

LONG TERM COMMUNITY RECOVERY STRATEGY

Town of Tioga, New York

Date: September, 2013



Sponsored by the NYS
Department of State,
Office of Communities
and Waterfronts



This document is intended to be printed double-sided on letter size paper.



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Project Overview



The State of New York Department of State (DOS) has provided funding to the Town of Tioga to create the Long Term Community Recovery Strategy (LTCRS). The Town is working in conjunction with the Tioga County Department of Economic Development and Planning and the Department of State to complete this study.

Regional Setting

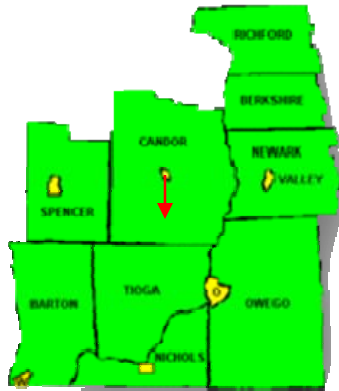
The Town of Tioga is located along the southern border of Tioga County, in the Southern Tier region of New York State. The County, which measures 523 square miles, is located approximately 30 miles west of the City of Binghamton and is within a three- to four-hour drive to major metropolitan centers such as Philadelphia, New York, and Buffalo.

Tioga County is comprised of nine towns and six villages, and according to the 2010 US Census, includes more than 51,125 residents. The County is well served by a network of interstate, state, and local highways including Interstates 88 and 81, as well as State Routes 17C, 34, 38, 79, 96, and 434. Easily accessed by major transportation routes, the local economy is dependent on a wide variety of industries including tourism, retail, manufacturing, and education. The majority of the county's residents live within the Town of Owego.



Community Profile

The Town of Tioga is a rural, bedroom community located in the center of Tioga County, and encompasses approximately 59 square miles. There are four hamlets located within the Town: Tioga Center; Smithboro; Halsey Valley; and Straits Corners. Tioga is bounded by the Susquehanna River to the south, the Town and Village of Owego to the east, the Town of Candor to the north, and the Town of Barton to the west.



In addition to the Susquehanna River, major water bodies located in Tioga include the Owego and Pipe Creeks. As a part of the Susquehanna River Basin, the Town is located in one of the most flood-prone watersheds in the Country, and is vulnerable to local flash floods which often affect smaller tributaries with little advance warning.

Easily accessible by NYS Route 17C and the Southern Tier Expressway (I-86), the primary industry in the Town of Tioga is agriculture. Other key employment sectors include management and manufacturing.

The Town is home to the Ransom Memorial Park and the Tioga Central School. Tourist attractions include motor sports entertainment at Skyview Drags and the Shangri-La II Motor Speedway, the annual Tioga Center Pumpkin Festival, and sports

and outdoor recreation including hunting, skiing and snowmobiling.

In 2010, the U.S. Census reported that the Town of Tioga’s population was 4,877 residents. This represents a 37 person increase from the 4,840 person population reported in 2000. The median age of community residents was 43.9 years, which is slightly older than the 42.6 years of age reported for the County. The 2010 Census also reported that the Town population was predominately white (99.6%), the median household income was \$43,360 (less than the County figure of \$53,789 and the New York State reported figure of \$56,951), and that approximately 81% of the Town’s housing units are owner occupied and the remaining 19% are rentals.

The Town does not have an adopted Comprehensive Plan, Zoning Ordinance or Site Plan Review. They have established a planning board and subdivision review procedures.

Impact of Tropical Storm Lee

On September 7, 2011, Tropical Storm Lee stalled over the Southern Tier and dropped over 11" of rain on Tioga County during a 24-hour period. The torrential rains, coupled with saturated grounds and a swollen Susquehanna River from Hurricane Irene, led to record high water levels. Reports indicate that the flood waters in Tioga Center associated with Tropical Storm Lee measured four feet higher than those reported during the flood of 2006.

The rising waters of the Susquehanna River caused severe flash flooding, and destroyed homes, businesses and infrastructure. Many of the roads in Tioga were closed, including Halsey Valley, State HWY 96, Glen Mary Drive, Sections of State Rt 17C and Allyn Road.

The extreme rains associated with Tropical Storm Lee also caused the water in Pipe Creek to overrun its banks. Excess velocity, coupled with sediment and debris in the Creek, caused an estimated \$1.6M in culvert repairs. The Tioga Central School District

bus garage located in Tioga Center sustained approximately \$300K in damage, and the Town's Ransom Park required \$100K in repairs.

On September 10, 2011, the Tioga County Emergency Management Office requested the assistance of the Disaster Assistance Response Team (DART) to inspect 3,750 homes in Tioga County. Of those homes requiring inspection, 400 were located in the Town of Tioga. The residential areas hardest hit were located along Dubois and Halsey Valley Roads. FEMA estimates the damage to residential structures in the Town of Tioga to be \$1.5M. In 2012, the Town requested FEMA buyout assistance for 14 homes.

The flood waters not only caused damage to residential property, but to agricultural lands as well. Stream bank erosion resulting from Tropical Storm Lee has reduced the number of productive agricultural acreage, negatively impacting farming operations in the community.



“...a couple more floods like we've had, and I'm afraid we will be a ghosttown.”

Extreme Weather Events

According to the recent report, *ClimAID: the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State*, the need to plan for the mitigation and recovery from future flood events in the Town of Tioga, and the entire Southern Tier, is a growing concern as we move through the 21st century.

In 2008, the New York State Energy Research and Development Authority (NYSERDA) initiated “ClimAID” as part of its Environmental Monitoring, Evaluation, and Protection Program (EMEP). As part of the project, a three-year study was conducted by more than 50 scientists from Cornell University, Columbia University, and the City University of New York to identify and assess climate change impacts and adaptation options for New York

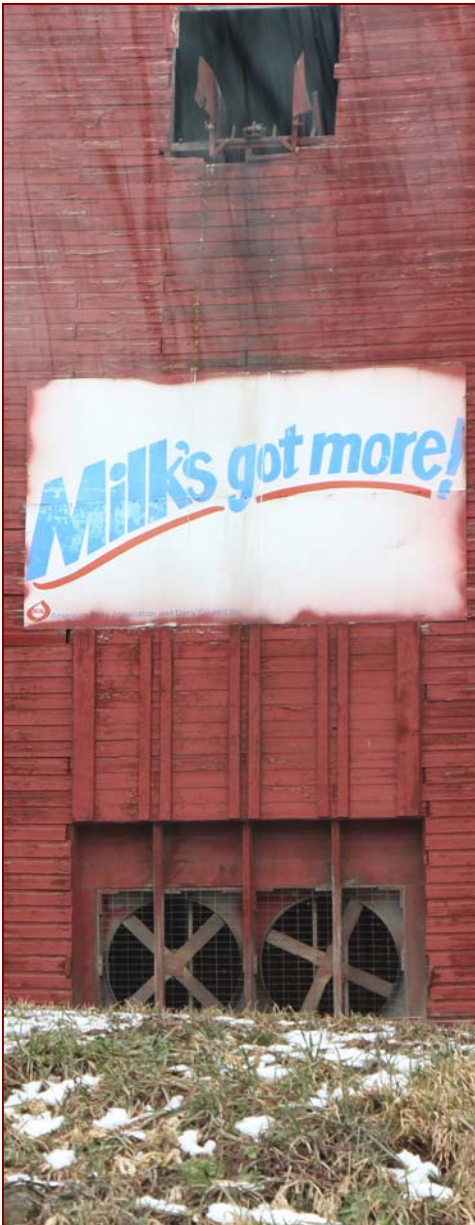
State.

The results of the study were compiled in the 600-page report that warns that New Yorkers should begin to prepare for an increased number of heat waves and snowier winters, severe floods, and a range of other effects on the environment, communities and human health. Average annual temperatures in New York State are projected to rise by 4 to 9 degrees by the year 2080, and the amount of precipitation that falls in the State is projected to increase by 5 to 15 percent.

A summary of extreme weather events predicted for the Southern Tier in the 21st century is provided below:

ClimAID Region 3 (Southern Tier): Projected Extreme Events					
	Extreme Event	Baseline	2020s	2050s	2080s
Heat Waves	Number of days/year with maximum temperature exceeding 90° F	10	11 - 25	15 - 45	19 - 70
	Number of days/year with maximum temperature exceeding 95° F	1	2 - 7	2 - 18	4 - 38
	Number of heave waves/year	1	1 - 3	2 - 6	2 - 9
	Average duration of heat wave	4	4 - 5	4 - 5	4 - 7
Cold Events	Number of days/year with minimum temperature at or below 32° F	152	116 - 145	86 - 168	68 - 124
Intense Precipitation	Number of days/year with rainfall exceeding 1 inch	6	5-8	5 - 8	5 - 10
	Number of days per year with rainfall exceeding 2 inches	0.6	0.5 - 1	0.5 - 1	0.4 - 2

Public Participation



The goal of public participation during this project was to foster communication, create a sense of ownership and build trust between the public, Tioga County, the Town of Tioga, and regulatory agencies during the course of the LTCR study. Citizen participation provides an opportunity to compile the public's knowledge regarding the history of the community and understand the public's hopes, concerns and desires for the future of the Town.

To gather public input, the Project Team worked closely with the LTCRS Executive Committee, Tioga LTCRS Steering Committee, collected input from various stakeholders, and community residents, business owners and representatives from the agriculture community. In total, there were two public meetings including a public workshop, several stakeholder interviews, and a series of Steering Committee meetings.

LTCRS Executive Committee

In November of 2011, the NYS Department of State announced funding for the Long Term Community Recovery program. The program provides financial and technical assistance to those towns and villages hardest hit by Tropical Storms Irene and Lee, and provides communities with the tools they need to develop a vision and strategies to reestablish themselves as vibrant communities that are less vulnerable to future disaster.

The Town of Tioga, along with the Village of Owego, the Village of Nichols and Town of Nichols, applied for and received Long Term Community Recovery grant funding. As the first step in the planning process, local leaders from each of the communities were invited to join a LTCRS Executive Committee.

Members of the Executive Committee include:

- Kevin Millar – Village of Owego
- Jana Ingalsbe – Village of Owego
- Louis Zorn – Town of Tioga
- Drew Griffin – Town of Tioga
- Barb Crannell – Town of Nichols
- Ches Spencer – Town of Nichols
- Elaine Jardine – LTCRS Coordinator

Executive Committee members served on the consultant selection team, organized the Community Workshop, attended a multi-state Peer-to-Peer Long Term Recovery Meeting, and have provided general guidance to the local Steering Committees.



Tioga LTCRS Steering Committee

In the summer of 2012, a Steering Committee comprised of a cross section of the Town including representatives from local government, local government, business and the agriculture community were assembled. This committee was tasked with developing the Tioga Long Term Community Recovery Strategy (LTCRS) which will serve as a guide to making flood-related decisions to ensure a more sustainable and resilient future for the Town of Tioga.

Steering Committee members include:

- Lou Zorn, Chair
- Jeff Barnes
- Frank Catalano
- Drew Griffin
- Milt Kemp
- Robert Klossner
- Robert Strong
- Scott Taylor

Steering Committee members worked with the project team from Elan Planning, Design, and Landscape Architecture (Elan), New England Environmental (NEE), and Griffiths Engineering to identify issues and concerns, draft a community vision, identify recovery strategies, and to prioritize long term recovery projects.

Stakeholder Interviews

As part of the public participation process, the Project Team met with several key stakeholders in the community to gain a better understanding of the impacts of Tropical Storm Lee as well as ongoing recovery efforts. Stakeholders included representatives from the Tioga County Soils and Water Conservation District, local farmers and Tioga Center Fire and Emergency Squad.



Public Workshop

On October 25, 2012 the LTCRS Executive Committee hosted a public workshop at the Hubbard Auditorium located in the Tioga County office building. The event was publicized in print and electronic media (Owego Penny Saver, WBNG Binghamton), on the County website, and flyers were posted in local businesses and not-for-profit organizations. The workshop included a brief presentation about the LTCRS program, and then provided residents with an opportunity to share their ideas about how to make their community flood resistant and describe their vision for recovery.

As part of the public workshop, the residents of the Town of Tioga were asked to identify their community’s strengths and the challenges that they faced as a result of Tropical Storm Lee. A summary of their comments is provided.

Strengths	Challenges
Good school and emergency service	Communication was a big issue during the storm
Ransom Park	There was no way to communicate with the County Emergency Command Center
Rural quality, agricultural community	No official or unofficial plan for land use
Environmental quality	Health related concerns after the storm (water, septic)
Recreation – good fishing and hunting	Mitigation controls needed
Easy access to the Interstate	Debris in creeks
No zoning	Today people are just not prepared for disasters
Excellent bedroom community	Need a plan to educate residents
Good people/community – “they are tenacious”	No holding systems in place – too much water, too fast and can’t control it

You're Invited!

Come Share Your Ideas to Make
Your Community Flood Resilient

October 25, 2012
6:00 pm - 8:00 pm

Hubbard Auditorium
Tioga County Office Building
56 Main Street
Owego, NY

The Village of Owego and the Towns of Tioga and Nichols are each developing a Long Term Community Recovery Strategy to address flooding concerns in your communities.

Please join us and let us know...

- What you love about living and working in your community
- Your issues and concerns regarding recent flood events
- Your vision for your community



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Community Vision for Recovery

As part of the public workshop, community residents were asked to describe their vision of what the Town of Tioga would be like twenty years from now. A snapshot of their responses is provided below:

- Homes will either be gone or elevated
- More homes built out of the flood zone/higher elevation
- Derelict homes gone, trash will be gone, community revitalization has taken place, houses painted
- Full parking lot at church, championship banner at the school
- More business in Town (general store, small mom and pops, anything that doesn't take a big footprint, cottage industries) located north of Route 17c
- Good interstate access
- "dry"
- Lower taxes
- Lockheed-Martin expansion
- Municipal water/sewer expanded if there is additional development
- Explore municipal water and sewer – would serve to increase/attract development
- Vital community assets will be dry!

Using the input provided during the public workshop, coupled with their own knowledge of the Town, the Steering Committee developed a vision statement for the Town of Tioga LTCRS.



Vision Statement

The Town of Tioga is a beautiful picturesque agricultural community. We have a broad diversity of assets including:

- A wide variety of cottage industries & family farms, making for a strong economic base.
- Tioga has many opportunities for outdoor recreation including bicycle trails, hunting, fishing, watersports, ATV & snowmobile trails to name a few.
- With the high performing Tioga Central School District our town offers outstanding educational opportunities for your children.
- We have many local churches with vital congregations that are actively involved in supporting our community.

Tioga is a well educated, progressive community endeavoring to stay both safe & viable. We cordially invite you to come and see for yourself why so many families call Tioga home!



Peer to Peer Meeting

On April 27, 2013, FutureScapes, a 501(c)(3) nonprofit organization, hosted a Long-Term Recovery Peer to Peer Meeting in Sayre, PA. During the four hour meeting, representatives from the Town and Village of Nichols, the Village of Owego, and Tioga County were joined by their counterparts from Athens, PA, West Pittston, PA, and Shickshinny, PA to discuss how their communities were impacted by Tropical Storm Lee and share their experiences preparing and implementing long term community recovery plans.

Topics of discussion, facilitated by Community Recovery Specialists from FEMA, included:

- Successes and challenges associated with the long-term recovery process
- Community involvement and volunteer management
- Mitigation measures
- Working with local government and elected officials
- Grants and fundraising efforts
- Partnerships and shared resources

At the close of the meeting, all of the participants agreed that steps should be taken to set a future meeting date and to continue the collaborative approach between the communities. Ideas for future meetings include site visits to peer communities to share success stories and brainstorming sessions to identify best practices to shared challenges.



Existing Conditions



To gain a better understanding of the existing conditions in the Town of Tioga, the Project Team conducted an inventory and analysis of the existing land use tools, local and regional planning studies, and natural resources. This analysis, combined with input from stakeholders, the Steering Committee, and the public, helped to shape Tioga’s flood mitigation and recovery strategies in a manner that meets the Town’s long-term vision and goals.

Existing Resources

As part of the planning process, the Project Team reviewed the following local and regional planning studies as well as local legislation:

- 2012 Tioga County Hazard Mitigation Plan (Section 9.15: Town of Tioga)
- 2012 Tioga County Emergency Management Plan (CEMP)
- 2012 Tioga County After Action Report/Improvement Plan – Tropical Storm Lee Flood Response
- 2010 Upper Susquehanna River Basin, NY: Flood Risk Management and Watershed Assessment
- U.S. Department of Commerce National Oceanic and Atmospheric Administration: Remnants of Tropical Storm Lee and the Susquehanna River Basin Flooding of September 6-10, 2011
- Town of Tioga Code
- Ransom Park Master Plan

Land Use

The Town of Tioga is located in Tioga County in the Southern Tier of New York State. It is approximately 58 sq. miles, sharing its entire southern border with the Susquehanna River. The Tioga Town Center is approximately .3 miles west of the north bank of the Susquehanna River on historic floodplain soils. Tioga Center sits on the upper floodplain of the Susquehanna River. The section of the Susquehanna River between Smithboro and Tioga Center has a series of floodplains with varied elevations stepping down to the River. Tioga Center is a hamlet approximately .25 square miles and is comprised of: the intersection of several important roads such as Route 17C, Halsey Valley Road, 5th Avenue, and Allyn Road; Owego Creek; important natural resource features such as the Susquehanna River to the south and east, and Pipe Creek to the east; and the Tioga Central School, an important educational and community resource. A double rail line is located south

of 17C and runs along the floodplain of the Susquehanna River. Tioga Town Center is surrounded to the west, north, and east by the forested and agricultural landscape of the Town of Tioga.

