storm. Based on the information obtained and the existing conditions observed we recommend the culvert be upsized and possibly realigned to address entry and exit conditions. There is significant grade change between the inlet and outlet end of the culvert that would also need to be addressed during replacement. From the road to creek invert at the outlet end there is approximately 21' change in elevation which makes maintaining the culvert difficult by Town Highway staff. To mitigate the 8' fall at the outlet end, a grade control structure, such as a concrete retaining wall or stepped extra-heavy stone wall will be required.</p>		
Is this project related to a Critical Facility?		Yes	No <input checked="" type="checkbox"/>
Is the critical facility located in the 1% annual chance flood area?		Yes	No <input checked="" type="checkbox"/>
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	High	Estimated Benefits (losses avoided):	Reduce erosion and sediment backup along candor road.



Useful Life:	50 years	Goals Met:	1,3,5
Estimated Cost:	High	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	high	Desired Timeframe for Implementation:	Within 6 months once funding secured
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	Municipal DPW Budget, BRIC, Climate Smart Communities Program
Responsible Organization:	Caroline Town Board	Local Planning Mechanisms to be Used in Implementation if any:	NA
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0 and potential property damage	Current problem continues
	Road Elevation and Retrofitting	High	Problem is prevented along road, but stream and ditch will continue to erode.
	South Road Culvert Upgrading	High	Road will stop flooding and erosion will be prevented
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	South Road Culvert Upgrading	
Project Number:	2021-T CAROLINE-010	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	The project protects property
Property Protection	1	The project protects property
Cost-Effectiveness	1	The project is cost effective
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Agency Champion	1	Yes
Other Community Objectives	1	Yes
Total	12	
Priority	High	