The types of land coverage in the Town of Tioga can be generally described as rural. Within the small town center, the Tioga Central School occupies approximately 2% of the total land area. The remaining land surrounding the hamlet is predominantly agricultural land (approx. 40%), forest land (approx. 57%), and river and stream tributaries to the Susquehanna (approx. .5%). Note: This does not include the open water square footage of the Susquehanna River because the town boundary does not encompass the Susquehanna.

Natural Resources

The Town and Town Center of Tioga, as well as the watershed ecosystems in the Southern Tier region, were most recently inundated by Tropical Storm Lee (2011) and Hurricane Irene (2011). These recent storms caused rivers, streams, floodplains, and wetlands to overflow their banks throughout the watershed, resulting in fractured infrastructure networks like roads, flooded houses and schools, decimated village and town centers, and significantly altered the shape and function of riparian ecosystems. Many areas within the Town were severed from emergency services due to the flooding and destruction of roads and utilities. These flooding events were so severe that FEMA (Federal Emergency Management Agency) has updated and expanded the flood mapping throughout many towns in the Southern Tier.

Over the past decade, this region has seen two 100-year flood events and one 500-year flood event. Each storm event and subsequent flooding impacts the watershed in different ways. In many cases, these storms have altered the streams, creeks and rivers within the watershed by eroding the banks of the water body and creating unstable riparian areas. The sediment and debris that has eroded from the up-slope areas of the watershed moves down stream and settles in areas of the water body that may already be impounded by culverts or debris, or in “slack water” areas of the River or Stream. This erosion and deposition/ sedimentation effect reduces the volume of water that the channel can allow to pass within its banks.

The flood damage from these storm events may also be attributed in part, to the rise of the Susquehanna River. The Susquehanna River is the outlet for many of the creeks and streams in the Southern Tier.



The increased elevation of the River causes the flow of water from the tributaries into the Susquehanna River to slow, and reduces the ability of the tributaries to drain water in the watershed. The outflow vicinity of the tributaries and their adjacent floodplains become inundated with “backwater” from the Susquehanna River and water flowing from up-slope in the watershed. This can cause the River and stream tributaries and riparian ecosystems in the watershed to overflow their banks, resulting in flood damage to utilities, infrastructure, and property.

Some storm events can cause the River and stream tributaries to breach their banks first, while the Susquehanna River is still within its banks. This can be caused by a narrowing or an obstruction in the river or stream channel.

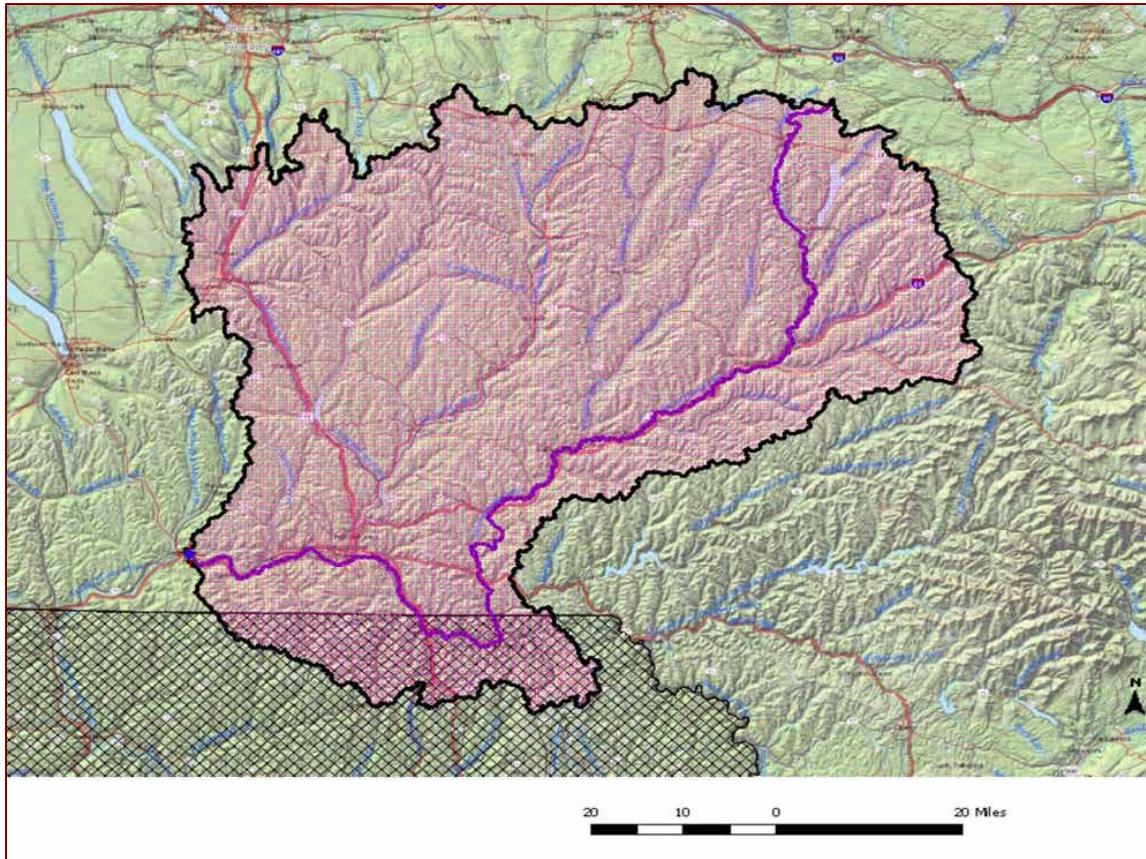
Generally, most of the creeks and streams within the Town are eroded and void of vegetation on the slopes of the banks, causing an excessive amount of sediment to flow downstream during even a normal high water event. This sediment often collects at pinch points in the stream such as culverts, bridge abutments, or a crossing with a center pier that collects debris during the high water event. This debris can create a pinch point or exacerbate the man-made pinch points or structures in the water body, and reduce or obstruct the channel's ability to convey the stormwater. This can cause a stream to top its banks, create a ponding condition above the stream banks, and flooding the adjacent areas.

The volume and velocity of water will find its way around the impoundment and scour the downstream side of the pinch point, eventually causing a failure of the obstruction, and allowing this built-up ponded area on the up-gradient side to release downstream.

When these events occur, the rivers and streams cannot handle the volume and velocity of water, thus causing massive amounts of erosion on the banks, undercutting the vegetation and sending it down stream. When the flood water recedes, the debris often remains in the channel, locked into culverts, spread throughout the floodplain, and ultimately into the Susquehanna River.

The flow, direction, and watershed of the Susquehanna River are important considerations regarding flood impacts. The Susquehanna River flows northeast to southwest along the Tioga Town boundary and is void of significant changes in flow direction, such as those found at the town centers of Nichols and Owego. The Susquehanna River currently turns slightly away from the Tioga Town Center in a southeasterly direction. This movement in the River has allowed a floodplain to emerge as sediment in the River is deposited in the slow moving waters near the Town Center.





The Susquehanna River has a watershed size of approximately 4570 square miles at a point near the Tioga Town Center. The watershed generally is comprised of moderate to high sloping terrain with a shale bedrock base at varied depths. In large rain events, rainwater is conveyed in stream tributaries at a high velocity through the localized watersheds, flowing down slope into the Susquehanna River. The high velocity conveyance of rainwater from the tributaries to the outflow can create a situation in which the Susquehanna River water elevation rises quickly to a bank-full condition in short time. This condition is often referred to as a “flashy” stream system, where the time between when the rain water falls on the ground to when it is conveyed through the watershed occurs quickly.

Figure 1: Susquehanna River Watershed from the Village of Owego up-gradient (Stream Stats - <http://streamstatsags.cr.usgs.gov>)

Pipe Creek, located at the northern edge of the Town, has a localized watershed of 46.4 square miles with approximately 68% of the watershed being covered by forest. This Creek has historically overtopped its banks during large rain events, causing flooding and damaging parts of the Town's infrastructure, as well as flooding the middle school. When the Susquehanna River elevation rises, the bottom of this creek will start to back up, creating flooding in Tioga Center. Undersized culverts under the rail bed are also thought to contribute to the flooding within this creek. The Town has worked with the Tioga County Soil and Water Conservation District to help reduce the impact of this creek during large rain events and has begun to implement some of those mitigation measures.

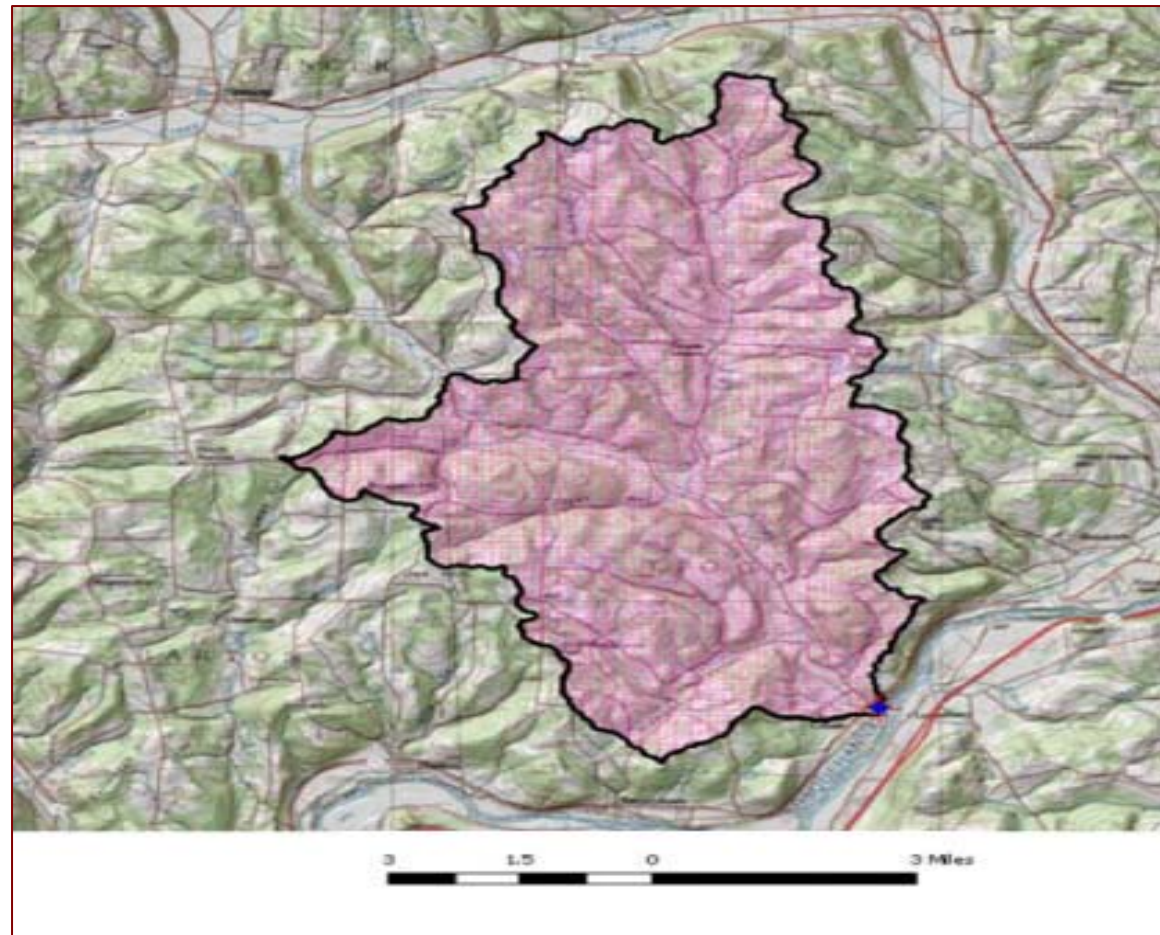
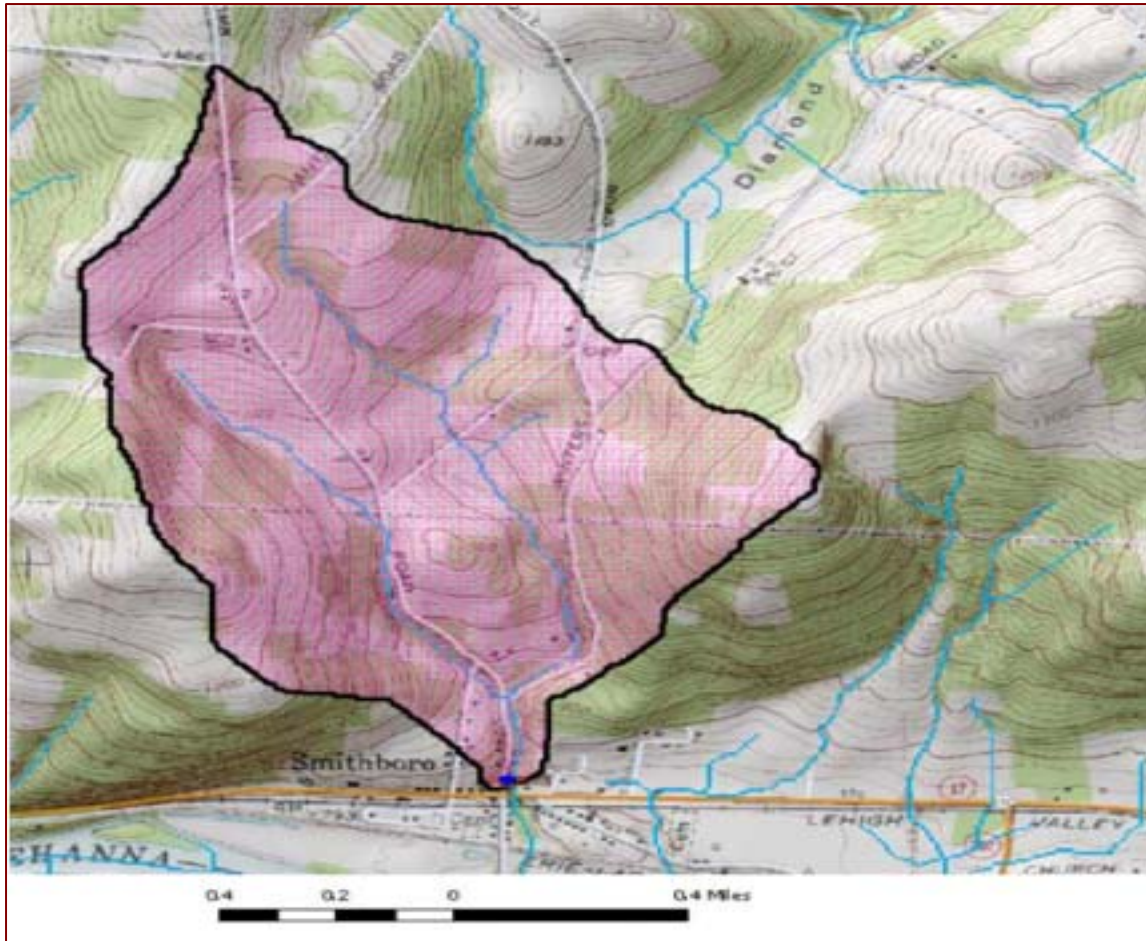


Figure 2: Pipe Creek Watershed (Stream Stats - <http://streamstatsags.cr.usgs.gov>)



Smithboro Creek, located on the western side of the Town, has a watershed size of 1.14 square miles and drains from the north to south of Smithboro, flowing under 17C, and meeting the Susquehanna River at the southwestern side of the Town boundary. This Creek historically will overtop its banks during large localized rain events. This Creek is extremely flashy and has caused large pockets of erosion that move down stream, clogging culverts and impacting the Town's infrastructure.

Figure 3: Smithboro Creek (Stream Stats - <http://streamstatsags.cr.usgs.gov>)

Owego Creek, on the eastern boundary of the Town, has a watershed size of 341 square miles, and drains from the north to the south, meeting the Susquehanna River at the southwestern corner of the of the Town boundary. This Creek historically will overtop its banks during large flood events, specifically when the Susquehanna River elevation rises, creating back water effect and flooding toward the direction of Owego. However, tributaries into Owego Creek will back up as well, creating localized flooding within Tioga.

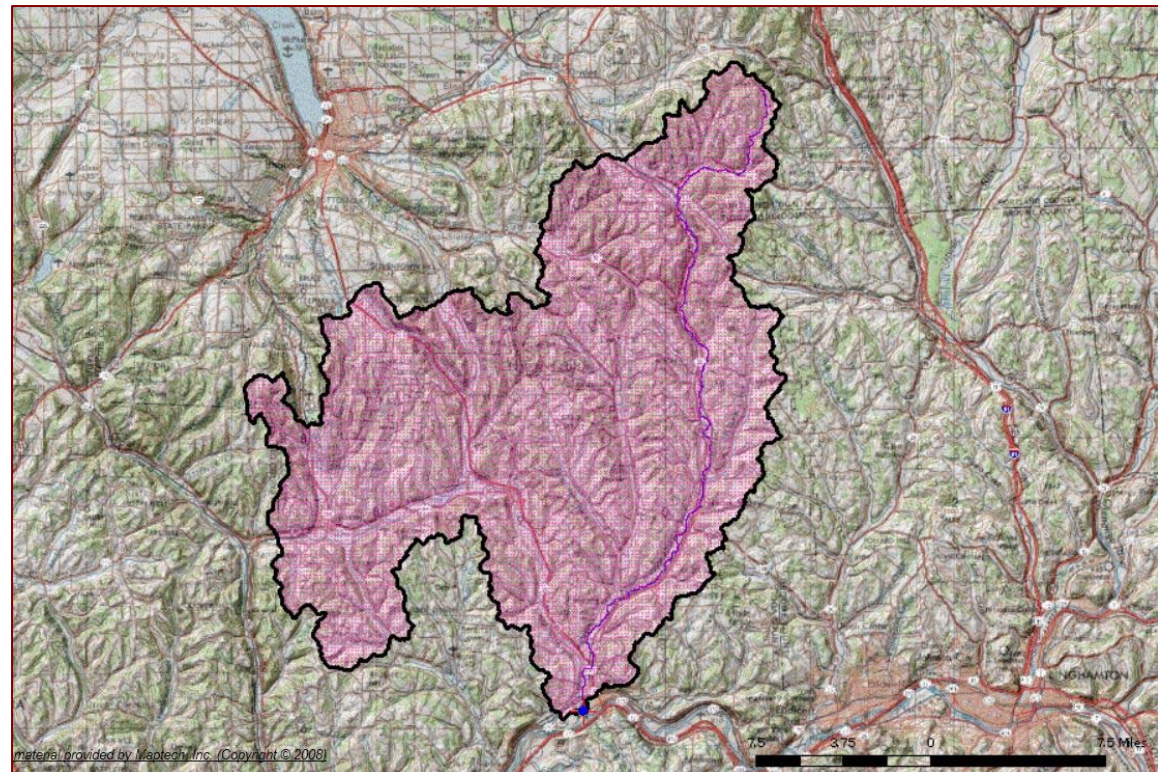


Figure 4: Owego Creek Watershed (Stream Stats - <http://streamstatsags.cr.usgs.gov>)



Figure 5: Pipe Creek Locus Map for Reference Reach Example
(Google Maps)

New England Environmental conducted a small scale geomorphic assessment on a stretch of Pipe Creek just south of Allyn Road (see photograph to the left). This site was chosen because of the Town's desire to use the field adjacent to the Creek to the north as a potential site for flood storage and mitigation. The information gathered was used to determine the Creek profile and longitudinal survey. This information can also be used to analyze and compare the data against regional data, providing a picture of the overall health, stability, relative dimensions, and slope of the Creek through this reference reach. This study will determine a classification for the stream channel in this location using Rosgen's Stream Classification System. This classification system compiles all the data collected during the survey to determine the classification. This classification will allow for the municipality to predict how the channel will react and adjust during high flooding events. This information is also used to determine what restoration techniques may be used if a stream is unstable and needs to be restored.

The information gathered during the site visit was used to create Creek profiles. Figure 6 depicts a longitudinal profile of the Creek surveying parallel to the flow of the River, taken at the thalweg (the deepest section of the Creek).

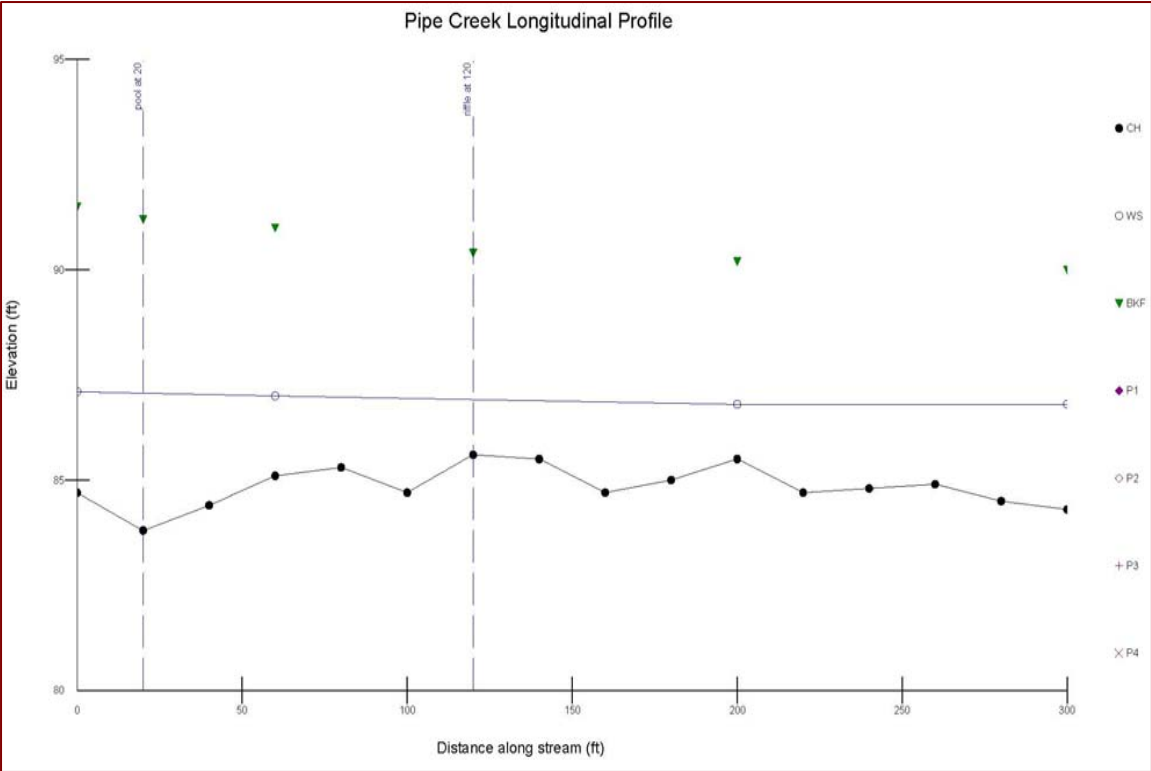
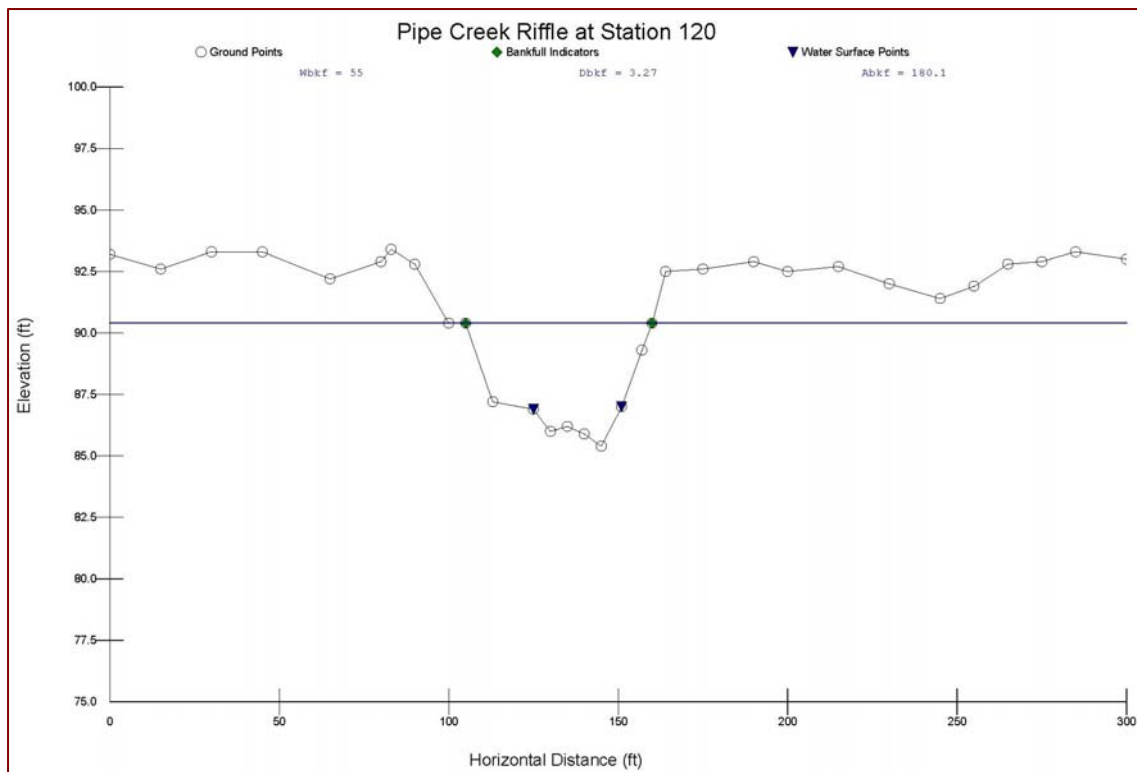


Figure 6: Pipe Creek Longitudinal Profile



Once the longitudinal profile was created, two cross sections were taken; one in the shallowest section (Riffle) and one in the deepest section (Pool).

Riffle Cross Section Dimensions:

- Width at bankfull = 55 feet
- Depth at bankfull = 3.27 feet
- Bankfull area = 180.1 square feet.

Figure 7: Pipe Creek Riffle Cross Section

Pool Cross Section Dimensions:

- Width at bankfull = 79.1 feet
- Depth at bankfull = 3.8 feet
- Bankfull area = 300.5 square feet.

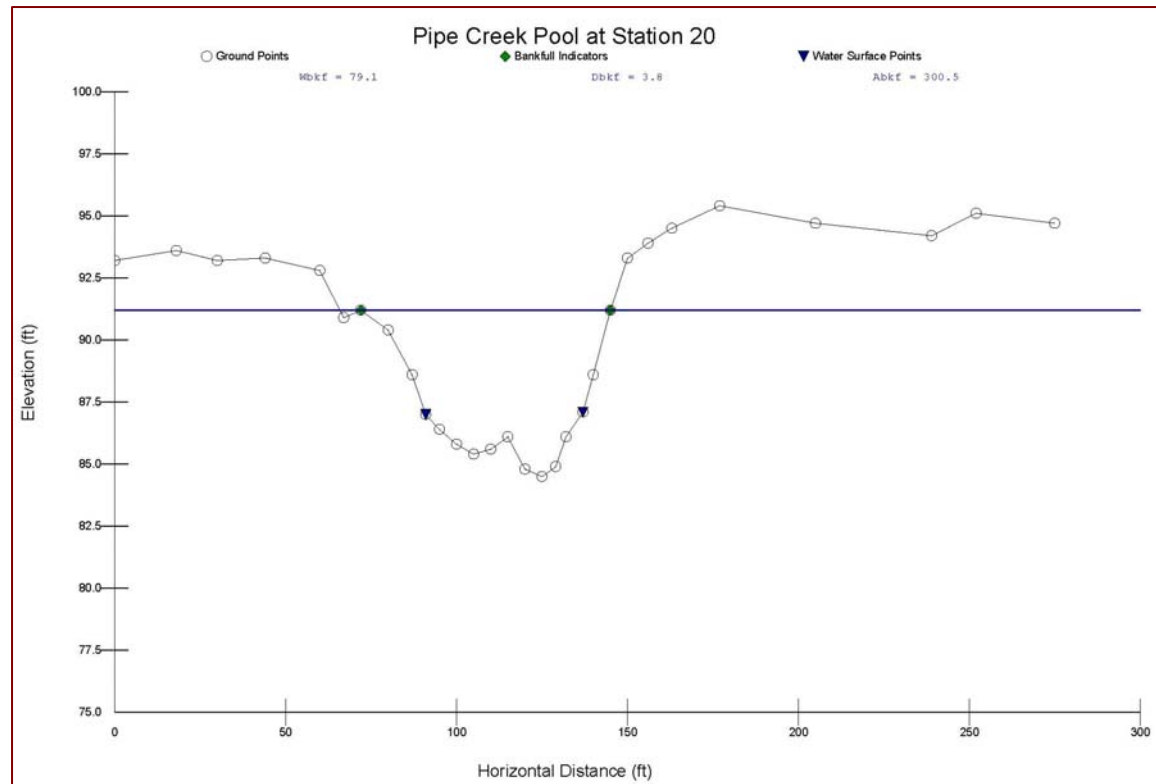


Figure 8: Pipe Creek Pool Cross Section

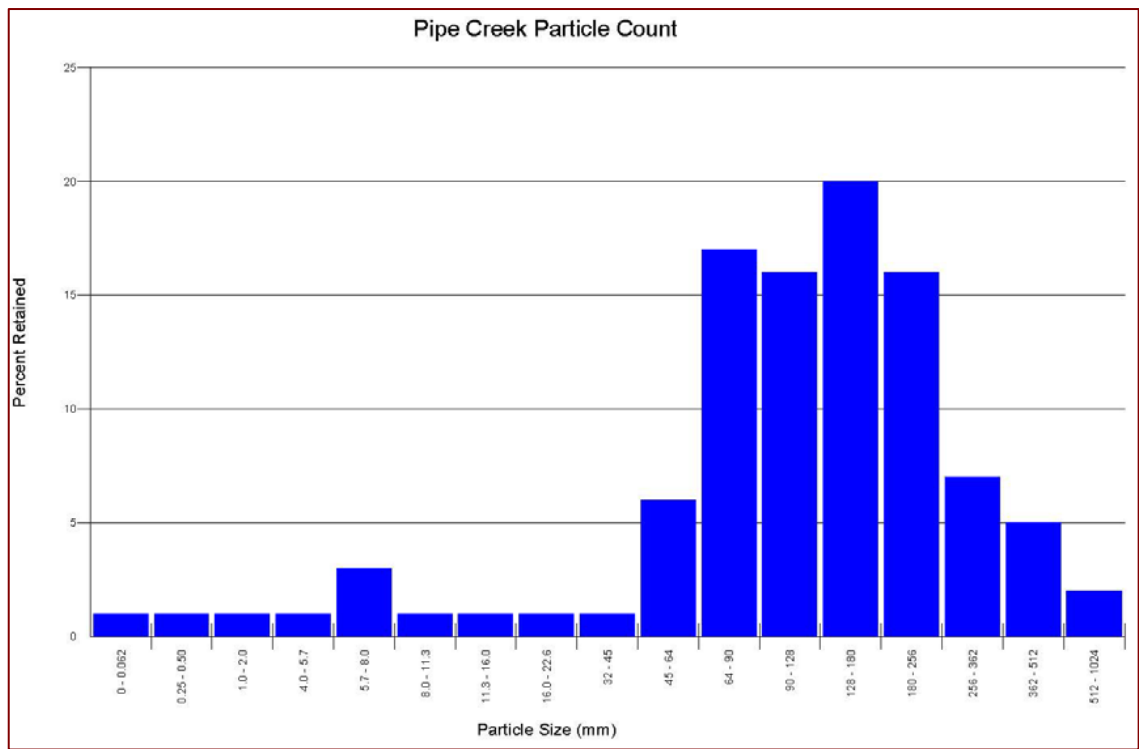


Figure 9: Pipe Creek Particle Count Bar Graph

Upon completion of the Pool and Riffle cross-sections, the substrate of the channel was measured. This process (Pebble Count) was completed by blindly measuring 100 particles' diameter across the reference reach area. This information was used to get a gradation of the material found the channel reach.

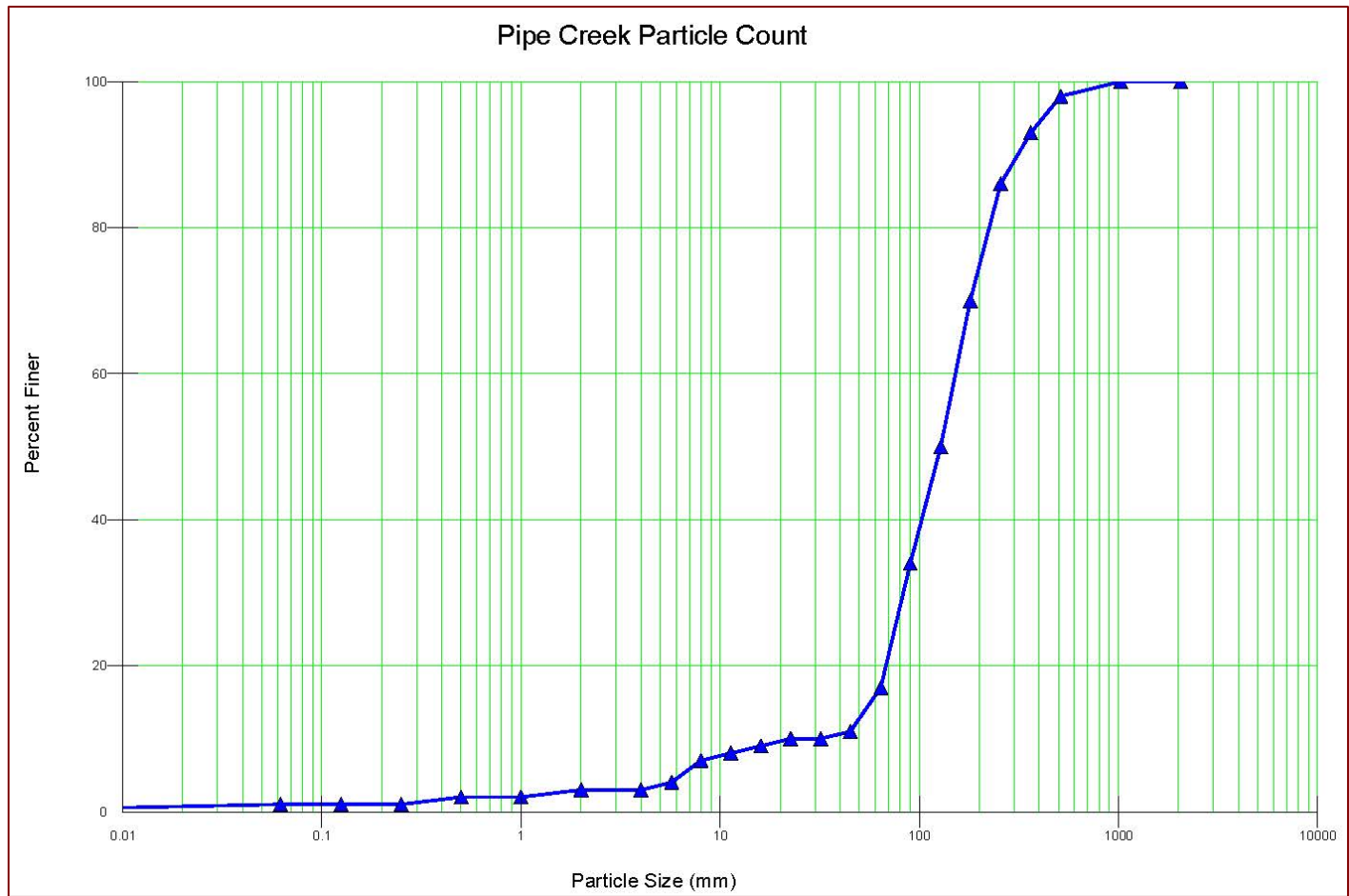


Figure 10: Pipe Creek Particle Count Linear Graph

PIPE CREEK RIVERMORPH STREAM CHANNEL CLASSIFICATION

River Name: Pipe Creek	
Reach Name	Reach 1
Drainage Area	45.7 sq mi
State	New York
County	Tioga
Latitude	42.06194
Longitude	76.05
Survey Date	12/05/2012
Surveyed By	Andrew Bohne and Jesse Laford
Classification Data	
Valley Type	Type VIII
Valley Slope	0.0113 ft/ft
Number of Channels	Single
Width	55 ft
Mean Depth	3.27 ft
Flood-Prone Width	300 ft
Channel Materials D50	128 mm
Water Surface Slope	0.0093 ft/ft
Sinuosity	1.21
Discharge	1168.849 cfs
Velocity	6.49 fps
Cross Sectional Area	180.1 sq ft
Entrenchment Ratio	5.45
Width to Depth Ratio	16.82
Rosgen Stream Classification	C3

Once all the information was collected, the classification information to the left was calculated.

Based on the regional curve data on the graph to the right, it is evident that generally a river with a watershed 45.7 square miles in size will have a bankfull width of approximately 90 linear feet, a bankfull depth of approximately 3 linear feet, and a bankfull area of approximately 250 square feet.

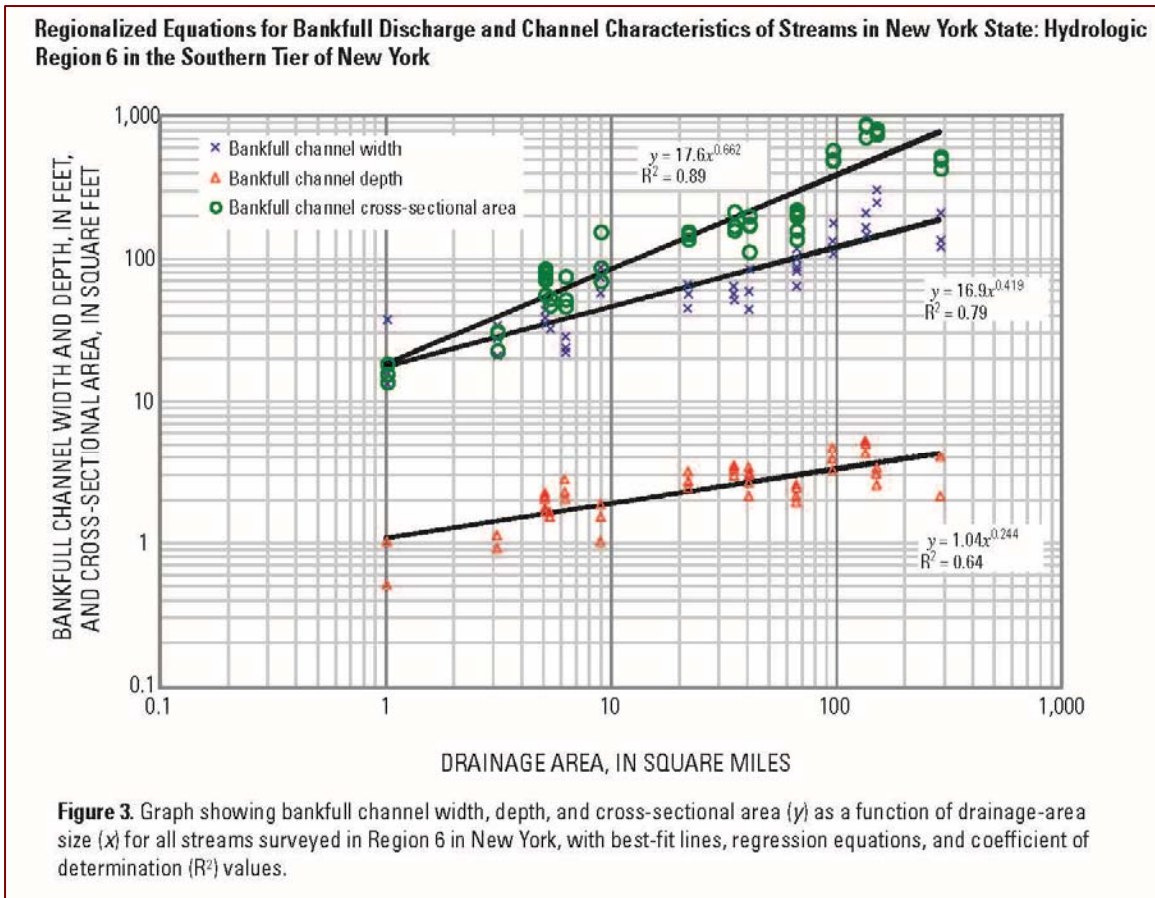


Figure 11: Southern Tier Regional Curve Data
(USGS Regional Curve Data for Region 6 – Southern Tier)

Summary

Analyzing the data collected in the field and comparing this data to the regional curves will help the Town of Tioga understand the overall conditions of their streams and rivers. It is important to note that Pipe Creek was recently re-shaped prior to the survey. This section of the Creek seems to be narrower and deeper at bankfull, and not as deep as the average streams with a similar watershed size, based on the regional curve data. The Susquehanna River's proximity to this site will have an impact on the dimensional profile; as the Susquehanna River level rises it will back up with sections of the Pipe Creek, creating a ponding effect. When this section of the Creek begins to pond, the velocity of the River is reduced, impairing the River's ability to properly move sediment. Thus, sediment and debris will fall out of the water column at this location. The presence of very large sediment islands at this location are evidence that this sedimentation is occurring.

The Creek seems to be incised and down cutting at this location, and lacking a connection to the floodplain on both sides of the River during high flow events (less than a 50-year storm event). When the River begins to down cut and becomes disconnected to the floodplain, the velocity of the Creek cannot slow down and will cause massive erosion along its banks.

The eastern and western edge of the Creek at this location has large deciduous trees at the top of its banks, but is void of vegetation and extremely unstable, collapsing under foot on the slope of the bank. The lower slopes on the western and eastern bank of the Creek have been stabilized with large angular stone, as they are void of trees and shrubs. The eastern floodplain was a large open agricultural field, that often floods on the southern side during large flooding events.

These banks should be stabilized with native vegetation to help reduce the excessive movement of sediment downstream into the Susquehanna River. The field to the east of Pipe Creek is a good example of an area that could be used for flood storage, reconnecting the Creek to its floodplain. It should be noted that creating flood storage and mitigation will be most effective when it is developed within the upper watershed, slowing the storm surge before it reaches the next lower watershed. This area should be continually monitored to ensure that the channel maintains its pattern and profile.

This location on Pipe Creek, with its proximity to the Susquehanna River, will continue to flood. Development should be avoided within the floodplain to the maximum extent possible. This will help reduce the financial, cultural, and ecological impact of future flooding.

This information can also be used to model how the streams will perform during certain rain event (i.e., 5, 10, 50, 100 and 500 year storms). This information will be extremely useful in determining at what level of rain event (in inches) flooding will begin to occur. Surveying, modeling, and completing the overall geomorphological assessment will help guide the town in developing possible flood mitigation measures, as well as aid in planning for emergency management and response.

Flood Mitigation and Prevention Projects

This Long Term Community Recovery Strategy (LTCRS) expresses the Town's vision for recovery following the flood-damage caused by Hurricane Irene and Tropical Storm Lee. During the public participation process, it became clear that one of the community's biggest concerns was taking steps to reduce future flood damage and loss. The Steering Committee recognizes that the majority of the Town of Tioga has been developed in the 100-year flood-plain, and therefore one of the priority areas for long term recovery for the community is Flood Mitigation and Prevention.

Recommended Flood Mitigation and Prevention recovery projects include both pre- and post-disaster mitigation actions that are designed to either prevent the occurrence of an emergency or reduce the community's vulnerability in ways that minimize the adverse impact of future flood disasters.

As part of the planning process, the Tioga LTCRS Steering Committee identified six initiatives that support the community's overall vision with respect to flood mitigation and prevention activities:

- Prevention Activities
- Property Protection
- Emergency Services Measures
- Public Information
- Structural Projects
- Natural Resource Protection



Prevention Activities (PA)

Background

Simply stated, flood mitigation and preventive activities keep problems from getting worse. The use and development of land located in floodplains and watersheds can have a direct impact on the movement and storage of water. If not designed and built with consideration to the floodplain or in areas vulnerable to flooding, new uses could negatively impact the community causing an increase in erosion or flood damages to the property itself or to other lands within the community. To prevent and minimize damages during a flood event and to ensure sound use and development of areas of special flood hazard so as to minimize future flood blight areas, Tioga can strengthen existing land use regulations and institute new measures to help control the type, amount, and location of new development within the Town especially within the floodplain.

Land use planning can be an effective tool to reduce the risk to life and property in the event of a future flood event. Improved land use tools, such as site plan review, overlay districts and zoning regulations can reduce risk to people and property in the event of a future flood. These land use tools are often administered by the code enforcement officials.

Goal

Ensure that there is proper language in plans and ordinances to protect properties within the Town of Tioga from future flooding.

Prevention Activity Recovery Projects

The Tioga LTCRS Steering Committee identified three Prevention Activity recovery projects.

- PA-1: Develop and Adopt a Site Plan Review Ordinance that Connects with the Floodplain Damage Prevention Local Law for Commercial Development along Route 17c
- PA-2: Encourage New Construction/Redevelopment within 100-year Floodplain to be Built on Piers
- PA-3: Customize Local Laws to “Floodproof” New or Replacement Homes

PA-1: Develop and Adopt a Site Plan Review Ordinance that Connects with the Floodplain Damage Prevention Local Law for Commercial Development along Route 17c

Project Description

To assist with the review of proposed new commercial development along 17c, it is recommended that the Town create and adopt a site plan review ordinance which requires applicants proposing new commercial development file a site development plan for review and approval. The site development plan should specify the present characteristics of a particular parcel of land and its surroundings and describes intended activities and their potential impact on the community and adjacent neighborhood.

Site development plans have two functions. First, they illustrate the intended design, arrangement and uses of the land to be improved. Second, they describe the proposal's physical, social and economic effects on the community. The plans may be in either or both narrative and graphic form, as appropriate. Information on factors such as: means of access, parking, landscaping, buffers, architectural features,

location of structures, impact on adjacent land uses and other elements related to the health, safety and general welfare of the community are often considered during the review of the plan. In most communities, the responsibility of reviewing the site development plan typically falls to the Planning Board.

NYS General Town Law, §274-a provides language that can be adopted in its entirety. The language stipulates what should be submitted as part of a site plan application and provides standard objectives the Planning Board should use in reviewing the application such as means of access, ingress/egress, stormwater, lighting, signage, landscaping, buffers, etc. In addition to the standard objectives, it is recommended that the Town include an objective that directly relates to the Flood Damage Prevention Local Law. This will ensure that all uses requiring site plan approval in the Special Flood Hazard Area

are in compliance with this law, helping to mitigate and prevent future damage.

A link to an publication outlining site review procedure and guidelines is provided below:

http://www.dos.ny.gov/lg/publications/Site_Development_Plan_Review.pdf

Project Champion

- Town Board

Potential Partners

- Planning Board
- Tioga County ED and Planning

Potential Resources

- NYS Department of State, Local Government Training
- NYS Department of State, Local Waterfront Revitalization Program
- Community Development Block Grants

PA-2: Encourage New Construction/Redevelopment within 100-year Floodplain to be Built on Piers

Project Description

For homes that remain in the floodplain, damage that may occur from future flooding can be significantly reduced if the homes are elevated. Rebuilding the home on top of piers, rebuilding the home over a garage, or elevating the homes foundation could accomplish this. To help incentivize homeowners to undertake this type of alteration, the Town could look to provide tax incentives offer some form of tax relief to the value of the improvement.

Section 421-f of the Real Property Tax Law authorizes a partial exemption from real property taxation of the increase in assessed value attributable to reconstruction, alterations or improvements made to residential property. Counties, cities, towns and villages may hold public hearings and then adopt local laws granting the exemption. School districts have the option to pass a resolution providing that the exemption applies to school taxes. When it is adopted, the exemption applies to taxes

and special ad valorem levies; the exemption does not apply to special assessments.

Section 421-f of the Real Property Tax Law sets forth several exemption criteria including:

1. The property for which exemption is sought must be a one or two family residence (question 4).
2. The greater portion of the residence (as measured by square footage) after the capital improvement must be at least five years old (question 5).
3. The capital improvement must be commenced after the date the local law or resolution is enacted (question 6).
4. Unless limited by the local law, the exemption applies to reconstruction, alterations or improvements; it does not apply to ordinary maintenance or repairs. Describe the capital improvement in question 7.

5. The value of such reconstruction, alteration or improvement must exceed the sum of \$3,000 (question 8). Attach documentation (e.g., construction contract, building permit, receipted bills) to support the cost of capital improvement.

Project Champion

- Town Board

Potential Partners

- Planning Board

Potential Resources

- NYS Department of State, Office of Communities and Waterfronts
- Community Development Block Grants
- NYS Hazard Mitigation Grant Program (HMGP)

PA-3: Customize Local Laws to “Floodproof” New or Replacement Homes

Project Description

In 2012 the Town of Tioga adopted a Flood Damage Prevention Law as authorized by the NYS Constitution, Article IX, Section 2, and the ECL, Article 36. This local law indicates that if development is to occur in the mapped flood hazard areas then the development is required to be built to certain standards, identified in the National Flood Insurance Program’s regulations (44 CFR 60.3) and the New York State Building and Residential Codes. If development is being considered for a Special Flood Hazard Area as shown on the FIRM maps, then the local floodplain administrator, an office designated in the local law, reviews the development to ensure that construction standards have been met before issuing a floodplain development permit.

The local law template is provided by NYSDEC and sets forth purpose, objectives, applicability, definitions, and prescribes methods of building in the Special Flood Hazard Area. It is truly intended as a

preventive technique by taking into consideration the base flood elevation and building structures that use techniques to minimize flood damage. It is recommended that the town review this law to determine if any sections could be strengthened to meet the specific needs found in Tioga and/or if the law could incorporate text and language that easily articulates the required standard.



Example of elevated home in the Town of Tioga

For example, section 5.3-1 Elevation requires that, for new residential structures or residential structures proposing

substantial improvements the lowest floor (including basement) be elevated to or above two feet above the base flood elevation (BFE.) The Town could require that, at a minimum, the lowest floor shall be two feet above BFE. The Town could articulate these standards using graphics that illustrate options such as building the first floor above a garage or building the structure on piers. The idea of creating ‘design standards’ to articulate these options is more fully described under Property Protection.

Project Champion

- Town Board

Potential Partners

- Planning Board

Potential Resources

- NYS Department of State, Local Government Training
- NYS Hazard Mitigation Grant Program

Property Protection (PP)

Background

Property protection measures typically relate to individual owners on a building-by-building basis or parcel basis. Examples include relocation efforts, acquisition, retrofitting, and insurance. Often times it is a combination of many of these elements. Property protection methods are not intended to be a 'one size fits all' in form of recommendations. Some options may work well for some building owners and not others. Also, there are many different property types from historic homes to older building stock. In some cases, retrofitting may not be feasible given the constraints of the property.

Goal

Ensure that new development/redevelopment is resistant to flood damage.

Property Protection Recovery Projects

To accomplish this goal, the Steering Committee identified the following Property Protection recovery projects for the Town of Tioga:

- PP-1: Continue participation in the Hazard Mitigation Grant Program (HMGP).
- PP-2: Create a Resource Guide for Building with Flood Damage Resistant Materials.

PP-1: Continue Participation in the HMGP Program

Project Description

In 2012, the Town of Tioga applied for and received funding through the New York State Hazard Mitigation Grant Program (HMGP) Elevation and Acquisition programs. These monies are provided to communities to reduce or eliminate risk and losses, to people and property, from natural hazards and their effects.

The Tioga LTCRS Steering Committee recommends that the Town Board continue to work with residents who have experienced long-term flood damage as a result of Tropical Storm Lee to:

- Designate areas for future buyouts focusing on cost-benefit ratio to justify buyout or elevation
- Promote awareness to homeowners in future buyout areas
- Pursue HMGP funding by the Town Board

Project Champion

- Town Board

Potential Partners

- Save Tioga Center Committee
- Tioga County Emergency Management Office (TCMO)

Potential Resources

- NYS Hazard Mitigation Grant Program (HMGP)

PP-2: Create a Resource Guide for Building with Flood Damage Resistant Materials

If a property is in a flood hazard area, damage caused by flood waters can be reduced, and cleanup made easier by using flood damage resistant building materials. Building materials are considered flood resistant if they can withstand direct contact with flood waters for at least 72 hours without being significantly damaged. "Significant damage" means any damage that requires more than low cost, cosmetic repair (such as painting). As shown in the figure, flood damage resistant materials should be used for walls, floors, and other parts of a building that are below the base flood elevation (BFE). Both FEMA and the U.S. Army Corps of Engineers have published lists of these materials. Commonly available flood damage resistant materials include the following:

- Flooring Materials - Concrete, concrete tile, and pre-cast concrete; latex or bituminous, ceramic, clay, terrazzo, vinyl, and rubber sheets and tiles; pressure-treated (PT) or decay resistant lumber, PT wood and cold-formed steel
- Wall and Ceiling Materials - brick, metal, concrete, concrete block, porcelain, slate, glass block, stone, and ceramic and clay tile cement board, cold-formed steel, and reinforced concrete, polyester epoxy paint, PT and decay resistant lumber
- Other - hollow metal doors, cabinets, foam or closed-cell insulation

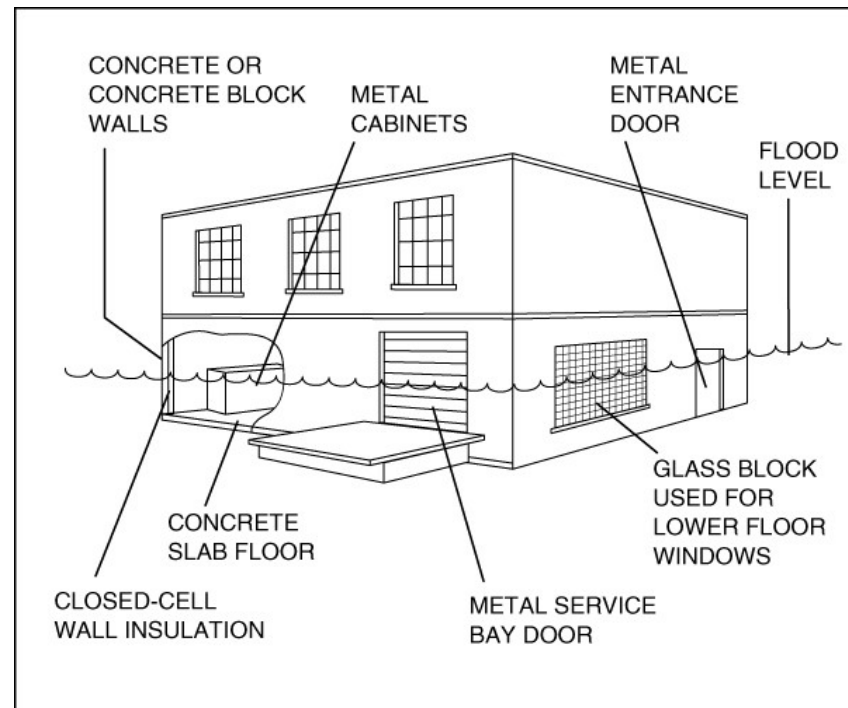


Figure 13: Example of commercial structure built with flood damage resistant materials

Source: FEMA Technical Bulletin 2, Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas,

August 2008

Project Champion

- Resiliency Planning Committee

Potential Partners

- Code Enforcement Officer
- Floodplain Manager

Potential Resources

- The Hurricane Irene-Tropical Storm Lee Business Flood Recovery Grant Program
- New York State Rural Area Revitalization Projects
- New York Works Flood Mitigation and Flood Control Grants
- FEMA Public Assistance (PA) Grant Program
- FEMA Hazard Mitigation Grant Program
- Small Business Administration Disaster Assistance Loans for Homes & Personal Property
- Community Development Block Grant (CDBG) Disaster Recovery Assistance
- USDA Rural Development Rural Repair and Rehabilitation Loans and Grants
- Farm Service Agency Emergency Conservation Program
- New York State Office of Parks, Recreation & Historic Preservation, Historic Preservation Office
- New York State Historic Home Ownership Rehabilitation State Tax Credit

Emergency Services Measures (ESM)

Background

Emergency Services Measures describe those actions taken by Town officials and first responders during a flood event. For the purpose of this study, the Steering Committee also included after action review items in order to improve emergency response during future storm events.

Goal

The goal of the Emergency Services Measures (ESM) recovery projects is to ensure that all residents and critical facilities personnel are alerted and kept informed before, during and after flood events.

Emergency Services Measures Recovery Projects

To accomplish this goal, the Steering Committee identified the following Emergency Services Measures recovery projects for the Town of Tioga:

- ESM-1: Conduct a gap analysis.
- ESM-2: Integrate Citizen Action Group with Emergency Service Measures.

ESM-1: Conduct a Gap Analysis

Project Description

This recovery project seeks to develop a Consolidated Emergency Plan for the Town of Tioga. The Town currently participates in a number of formal and informal emergency management and hazard mitigation plans, including:

- The Tioga County Multi Jurisdictional Hazard Mitigation Plan
- The Tioga County Comprehensive Emergency Operations Plan
- The Town of Tioga Emergency Response Plan (ERP)

Section 9.11 of the Tioga County Hazard Mitigation Plan presents the jurisdictional annex for the Town of Tioga. The plan provides an overview of the community, the history of natural hazards and a prioritized list of proposed hazard mitigation initiatives. The Town's Emergency Response Plan is prepared by first responders and outlines

what the community should do in the event of an emergency.

To ensure an integrated emergency management plan, the Steering Committee proposes the following action steps be taken to develop a consolidated Emergency Plan for the Town of Tioga:

Action Steps

1. Work with Tioga County to review and assess the Town's Emergency Response Plan (ERP) and County's Hazard Mitigation Plan for the Town of Tioga annex
2. Identify the existing gaps between the two plans
3. Consolidate into one comprehensive plan for the Town
4. Coordinate actions amongst all parties to implement (Town, Tioga County,

School, residents, TCEMO, and Fire Department)

5. Periodically test
6. Redefine corrective actions

Project Champion

- Save Tioga Center Committee

Potential Partners

- Tioga County Emergency Management Office (TCEMO)

Potential Resources

- NYS Hazard Mitigation Grant Program
- NYS Office of Emergency Management, Training Needs Assessment

ESM-2: Integrate Citizen Action Group with Emergency Service Measures

Project Description

During the Tioga LTCRS Steering Committee meetings, participants identified the need for communities to be self-reliant during the first 24 hours of a flood events. Developing an approach for how citizens will be involved in the response to a flooding disaster will include planning, training and communication before the event occurs; comprehensive preparedness requires the community to participate. FEMA recognizes how important it is for community residents to be prepared and get involved in emergency events, and not rely solely on the actions taken by the Town and emergency responders. The Town should organize residents and workers around the “Neighbors Helping Neighbors” concept.

FEMA offers a model framework for communities to develop a preparedness and resilience program. The program is known as *IS-909: Community Preparedness: Implementing Simple Activities for Everyone*. Through this program, participants will learn how to describe the role of individuals and households in preparedness and identify community preparedness principles. After completing the appropriate training, participants can take an on-line exam that provides a certification for community preparedness. The Town is strongly encouraged to get residents involved and participate in this on-line training program to organize for future flooding disasters.

Project Champion

- Save Tioga Center Committee

Potential Partners

- Community Care Network of Nichols

Potential Resources

- NYS Hazard Mitigation Grant Program (HMGP)
- NYS Office of Emergency Management, Training Needs Assessment
- NYS Department of State, Local Government Training
- FEMA Emergency Management Institute

Public Information (PI)

Background

Research has shown that an important step to minimizing flood damage and loss is the implementation of public education activities that are initiated at the local level.

Goal

The goal of the Public Information recovery projects in the Town of Tioga is to increase awareness among residents regarding home preparedness and emergency notifications.

Public Information Recovery Projects

To accomplish this goal, the Tioga LTCRS identified the following two Public Information recovery projects:

- PI-1: Create a flood safety awareness brochure.
- PI-2: Develop a Comprehensive Outreach Program.

PI-1: Create a Flood Safety Awareness Brochure

Project Description

When new homeowners, renters and businesses move to Tioga, they should be provided with a welcome packet that includes a Flood Safety Awareness brochure. The brochure would inform residents of the location of flood zones within the Town and outline steps they can take to protect their property and reduce potential losses during a flood event. The brochure could include information regarding:

- The National Flood Insurance Program (NFIP)
- A Tioga flood zone map
- Flood hazard information including important phone numbers (Fire Department, Police Department, Emergency Operation Center, Red Cross, utilities, etc.)
- Information about the Town's Flood Warning System (what does it sound like, what should they do when they hear it)
- Flood safety and preparedness tips
- Evacuation and emergency shelter information
- Steps to follow after the flood (contact insurance agent, take photos of water and damaged property, keep receipts).
- Establish a fee if residents do not evacuate when told to, and are required to be rescued.

Project Champion

- Save Tioga Center Committee

Potential Partners

- Town Board

Potential Resources

- The Hurricane Irene-Tropical Storm Lee Business Flood Recovery Grant Program
- New York State Rural Area Revitalization Projects
- New York Works Flood Mitigation and Flood Control Grants
- FEMA Public Assistance (PA) Grant Program
- FEMA Hazard Mitigation Grant Program
- Small Business Administration Disaster Assistance Loans for Homes & Personal Property
- Community Development Block Grant (CDBG) Disaster Recovery Assistance
- USDA Rural Development Rural Repair and Rehabilitation Loans and Grants

- Farm Service Agency Emergency Conservation Program
- New York State Office of Parks, Recreation & Historic Preservation, Historic Preservation Office
- New York State Historic Home Ownership Rehabilitation State Tax Credit

The Local Flood Hazard

Colleton County is a coastal county and the fifth largest (land size) county in the State. Over 40% of the county is in a **Special Flood Hazard Area (SFHA)**. Unfortunately, living along the coast has risks by way of flooding that are hazardous to property and life. The following major flood producing storms have affected Colleton County in the past 100 years: An unnamed storm in 1893 produced a tide of 17.0 to 19.5 feet above Mean Sea Level (MSL). The Hurricane of 1940 had a tide surge of 14.2 feet MSL. Hurricane Hazel in 1954 caused minimal damage. Hurricane Gracie in 1959 had a tide surge of 11.9 feet MSL, and Hurricane Hugo in 1989 caused minimal damage.

The chances of hurricanes and tropical storms are most prevalent from June 1 through November 30. August and September are the most active months for tropical storm activity. An approaching hurricane poses a potential danger or rising sea levels with wind driven waves and strong currents.

These facts along with the large range between high and low tides makes the southern coast particularly vulnerable to destructive flooding. With the rise and fall of the rivers, water levels are gravity-maintained via water control structures, or trunks. Occasionally heavy rains

Flood Warning System

Cable Channel 9 and radio station **WALI 93.7 FM** will broadcast emergency messages.

Should an evacuation be advised, local officials will notify you through radio, cable TV, and the Colleton County Operations Center, which will disseminate an evacuation notice door to door with bulletins denoting **“What To Do, When To Do It, and Where To Go.”** Evacuees will be directed to shelters by law enforcement at traffic control intersections. The local contact phone number is (843) 549-5632. Please call in reference to evacuation notices, procedures and shelters.

Flood Safety

If a hurricane warning is issued, citizens should be asked to evacuate. Before leaving, windows and doors should be locked and taped or boarded up. Turn off the electricity at the main breaker terminal and gas system at outside source - **only if you know how.** Be alert for gas leaks. Use a flashlight to inspect for damage. Do not smoke or use candles, lanterns, or open flames unless you know that the gas has been turned off and the area has been ventilated. Small appliances should be unplugged. Towels or rugs should be put around openings to reduce seepage. Lightweight or easily damaged items should be moved to the highest location possible, secured and covered with plastic. Be sure to secure outdoor furniture and potted plants.

Colleton County is subject to flooding from the Atlantic Ocean hurricanes, other severe storms and the Edisto River.

Dangerous chemicals, insecticides, herbicides or gasoline should be put in water tight containers and in a high spot. If you cannot take pets with you, put out food and water. Watch for animals, including snakes. Small animals that have been flooded out of their homes may seek shelter in yours.

Have an emergency kit packed with the following items: portable radio, flashlight, batteries, blankets, extra clothing, baby products, non-perishable food, manual can opener, medicines, toilet articles, important papers and valuables. Keep children away from flood waters, ditches, culverts and drains.

Watch out for dangling electrical wires and flooded low spots. Report downed power lines to the power company.

Substantial Improvements

Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement, over a five (5) year period, must conform to current building and flood regulations which might involve elevating the entire structure above the **Base Flood Elevation (BFE)**.

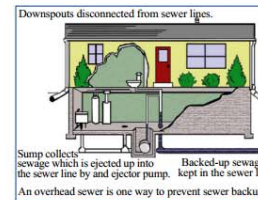
Property Protection Measures

Various alternatives are available to help minimize flooding. If the floor level of your property is lower than the **Base Flood Elevation (BFE)**, consider elevating your structure, if possible. Brochures discussing flood proofing and other mitigation measures are available at the Colleton County Public Library.

The Colleton County Planning and Development Department can provide you with a list of licensed contractors and consultants who are knowledgeable about flood proofing or retrofitting techniques and construction.

If a flood is imminent, some last minute emergency measures can always help. Property can be protected by sandbagging areas where water might enter living spaces. Valuables and furniture may be moved to higher areas of the dwelling to minimize damages. Attaching plywood or other approved protection systems over the windows and patio doors will help protect against high wind damages associated with hurricanes. Whatever emergency protection measures you use, it is always best to have a plan written in advance to make sure you don't forget anything after you hear the flood warning.

To increase the safety of your property and reduce insurance premiums, you should consider building to higher standards. Of course, the most effective and permanent means of protecting your structure is to locate it out of the floodplain. If you are unable to relocate your structure, the next most effective means is to elevate your structure above the base flood elevation.



Flood Insurance

The **National Flood Insurance Program (NFIP)** was created by Congress in 1968 to provide homeowners flood insurance at a reasonable cost. Since homeowners policies **do not** cover flooding, separate policies are available on almost any enclosed building and its contents including single family homes, condominiums, mobile homes on foundations and commercial buildings. Policies are written for one year. You do not have to live in the floodplain to qualify for flood insurance.

Flood insurance is required by law for federally financed loans when buying, building or improving structures, but you must act in advance. There is a thirty day waiting period on new policies. Check with your local insurance agent for specific rates and coverage.

Federal flood insurance is available in a **Coastal Barrier Resource System (CBRS)** area if the subject building was constructed (or permitted and under construction) before the CBRS area's effective date. Some coastal subdivisions on Edisto Island in Colleton County have CBRS areas identified.

The county's participation in the CBRS program includes the availability of **Certified Floodplain Managers (CFM)** in the Colleton County Planning and Development Department to answer questions about flooding, building requirements that are more stringent than federal minimum standards, regulations for stormwater management in new construction, publications in the Colleton County Memorial Library, and public outreach projects, such as this brochure.

Contact the **Colleton County Planning and Development** Department for more information. Phone (843) 549-1709

PI-2: Develop a Comprehensive Outreach Program

Project Description

One of the best ways to mitigate flood damage and loss is to be prepared. The development of a comprehensive information system will focus on educating the public about the hazards associated with extreme weather events and flooding, as well as provide the public access to resources designed to reduce their own exposure to flood damage and property loss.

Instead of waiting for residents to find out about localized flooding and its remedies for themselves, the Town can implement a series of community outreach projects designed to increase awareness among residents, businesses, and property owners about what to do during flood events and how to protect themselves and their property. These outreach projects also let people know what the Town is proactively doing to protect residents and property. The program should build awareness among Town residents regarding what to do during

a flood emergency, flood insurance, and loss-reduction measures.

Action Steps

- Seek funding to upgrade the County website to include flood prevention page that includes local information, flood map, flood insurance information, property protection measures, and/or educational materials; essentially ways to stimulate interest or convey ideas to Internet surfers.
- Provide emergency information (evacuation procedures, emergency contacts, flood map) on a door hanger.
- Go directly to churches, senior centers, and schools to work directly with residents on the Reverse 911 enrollment process.
- Include informational message from Mayor in year-end State of the Town report
- Hold community seminars at the library, churches, senior center and schools to

educate residents about what to do before, during and after a flood, and assist them in signing up to receive emergency alerts

- Coordinate with NYSEG to educate residents what to do during a flood event
- Establish a media campaign - TV, radio, backpack brigade, articles and ads in Penny Saver

Project Champion

- Save Tioga Center Committee

Potential Partners

- School and Churches
- Fire and Police Departments

Potential Resources

- NYS Department of State, Local Government Training

Structural Projects (SP)

Background

Structural projects keep flood waters away from an area or help efficiently move water while minimizing negative impacts on the surrounding lands. Structural projects are typically ‘engineered’ projects designed and undertaken by civil engineers, hydrologic engineers, and structural engineers. Typically, engineers involved in this field specialize in water resource engineering services including Dams, Floodplain Management and Stormwater Management.

While it is possible to mitigate and prevent impacts from future flood events using non-engineered (i.e., soft engineering) solutions such as natural stream bank restoration or creating mitigation areas throughout the watershed, it is sometimes necessary to develop and install an ‘engineered solution’ such as constructing berms or flood walls, or correctly sizing and replacing culverts. This LTCRS combines both the ‘soft engineering’ solutions to mitigation and prevention as well as the ‘hard engineering’ solutions focusing on berms, culverts, and stormwater system improvements.

The following recommendations relate to potential engineered solutions to prevent and mitigate impacts from future flooding.

Goal

Protect key areas and critical facilities during flood events.

Structural Projects

To accomplish this goal, the Tioga LTCRS Steering Committee indentified the following Structural Projects:

- SP-1: Evaluate the potential for a berm or floodwall along Pipe Creek.
- SP-2: Replace culvert in Smithboro under rail road tracks.
- SP-3: Replace/Repair Culvert in the west end of Tioga Center.
- SP-4: Prepare a Roadside Maintenance Plan and continue current practices
- SP-5: Repair Allyn Road Bridge.

SP-1: Evaluate the Potential for a Berm or Floodwall along Pipe Creek

Project Description

During extreme rain events, Pipe Creek from Allyn Road to NYS Rt. 17C runs its banks along the its west side. In fact, many of the homes in this area have gone through FEMA’s buy-out program and are no longer there.

It is recommended that a feasibility study of a berm or floodwall in this area to determine if it can be constructed and if it is, how it will impact other areas. It may also be necessary to identify possible mitigation areas as well. Any study of the berm will involve the Army Corp of Engineers. Before such a project can considered for funding it will be necessary to conduct a cost-benefit analysis to illustrate that the cost of the improvement is justified in who it is benefiting. The analysis must use the FEMA-approved methodology and software to demonstrate the cost-effectiveness of the project. FEMA has developed Benefit-Cost Analysis (BCA) software to facilitate the process of preparing a BCA.

As an alternative to increasing the height of the berm, the Town can stabilize the banks along the Owego Creek as recommended under Natural Resources section of this report.

Project Champion

- Town Board

Potential Partners

- Tioga County Soil and Water Conservation District

Project Resources

- NY Rising Community Reconstruction (NYRCR) Program
- New York Works Flood Mitigation and Flood Control Grants
- FEMA Public Assistance (PA) Grant Program
- FEMA Hazard Mitigation Grant Program
- Community Development Block Grant (CDBG) Disaster Recovery Assistance
- USDA Rural Development Rural Repair and Rehabilitation Loans and Grants

SP-2: Replace Culvert in Smithboro under Rail Road Tracks

Project Description

Where culverts are located to allow vehicular crossing of streams they can become pinch points for water during extreme rain events. They can become clogged with debris and reduce or obstruct a river or stream's ability to convey the high water to pass. This can cause a stream to top its banks, create a ponding condition above the stream banks, and flood the adjacent areas. This is especially true for double culverts (culverts that have a center pier.)

While the Town of Tioga has been very proactive in replacing culverts that were damaged as a result from Irene and Lee, there is one culvert in the hamlet of Smithboro that has not been replaced. During

extreme storm events, this culvert gets blocked with debris and the waters back up toward NYS Rt. 17c.

As the Town, with its own funding or with federal or state dollars, looks to replace this culvert, a hydrologic analysis should be undertaken to ensure that the culvert is sized correctly to handle the flow of water. If a new culvert is installed and is still undersized then it remain a pinch point and continue to disrupt the natural flow of water.

Project Champion

- Town Highway Department

Potential Partners

- Norfolk-Southern Railroad

Project Resources

- NY Rising Community Reconstruction (NYRCR) Program
- New York Works Flood Mitigation and Flood Control Grants
- FEMA Public Assistance (PA) Grant Program
- FEMA Hazard Mitigation Grant Program
- Community Development Block Grant (CDBG) Disaster Recovery Assistance



SP-3: Replace/Repair Culvert in the West End of Tioga Center

Project Description

Strategically placed culverts are an important element in helping maintain a stable velocity and the proper flow capacity for ditches along transportation corridors by timely outleting water from them. This will help alleviate transportation corridor flooding, reduce erosion, and thus reduce maintenance problems. In addition, strategically placed culverts help distribute runoff over a larger riparian filtering area.

The culvert is located in west end of Tioga Center, near the Susquehanna River on NY-17c. The culvert provides a critically important outlet for drainage waters during heavy rain events along the rail corridor in Smithboro. Failure of this culvert has the potential to not only be life-threatening but could also have a significant impact on the state economy as freight trains frequently pass over the culvert.

The Town should consider hiring an engineer to examine the culvert for signs of corrosion, joint separation, bottom sag, pipe blockage, piping, fill settling, cavitations of fill (sinkhole), sediment buildup within the culvert, effectiveness of the present inlet/outlet inverts, etc. The engineer should also check inlet and outlet channels for signs of scour, degradation, gradation, debris, channel blockage, diversion of flow, bank and other erosion, flooding, etc.

Project Champion

- Town Board

Potential Partners

- Norfolk/Southern Railroad
- Lopke Rock Products

Project Resources

- NYS Department of Transportation (DOT)
- US Forest Service, National Fish and Wildlife Foundation
- Federal Emergency Management Agency (FEMA)

SP-4: Prepare a Roadside Maintenance Plan and Continue Current Practices

Project Description

As roadside ditching takes place and care is not taken to re-seed or re-plant the ditch it often causes erosion and stormwater runoff to negatively effects adjacent water bodies by depositing silt and sand.

The Town of Tioga should undertake a study to evaluate the effectiveness of simple, low-cost, low-maintenance Best Management Practices (BMPs) designed to improve stormwater quality and/or flow control within existing roadside ditches. If effective, these BMPs could offer alternatives to traditional stormwater treatment practices such as retention/detention ponds and vaults.

The study should explore the use of ditch BMPs to promote storage, treatment and infiltration of stormwater within the existing ditch network. The BMPs should be designed to function within the constraints of road engineering and safety standards while incurring the lowest possible



Source: King County DOT

installation and maintenance costs. Ditch BMPs should be designed to provide stormwater treatment and/or flow control benefits for low to moderate intensity

precipitation events, while maintaining ditch capacity and allowing conveyance of peak winter flows to minimize the risk of localized flooding.

Project Champion

- Town Highway Department

Potential Partners

- Tioga County Soil and Water Conservation District
- Town Board

Project Resources

- Community Development Block Grants
- Environmental Facilities Corporation, Green Innovation Grant Program
- NYS Department of Transportation, Transportation Enhancement Program

SP-5: Repair Allyn Road Bridge

Project Description

A bridge spanning Pipe Creek located along Allyn Road, approximately one-tenth of a mile southwest of Halsey Valley Road, has been showing signs of deterioration as a result of flooding. The Town is responsible for maintaining the road surface and the County is responsible for maintaining the bridge. The bridge was built in 1987 and is owned by the County. 2008 average daily travel statistics indicate that about 340 vehicles cross the bridge on a daily basis, of which about 20 a day are trucks. Currently, the bridge is listed as not deficient and has an overall sufficiency rating of 73.6. However, some maintenance is required due to flooding damage. Also, the bridge is due for another inspection in 2013 as part of the regular 24-month inspection schedule. In 2011 a proposal was developed to widen the bridge with deck replacement. Total cost was estimated at about \$1.5 million.

The Town might consider participating in the Statewide Conference on Local Bridges. The conference is a collaboration between NYS DOT Structures Division and Cornell University Local Roads Program to present about bridge issues for local governments. The Conference is intended to actively foster partnerships between local agencies with bridge responsibility and the NYSDOT.

Project Champion

- County Highway Department

Potential Partners

- NYS DOT
- Cornell University

Project Resources

- NYS DOT: CHIPS and Marchiselli Program



Natural Resource Protection (NRP)

Background

The Natural Resource Protection recovery projects identified in this study include activities designed to restore natural areas or the natural function of floodplains, streams and watersheds within the Town of Tioga. Activities include best practices, stormwater control, erosion and sediment control and public education.

Goal

Preserve and restore natural areas including floodplains, streams and wetlands within the Town of Tioga.

Natural Resource Protection Recovery Projects

To accomplish this goal, the Steering Committee identified the following five Natural Resource Protection recovery projects:

- NRP-1: Conduct a Watershed Assessment and Geomorphological Analysis.
- NRP-2: Complete a Flood and Hazard Mitigation Analysis.
- NRP-3: Public Education and Outreach.
- NRP-4: Natural Resource Stabilization and Restoration
- NRP-5: Conduct a Stormwater Management Audit of Tioga Center.

NRP-1: Conduct a Watershed Assessment and Geomorphological Analysis

Project Description

The first stage of understanding the health and behavior of streams and tributaries is to conduct a Geomorphological Assessment. Geomorphology is the scientific study of landforms and the processes that shape them. Geomorphologists seek to understand why landscapes look the way they do, to understand landform history and dynamics, and to predict changes through a combination of field observations, physical experiments and numerical modeling.

This recommendation is to complete a morphological and survey assessment of the Wappasening Creek. The process combines engineering survey information with scientific data. The combined data set will be used to model how the streams will perform during certain rain events (i.e., 5, 10, 50, 100 and 500 year storms). This information will prove extremely useful in determining where and at what level of rain event (in inches) flooding will begin to occur. The Geomorphological Study should assess channel stability, sediment transport capabilities, the patterns and profiles of the streams, and other features that will be used to determine the overall condition of the streams.

The streams can then be classified using the Rosgen Classification System which will help predict how the Wappaseneing Creek will perform during high flow events. This information can be used as a baseline against future surveying and assessment. Completing this

assessment will help guide the Town in various ways including concentrating emergency warning systems and identifying potential mitigation measures higher up in the watershed to help alleviate rushes of water near the outflow to the Susquehanna during storm events. (See NPR-2)

Project Champion

- Town Board

Potential Partners

- Save Tioga Center Committee
- Tioga County Soil & Water Conservation District
- Trout Unlimited

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State, Office of Communities and Waterfronts
- NYS Department of Environmental Conservation, Water Quality Management Projects

NRP-2: Complete a Flood and Hazard Mitigation Analysis

Project Description

This project may be combined with the Watershed Assessment and Geomorphological Analysis Project described in NRP-1.

Using the information gathered during the Watershed Assessment and Geomorphological Analysis, a consultant can complete an analysis and assessment of possible flood mitigation alternatives. These mitigation alternatives should be modeled to show how they will reduce the impact of the flood during different sized storms. As part of this project, a cost benefit analysis should be completed to understand the viability of the mitigation measures. As part of this analysis, a series of recommendations can be developed regarding appropriate uses that may be developed within the floodplain areas. These recommendations should be detailed about the 100 year flood plain, 500 year flood plain, as well as looking at development standards within 100 and 200 linear feet of a perennial stream, and 100 linear feet of an intermittent stream. This plan should set the standard of what the Village will expect with any new development and could be incorporated into the municipalities' by-laws or zoning.

Project Champion

- Town Board

Potential Partners

- Save Tioga Center Committee
- Tioga County Soil & Water Conservation District
- Trout Unlimited

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State, Local Waterfront Revitalization Program
- FEMA Hazard Mitigation Assistance Programs
- Community Development Block Grant (CDBG) Disaster Recovery Assistance
- Community Development Block Grant (CDBG) Disaster Recovery Assistance

NRP-3: Public Education and Outreach

This strategy involves development of a local pilot program to educate and engage the local population about these the rivers, streams and wetlands around town and in their own backyards. These programs will benefit the community as a whole and help get them organized and working with large watershed groups. Getting the grass roots advocacy going will help keep this process moving forward engaging the entire community from the youngest to the oldest. Below are lists of events and programs that may be implemented to garner support while providing a sense of ownership of the beautiful natural resources within the municipality.

- River Days – Rafting Race/Paddle/Fishing
- River Walks – Led by the local community experts
- Public School Class on River Gauges (Sidney) – Install river gauges in locations throughout the watershed teaching the children about river flow patterns
- Environ-thon
- Adopt a River Program – Possibly using corporate sponsors and volunteers to help the communities walk the banks removing rubbish

Project Champion

- Save Tioga Center Committee

Potential Partners

- Tioga Central School District
- Tioga County Soil & Water Conservation District
- Ransom Park Committee
- Tioga County Water Quality Coordinating Committee
- NYS Environ-thon

Potential Resources

- The Hurricane Irene-Tropical Storm Lee Business Flood Recovery Grant Program
- New York State Rural Area Revitalization Projects
- New York Works Flood Mitigation and Flood Control Grants
- FEMA Public Assistance (PA) Grant Program
- FEMA Hazard Mitigation Grant Program
- Small Business Administration Disaster Assistance Loans for Homes & Personal Property



Source: Living Lands & Waters

NRP-4: Natural Resource Stabilization and Restoration

Project Description

Based on the fluvial geomorphic assessment completed in NRP-1, a plan will be developed that will guide the municipality in the restoration of the natural resources throughout the town. This project will take the information in the assessment and provide restoration construction drawings that will be used to restore the rivers, streams and wetlands within the Town boundaries. The project will target the areas for immediate restoration; as well the areas that are beginning to show signs of failure. The plans will promote natural channel design to ensure that the resource areas are restored with scientific backing that promotes sediment transport, stable vegetated banks, ecological diversity, and connection to the floodplain. A matrix will be developed identifying the project, its level of priority, permits needed and estimated cost.



Action Steps

- Develop a full Request for Proposals (RFP)
- Secure match funding sources
- Solicit qualifications and bids
- Select qualified consultant

Project Champion

- Town Board

Potential Partners

- Town Highway Department
- Save Tioga Center Committee
- Tioga County Soil & Water Conservation District
- Private Property Owners

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State, Local Waterfront Revitalization Program (LWRP)
- NYS Department of Environmental Conservation (DEC)
- FEMA Hazard Mitigation Assistance Programs
- Community Development Block Grant (CDBG) Disaster Recovery Assistance
- Community Development Block Grant (CDBG) Disaster Recovery Assistance

NRP-5: Conduct a Stormwater Management Audit of Tioga Center

Project Description

Developing a Comprehensive Stormwater Management Plan will provide the municipality with the mapping of the existing stormwater system. This base survey will then be used to analyze and model how the existing stormwater system is performing during different storm events. This model will highlight the areas of concern and a series of alternatives will be developed to help resolve some of the issues. The Stormwater Management Plan will also look at the Town system as a whole and see if there are some ways to reduce the impervious cover, slow the rate of runoff and promote infiltration using low-impact development design techniques. This plan should set the standard of what the municipality will expect with any new development and incorporate into the municipalities' by-laws or zoning.

Action Steps

- Develop a full Request for Proposals (RFP)
- Secure match funding sources
- Solicit qualifications and bids
- Select qualified consultant

Project Champion

- Town Board

Potential Partners

- Save Tioga Center Committee
- Tioga County Soil & Water Conservation District

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State, Office of Communities and Waterfronts
- NYS Department of Environmental Conservation, Water Quality Management Projects

Community Revitalization & Economic Development Projects

The Community Revitalization and Economic Development (CRED) projects identified in this strategy are designed to improve quality of life issues for Town residents through enhanced economic development, recreation opportunities and municipal services.

Community Revitalization & Economic Development Projects

- CRED-1: Assess for future growth along the 17c corridor.
- CRED-2: Explore municipal sewer usage with school in Tioga Center.
- CRED-3: Establish farmers cooperative for centralized services/food hub with railroad siting.
- CRED-4: Explore low cost energy alternative and/or natural gas .
- CRED-5: Work with U.S. Post Office to realign zip codes to include Tioga Center.
- CRED-6: Conduct an engineering study Lounsberry Bridge to Halsey Valley.
- CRED-7: Identify a permanent water source for the Tioga Fire District.
- CRED-8: Implement Ransom Park Plan and Increase recreation activities.



CRED-1: Assess Potential for Future Growth Along the 17c Corridor

Project Description

The goal of this recovery project is to identify and promote appropriate sites for new businesses, as well as relocating commercial structures that are currently located in flood prone areas.

During the public workshop, the community identified the need to assess the potential of future commercial growth (General Store, Cottage Industry) along the 17c Corridor from Tioga Center West to Smithboro and the Glen Mary Drive Area. Prospective sites should include vacant parcels, good transportation access, and access to utilities and services.

Action Steps

- Conduct a GEIS of the study area and prepare a development concept plan.
- Conduct a land use analysis to identify potential sites capable of supporting commercial uses along the Route 17c corridor



- Focus on in-fill sites to minimize the expense connecting to existing utilities, services and roadways.
- Consider establishing a long-term relocation program that would provide either funding or regulatory incentives to allow businesses currently located in a flood prone area to relocate to the 17c corridor.

Project Champion

- Planning Board

Potential Partners

- Tioga County Department of Planning and Economic Development
- Tioga County Chamber of Commerce
- Interchange property owners
- Town of Nichols

Potential Resources

- USDA Rural Development

CRED-2: Explore Municipal Sewer Usage with School in Tioga Center

Project Description

A lot of the septic systems in the Tioga Center are comprised of a tank and a dry well. During the flooding associated with Tropical Storm Lee, many of these simple systems failed resulting in discharge of untreated wastewater into the Town's groundwaters and surface waters.

In 2000, the Town undertook a *Needs Assessment Study for Water Supply and Wastewater Management* in areas of the Town where public water/sewerage may be feasible. The study recommended that a preliminary engineering study be conducted to determine whether a major public infrastructure project was in the best interest of the Town.

Since the time the study was conducted, the Tioga Central School District constructed a new bus garage and supporting municipal sewer. An opportunity exists for the Town to explore shared municipal sewer usage with the Tioga Central School District.

Project Champion

- Town Board

Potential Partners

- Tioga Central School District
- Tioga Center residents

Potential Resources

- Department of Agriculture's Rural Utilities Service (RUS)
- U.S. Department of Commerce, Economic Development Administration (EDA)
- Appalachian Regional Commission (ARC)

CRED-3: Establish Farmers Cooperative for Centralized Services/Food Hub with Railroad Siting

Project Description

Tropical Storm Lee damaged or destroyed much of the agricultural landscape of the Town of Tioga in 2011. In discussions regarding the future of agriculture in the Town, residents and farmers identified that they are interested in expanding their business efforts. Specifically, the community expressed interest in an inland intermodal agricultural facility, a farmers' cooperative for centralized services (food hub), increased farmers' markets, and/or a community supported agriculture (CSA) network. Collectively, these initiatives will enhance and strengthen the viability of agriculture in Tioga.

Inland Intermodal Agriculture Facility

Tioga Center is located along Norfolk-Southern's Southern Tier Line near milepost 242. Two freight stations currently exist approximately four miles in either direction along the rail line: Smithboro freight station to the west and Goodrich Settlement freight



station to the east. Tioga's primary economic driver is its agricultural operations. Rail is a highly efficient transport mode for moving large and heavy freight over long distances. Tioga's location

along the Southern Tier Line allows for the agriculture community to have an efficient link to markets throughout the country. This strategic location should be capitalized on by developing an Intermodal Agriculture Facility in an effort to connect the regional agricultural community with the nation. Siting of the proposed facility will require an extensive site selection process to determine the most appropriate location.

Food Hub

A food hub is established in a place where local food producers can aggregate their resources and share in costs, making food distribution less expensive, more efficient, and often more competitive in the commercial market. Essentially, food hubs allow farmers to join forces to reduce their costs. Food hubs come in many forms though, from processing raw foods into frozen or canned goods, or they can be as simple as establishing a place where farms bring fresh produce for storage or transport a to other markets; it all depends on the

to other markets; it all depends on the needs of the region's farms. Given the wide variety of food hubs that the farmers in Tioga County may move towards, it would be best to first conduct a feasibility study to determine specifics for the food hub. In October 2012, funding was allocated to the Southern Tier West Multi-County Food Hub to conduct such a study. Collaborating with their resources would be an excellent initial step.

Farmers' Markets

While there are a few farmers' markets in Tioga County, they all operate seasonally, often irregularly, and there are none within the Town of Tioga itself. The schedule of existing farmers' markets may allow farmers to move their product around the county throughout the week, but having a consistent schedule in one or two locations would make it easier for consumers. Success of the farmers' market will involve an extensive marketing program with fliers, pamphlets, and radio ads to ensure that

consumers are aware of schedules and locations.

Community Supported Agriculture (CSA)

A CSA network typically occurs when a farmer offers a certain number of "shares" to the public. Interested consumers may purchase a share (or membership/subscription) and in return receive a box of seasonal produce each week throughout the farming season. CSAs allow the farmer to receive payment early in the season. It is important to note though that there are many variations on the Community Supported Agriculture Network. Similar to food hubs, conducting a CSA feasibility study is highly recommended.

Agri-tourism

There is a growing industry surrounding routing tourism through agricultural heritage areas. Showcasing Tioga County farms to tourists may spark an interest in

the agricultural industry in New York State, perhaps prompting further interactions and business for the farmer. Consider the Bike Fresh Bike Local campaign in Pennsylvania as a model. <http://pasafarming.org/events/bike-fresh-bike-local>

Clearly each option for advancing agribusiness in the Town of Tioga has multiple variations. While the action steps below provide a general outline, and the potential information resources and partners may provide future program inspiration, it is important to note that a feasibility study should be conducted for each possibility. Further collaboration among farmers would also be required to ensure alliance moving forward with a particular path.

Action Steps

As mentioned above, each option for advancing agribusiness is a multiple-step process with multiple variations. The process outlined below sets a general direction for collaborating with existing agribusiness knowledge bases to eventually expand agribusiness within the Town of Tioga.

- Expand any existing partnership with Tioga County REAP and the Cornell Cooperative Extension of Tioga County. These organizations already are invested in expanding agribusiness in Tioga County.
- Begin communications with the Southern Tier West Multi-County Food Hub in an effort to develop a partnership that could help to strengthen their operations. Given Southern Tier West's proximity and funding, this start-up food hub represents an excellent opportunity for the Town of Tioga to observe and learn from.
- Extensively research the Charlottesville, Virginia Food Hub. Determine which strategies would be appropriate for the Town of Tioga. Begin communications with the Hudson Valley Agribusiness Development Corporation, Hudson Valley Bounty, and Regional Access to gather lessons learned from operating a food hub in New York State.
- Seek funding for the Town of Tioga agribusiness feasibility study (see Potential Resources section).
- Pending chosen agribusiness action plan, potentially work with the University of Scranton Small Business Development Center, Agribusiness and Food Specialty Centers, as well as Buy Fresh Buy Local Northeast Pennsylvania for assistance in agribusiness marketing in the Town of Tioga.
- Coordinate with local university or community college to host heavily-advertised local food panel focusing on renewed interest in farming, the ecological impact of farming, the business side of farming, as well as nutrition and strengthening local food networks. This will be the first step in engaging the public in a renewed agribusiness effort in the Town of Tioga.
- Expand Town of Tioga agribusiness marketing.
 - If the feasibility study identifies a CSA as a viable strategy, register the Town of Tioga CSA on the New York State CSA directory and the New York Farm Bureau farmers' market guide page.
 - Extensively advertise restaurants serving farm-to-table cuisine.
 - Communicate with the New York Farm Bureau regarding establishing a regional office serving Tioga County.

-
- Seek a female farmer (or group of female farmers) to occupy the empty Tioga Seat of New York Agriwomen for further networking opportunities.

Community Models

- *Hudson Valley Agribusiness Development Corporation (HVADC):* The HVADC is the only economic development agency in the Hudson Valley with a specific focus on the viability of the agricultural economy in the region. They consider themselves a “business incubator without walls”.
- *Hudson Valley Bounty:* Hudson Valley Bounty’s mission is to educate the Hudson Valley Community about the preservation of local farms through the purchase and use of local and regional sustainable foods and products. They also promote and support networking connections between local agricultural producers and culinary businesses.
- *Regional Access (Ithaca, New York):* Regional Access was built on a vision of providing ecologically responsible, locally grown food throughout Upstate New York. They have since created a sustainable state-wide distribution system for specialty and natural foods. Regional Access’ customers include restaurants, natural food stores, co-ops, buying clubs, colleges, grocery stores, and local wineries.

- *Charlottesville, Virginia Local Food Hub:* The Local Food Hub is a nonprofit organization working to improve small farm viability and increase community access to local food. They believe that small, family farms should be able to sell their produce to large, wholesale markets – and that hospitals, restaurants, public schools, senior centers, and grocery stores should be able to offer fresh, local food to their customers and clients. The nonprofit also operates a Grower Services program, working directly with their partner producers to provide the technical assistance and guidance needed to successfully navigate the wholesale marketplace.



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- *Incubator Farm Pop-Up Markets:* With the average age of farmers in the U.S. at 57, the Charlottesville Local Food Hub believes that it is imperative to encourage and support a new generation of food producers. They have developed an Incubator Program where beginning farmers gain access to affordable land for a one-year lease, the use of farm equipment and infrastructure, and on-site training and mentorship from established farmers.
 - *University of Scranton Small Business Development Center, Agribusiness and Food Specialty Centers:* Offers one-on-one consulting specific to farm-based businesses, including marketing plan development, loan packaging, and linking to potential capital acquisition entities. Although located in Pennsylvania, the Center has extensive experience that may be utilized in partnering efforts.
 - *Buy Fresh Buy Local Northeast Pennsylvania:* The Buy Fresh Buy Local Pennsylvania Campaign focuses on locating farm fresh foods throughout the state. The Campaign publishes a Local Food Guide that identifies farmers markets, cooking classes, retail markets, restaurants and bakeries, and creameries.

Project Champion

- Town Board

Potential Partners

- Tioga County Agricultural and Farmland Protection Board
- Tioga County REAP (Rural Economic Area Partnership)
- Tioga County Economic Development and Planning
- Southern Tier East Regional Planning and Development Board

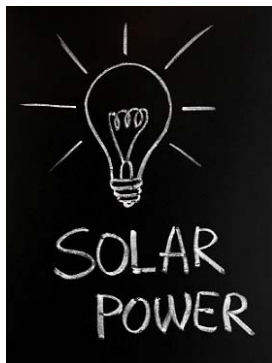
Potential Resources

- New York Farm Bureau
- New York State Department of Agriculture and Markets
- New York Farm Viability Institute
- Pride of New York
- New York Agriwomen
- The Empire State Food and Agricultural Leadership Institute
- Cornell Community and Regional Development Institute (CaRDI)
- Cornell Cooperative Extension Tioga County
- Southern Tier West Multi-County Food Hub
- Center for Agricultural Development and Entrepreneurship (CADE)

CRED-4: Explore Low Cost Energy Alternative and/or Natural Gas

Project Description

During the planning process, Tioga residents, including the farming community, expressed an interest in exploring low cost energy alternatives. While alternatives may not be able to provide 100% of the power needed, utilizing solar, wind, biomass, and/or natural gas will help to reduce the costs of operations over the long-term. Transitioning in these lower cost energy alternatives will result in savings to the business owners, residents and municipal government heating costs, hot water, operating school buses, and agricultural production.



Solar

Solar power is the process of converting sunlight into electricity, either using photovoltaics (PV), or indirectly using concentrated solar power (CSP). Photovoltaics convert light into electric current using the photoelectric effect. Growing steadily over the last decade, future solar power is predicted to be even more straightforward and easy to assemble in the future. While there are a number of obstacles to overcome in order to use solar energy, Tioga can be a leader in developing a community solar network. Local resources include the NY Solar Energy Industries Association and the New York State Energy Research and Development Authority (NYSERDA).

Wind

Wind power is the process of converting wind energy into a useful form of energy, such as utilizing wind turbines to make electrical power. Large wind farms consist of hundreds of individual wind turbines

connected to the electrical power transmission network. Utility companies increasingly buy surplus energy produced by small domestic wind turbines. A local resource is the Southern Tier Central Regional Planning & Development Board (STC), which provided a wind energy local government support program through 2009.



The STC's purpose was to assist local officials through outreach, education, and technical assistance. Other resources include the U.S. Department of Energy: New York Wind Map and Resource Potential, and the NYSERDA Wind Energy Tool Kit.

Biomass

Biomass resources are renewable, biological materials, such as wood, waste, gas, or alcohol fuels. Energy can also come from living biomass or plant life that generates electricity while it remains alive, though most biomass energy is harnessed through direct incineration. The most popular plants grown for industrial biomass use are switchgrass, hemp, corn, poplar, willow, sorghum, and sugarcane.

Digesters

Methane digesters extract methane, the active ingredient in natural gas, from manure. The methane gas is then run through a generator, producing electricity, which can be sold to utilities. A solids separator can also be utilized which takes the solid remains and separates them into solid and liquid components. The liquid is a nutrient-rich fertilizer (stripped of odor) that can be used on fields. The solid is a dry (odor-free) substance that can be used as bedding for the animals, or as garden fertilizer. Due to the substantial investment

required, energy-producing methane digesters have been mostly limited to larger-scale farms.

Natural Gas

Recent advances in horizontal drilling and hydraulic fracturing have allowed deep gas reserves, such as the Marcellus Shale, to potentially be economically feasible to develop. A local resource on the viability of drilling for natural gas is TING (Tioga Investigates Natural Gas), formed to help the County prepare for and assess the potential public impacts and opportunities related to natural gas drilling. Additional resources includes the Cornell Cooperative Extension, Natural Gas Resource Center.

Action Steps

- Interested farmers to partner with an agency listed for a feasibility study, determining which alternative energy would be most appropriate for their operation.

- Once an alternative energy is deemed feasible, farmer and partner to perform preliminary cost analysis.
- Farmer and partner to determine required initial investment.
- Farmer and partner to seek funding; see potential resources and partners listed below.
- Form “local alternative energy for agriculture resource group”, to assist additional farmers in securing alternative energy funding in the future.

Project Champion

- Town Board

Potential Partners

- Save Tioga Center Committee
- Town Planning Board
- Tioga County Industrial Development Agency (TCIDA)
- Farm Bureau
- Farming Community

Potential Resources

- Southern Tier Regional Economic Development Council Rural Initiative Program
- NYSERDA's Agriculture Energy Efficiency Program
- ReCharge NY Power Program
- National Grid AgriBusiness Productivity Program
- National Grid Renewable Energy and Economic Development Program
- USDA Renewable Energy and Energy Efficiency Program
- USDA Rural Development Renewable Energy Systems and Energy Efficiency Improvements Grant Program

CRED-5: Work with U.S. Post Office to Realign Zip Codes

Project Description

As a result of Tropical Storm Lee, the Tioga Town Center U.S. Post Office, located on Route 17c, was forced to close. The flood waters associated with the storm left 8 feet of standing water in the building.

Immediately following the flood, Tioga residents had to travel to Owego to pick up their mail. Shortly there after, a temporary post office was established in the Court Room at the Tioga Town Hall. While this location was more convenient than traveling to Owego, mail was “unsecured” and left out in the open.

Today, residents with post office boxes must travel to the Village of Nichols to pick up their mail. Those that wish to have home delivery, have had to change their mailing address to read “Barton” NY.

During a Steering Committee meeting, residents stated that the loss of the U.S. Post Office in Tioga Center was not only inconvenient, but it made them feel as if

“they didn’t exist.” In the past, the 13845 zip code had a postal address that read “Tioga Center.” Today, it reads “Barton.”



Former Tioga Center Post Office

To assist Tioga Center in maintaining its identity and make it easier for businesses and tourists to find the community, it is recommended that the Town petition the U.S. Post Office to reestablish a Post Office in Tioga and rename the 13845 zip code to read “Tioga Center.”

Project Champion

- Town Board

Potential Partners

- Save Tioga Center Committee
- U.S. Postal Service
- Town residents

CRED-6: Conduct an Engineering Study to Build a Bridge from Lounsberry to Halsey Valley Road

Project Description

Halsey Valley Road provides an important north-south connection between Tioga Center and Route 96. The southern portion of the road terminates at State Route 17c near the west side of the Susquehanna River. The Southern Tier expressway is located on the east side of the Susquehanna River, with interchange 63 at Stanton Hill Road. A bridge connecting Halsey Valley Road with the east side of the Susquehanna River in Lounsberry at East River Road would provide residents of Tioga Center with a convenient connection to the Southern Tier Expressway. Further, this bridge would provide residents of Lounsberry with a more direct connection to Route 96 and other destinations on the west side of the Susquehanna River. Accordingly, this increased movement of vehicles between the two areas would strengthen economic development opportunities for small business in Tioga Center.

Project Champion

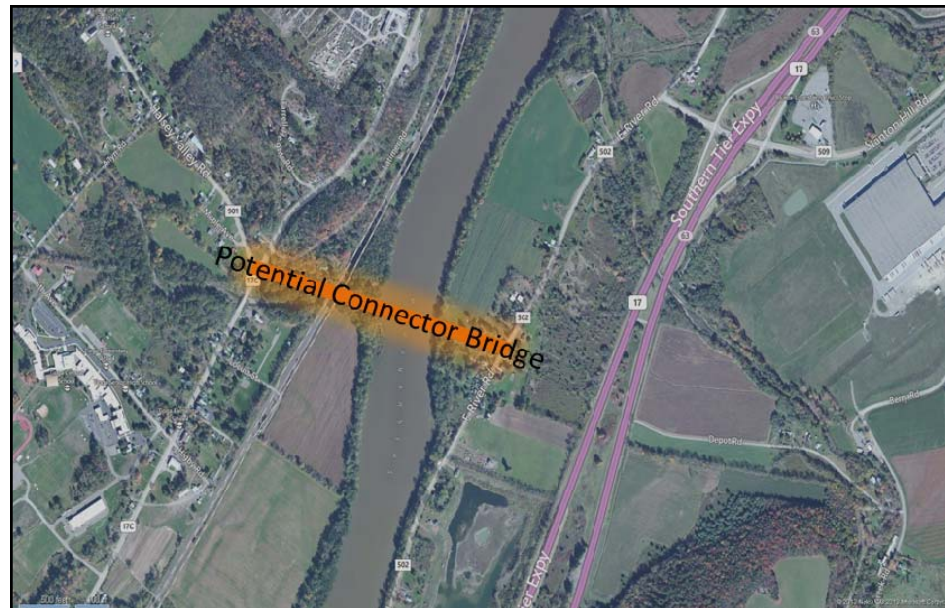
- Tioga and Nichols Town Boards

Potential Partners

- Tioga County Department of Public Works
- Norfolk-Southern Rail Road
- NYS Department of Transportation (DOT)

Potential Resources

- NYS Department of Transportation (DOT)
- Municipal budgets



CRED-7: Identify a Permanent Water Source for the Tioga Fire District

Project Description

The Tioga Center Volunteer Fire Department covers a rural area of approximately 58 square miles. The Department has a need to increase its water supply ability while reducing the time it takes to get water to a fire. The availability of an adequate and reliable water supply is paramount to effective fire suppression operations. The fire fighting water supply, whether from a municipal system, private system, or static source must be rapidly available, efficient, expandable, and uninterrupted to sustain long-duration fire suppression operations. A water supply system that falls short of these requirements will likely contribute to greater property loss and may contribute to the number and severity of fire-related casualties.

The Town has several options that should be evaluated to determine the most efficient and cost effective manner to establish a reliable water supply for fire fighting purposes within the fire district. It is recommended that the Town of Tioga conduct an engineering study to find a permanent water source(s) for the Tioga Center Fire District. Flowing capacity should be able to meet the minimum standards as required in *NFPA Standard 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting*.

Project Champion

- Tioga Fire District

Potential Partners

- Town Board
- Planning Board

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYDEC Volunteer Fire Assistance Grant Program
- FEMA, Assistance to Firefighters Grant
- USDA, Rural Public Safety Agency Grant and Loan Program



CRED-8: Implement Ransom Park Plan and Increase Activities

Project Description

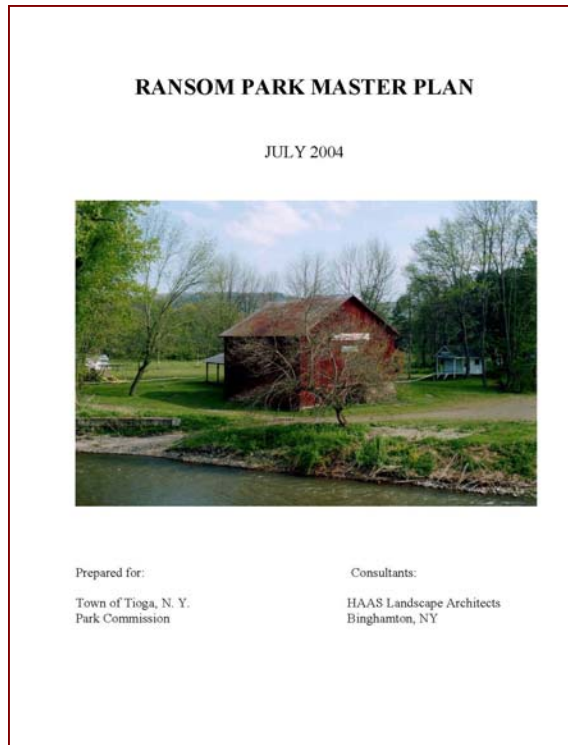
In 2004, a Master Plan for Ransom Park was conducted to establish design goals and implementation strategies for the 9.58 acre community park located along State Route 17c.

This recovery project recommends that the strategies identified in the Plan be implemented, including development of a pole type pavilion constructed on a concrete pad.

It is also recommended that the Town partner with existing park users, including the school district, service organizations, the Fire Department and the Pumpkin Festival Committee to increase activities in the park.

Project Champion

- Town Board



Potential Partners

- Tioga Central School District
- Tioga-Nichols Boy Scouts
- Tioga Girl Scouts
- Tioga Center Pumpkin Festival
- Tioga Center Fire Department
- Save Tioga Center Committee

Potential Resources

- NYS Office of Parks, Recreation and Historic Preservation (OPRHP)
- NYS Department of Environmental Conservation (DEC)
- NYS Department of State, Local Waterfront Revitalization Program (LWRP)

Regional Recovery Projects



The majestic Susquehanna River is one of the longest rivers in the east coast. The river flows for 464 miles through three states, starting in Upstate New York (Cooperstown), and then proceeding west through the Southern Tier, across the rural heartland of southeastern Pennsylvania, and finally meeting its terminus in the Chesapeake Bay in Maryland. Since record keeping began nearly 200 years ago, flooding has been reported along the main stem of the Susquehanna River every 15 years, on average. This fact, coupled with the localized flash flooding that occurs annually on smaller tributaries, has led to the Susquehanna River Basin being identified as one of the most flood-prone watersheds in the country.

There are over 1,400 municipalities located within the tri-state Susquehanna River Basin. What one community does with respect to flood control directly impacts neighboring communities, as well as those communities located downriver. For the purpose of this study, the Region includes the flood impacted river communities located in Tioga County.

During the planning process, each of the Tioga County communities participating in the LTCRS program stated that when it came to flood mitigation and recovery, it was important to not only think of how these long term recovery strategies would impact their own community, but there needed to be a regional approach to flood control included as well.

The following section identifies the Regional Recovery Projects intended to benefit the flood-prone River communities located in Tioga County.

Goals

- Ensure long term sustainability of the flood recovery program.
- Ensure that flood-impacted communities have the necessary capacity to apply for/administer flood mitigation and community revitalization funds.

Regional Recovery Projects

The following section identifies six Regional Recovery Projects intended to benefit the flood-prone River communities located in Tioga County.

- RR-1: Maintain the LTCRS Executive Committee.
- RR-2: Establish a Regional Flood Recovery and Revitalization Office.
- RR-3: Conduct a regional study of the Susquehanna River Corridor.
- RR-4: Establish an environmentally sensitive maintenance of streams program for flood impacted river communities.
- RR-5: Create a shared engineer position.
- RR-6: Create a micro enterprise loan Program.

RR-1: Maintain LTCRS Executive Committee

Project Description

As part of the Long Term Community Recovery Strategy (LTCRS) planning process, an Executive Committee comprised of representatives from the Village of Owego, the Towns of Tioga and Nichols, the Tioga County Department of Planning and Economic Development, and the NYS Department of State was established.

This Regional Recovery strategy proposes keeping the existing Executive Committee intact to oversee implementation of the recovery strategies identified in the LTCRS. This Committee will work in close partnership with the newly created Tioga Communities Reconstruction Committee.

Project Champion

- LTCRS Executive Committee



Potential Partners

- Municipal Officials from the Towns of Tioga and Nichols and the Village of Owego
- Tioga County Planning and Economic Development
- Tioga County Legislature
- Tioga County Emergency Management Office (TCMO)

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State: Local Government Training Program
- NYS Department of Labor: NY Works—Neighborhood Rebuilding Corps
- US HUD Community Development Block Grant (CDBG) Program
- Appalachia Regional Commission (ARC)

RR-2: Establish a Regional Flood Recovery and Revitalization Office

Project Description

At the project kick-off meeting, the LTCRS Executive Steering Committee identified the lack of staff/municipal capacity to obtain and administer flood-related grants as one of the highest concerns for the communities located in the Tioga County river region. The Town of Tioga does not have a Planner or Grant Writer on staff, and relies on technical assistance provided by the Tioga County Department of Economic Development and Planning and the Soil and Water Conservation Department.

This project seeks to establish a Flood Recovery and Revitalization Office with one or more shared program administrator positions within Tioga County. These positions will provide the municipal capacity needed to administer long term recovery programs for communities like the Town of Tioga, who would benefit from the increased community capacity that a Flood Recovery and Revitalization Office will provide. These program administrators should possess both technical and leadership skills, and will be responsible for:

- Working with the LTCRS Executive Committee and the NYRCR Committee to advance the Recovery Projects identified in this plan.
- Providing grant writing assistance to communities in Tioga County's River Region.

The office could be housed in Tioga County, Tioga Opportunities or the Upper Susquehanna Coalition.

Action Steps

- Apply for funding through available sources such as the NYS Consolidated Funding Application (CFA) process or NY Rising Community Reconstruction Program
- Positions would be funded utilizing grant monies for years 1-3
- After year 3, funding for the positions would be financed by the flood impacted River communities



Project Champion

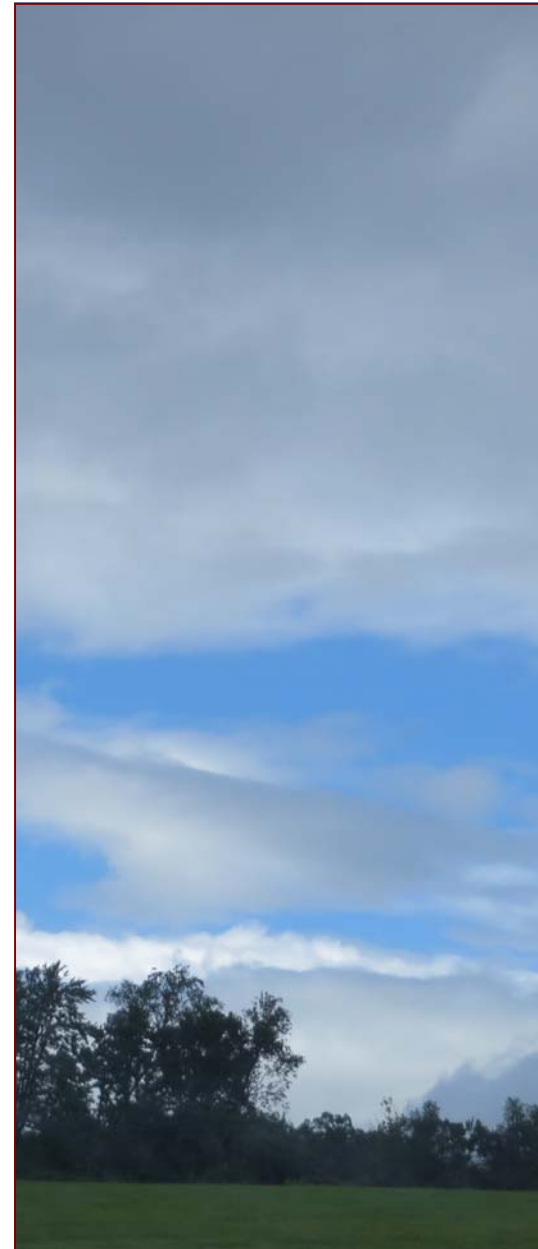
- Tioga County Legislature
- Tioga Opportunities, Inc.
- Upper Susquehanna Coalition

Potential Partners

- Tioga County Economic Development & Planning Agency
- Town and Village Boards
- LTCRS Executive Committee

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State: Local Government Training Program
- NYS Department of Labor: NY Works—Neighborhood Rebuilding Corps
- NYS Division of Housing & Community Renewal
- US HUD Community Development Block Grant (CDBG) Program
- Appalachian Regional Commission (ARC)



RR-3: Conduct a Regional Study of the Susquehanna River Corridor

Project Description

This study will look at the regional flooding issues and existing ecology related to the Susquehanna River. It is important to understand how the river reacts during different flooding events based on the amount of rain, where in the watershed the rain is deposited, the intensity of the given storm. All this information will be modeled to show the areas that will be flooded during a given storm event. At a minimum this model should be studied as the river enters Tioga County, but incorporating more counties upstream will help to better understand what impacts the upper watershed is having on the river as it enters Tioga County. This model will highlight where there may be existing pinch points (i.e. undersized culverts and bridges, elevated roads that may be creating a dam situation, etc.) within the watershed that are not draining properly as well as help understand how long the it will take for floodwaters to rise.

Understanding the ecology of the river will help with determine overall water quality issues related to Susquehanna River. Looking at vegetation patterns, sediment transport (erosion issues), habitat types be used by the animals in the region, and other ecological features will provide the base line information needed to understand the dynamics of this living system. The information gathered will be used to support possible mitigation measures related to flooding and water quality.

This model will then be used to locate what possible mitigation measures should explored and modeled to reduce the flooding and ecological impacts during a given storm event. These mitigation measure include creating wetlands, reducing impervious cover, reconnecting streams with floodplains, green infrastructure practices promoting infiltration and storage, and minimizing encroachment on the tributaries.

Project Champions

- LTCRS Executive Committee
- Tioga Communities NY Rising Community Reconstruction (NYRCR) Committee

Potential Partners

- Municipal Officials
- Tioga County Planning and Economic Development

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State: Brownfield Opportunity Areas (BOA) Program
- NYS Department of State: Local Waterfront Revitalization Program (LWRP)
- NYS Division of Housing & Community Renewal
- US HUD Community Development Block Grant (CDBG) Program
- Appalachia Regional Commission (ARC)
- US Army Corps of Engineers
- National Parks Service: Land & Water Conservation Fund

RR-4: Establish an Environmentally Sensitive Maintenance of Streams Program for Flood Impacted River Communities

Project Description

One of the universal issues identified during the public participation process was the flood related damage caused by debris (sediment, gravel, trees, and branches) “clogging” the streams and creeks in the County.

The Tioga County Soil & Water Conservation District (SWCD) supports the development of an environmentally sensitive maintenance of streams program. This would entail the District working with municipalities, including municipal officials and highway department staff, to ensure scientifically sound maintenance approaches are taken in streams that will not cause further degradation of the existing streambed and worsen conditions. The program would include the following elements:

- Training by SWCD of municipal highway department staff in environmentally sensitive maintenance of stream techniques.
- Municipal officials identifying locations of maintenance and working with SWCD to identify the best approach.
- SWCD obtaining permits for the work to be conducted.

This approach would include identification of stream debris jams (ie. log jams and gravel deposits) that will cause impact to infrastructure during future flooding events or those causing significant changes in stream dynamics. Other areas to be focused on would be the removal of gravel in order to open clogged channels and restore

flow, channel realignment, and streambank stabilization to prevent future erosion. All of these sites will be evaluated by SWCD on a case-by-case basis.

Benefits of this program will include improved coordination and cooperation between municipal staff and the SWCD, as well as expediting the permitting process with regulating agencies as municipal departments show their growing knowledge of stream function and processes, while conducting environmentally sensitive maintenance on streams.

Project Champion

- Tioga County Soil and Water Conservation District

Potential Partners

- Town Boards for Tioga and Nichols
- Village of Owego Board
- Tioga County Department of Public Works

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State: Brownfield Opportunity Areas (BOA) Program
- NYS Department of State: Local Waterfront Revitalization Program (LWRP)
- NYS Department of Environmental Conservation: Water Quality Improvement Project Program
- NYS Office of Emergency Management: Hazard Mitigation Planning Grants (HMGP)
- Federal Emergency Management Administration (FEMA)
- US Army Corps of Engineers
- Natural Resources Conservation Service, Wildlife Habitat Incentive Program



RR-5: Create a Shared Engineer Position

Project Description

The LTCRS Steering Committee identified that there is a need for municipal engineering services within Tioga County. While the Tioga County Soil & Water Conservation District provides technical assistance regarding natural disaster concerns, there is still a need for an engineer or contract engineer to provide technical assistance to the flood impacted communities throughout the County.

This project seeks to establish either a part-time shared engineer or contract engineer position within Tioga County. While the position would be housed within the Tioga County Soil & Water Conservation District, it could be filled by a part-time employee, or an agreement with a consulting firm to provide a specified number of hours per week.

The Tioga County Shared Engineer would be responsible for:

- Conducting an inventory of existing infrastructure within specific communities, evaluating its effectiveness against current and future weather events, establishing requirements for infrastructure upgrades, and recommending upgrades to officials.
- Interfacing with state, regional, and federal agencies regarding required infrastructure upgrades pre- and post-weather events.
- Writing specifications and reviewing contractor proposals for infrastructure upgrades.
- Utilizing professional engineer (PE) stamp to review contractor shop drawings for infrastructure upgrades.
- As long-term community recovery projects are developed, analyzing any suggested infrastructure upgrades against potential weather events of the future.
- Examine county and regional engineering issues and trends; research and interpret laws, regulations, and general information; identify policy, procedural, and compliance issues, and recommend solutions.
- Should the County Soil & Water Conservation District require assistance, review land development proposals, and recommend infrastructure, and water and wastewater system requirements.
- Assure that activities are in compliance with all laws, policies, regulations, timelines and goals.

Action Steps

- Develop a specific job description for the shared engineer position.
- Determine the role of the engineer in terms of current and proposed recovery projects.
- Outline a work program and the expected percentage of time to be spent on each major project.
- Seek outside funding to support the position for a determined initial period.
- Once the necessary funding has been obtained, seek and hire part-time shared engineer.

Project Champion

- LTCRS Executive Committee

Potential Partners

- Tioga County Soil & Water Conservation District
- Tioga County Department of Planning and Economic Development

Potential Resources

- NY Rising Community Reconstruction (NYRCR) Program
- NYS Department of State: Local Government Services Program
- U.S. Department of Commerce Economic Development Administration (EDA)
- U.S. Department of Agriculture (USDA) Rural Development
- U.S. Department of Housing and Urban Development Community Development Block Grant (CDBG) program

RR-6: Create a Micro Enterprise Loan Program

Project Description

In addition to damage to many homes and neighborhoods throughout Tioga County there was flood damage to private businesses. Whether in downtown Owego or in the Town of Nichols, many different types of businesses were affected. During recovery there were programs established to restore homes and/or buy-out homes using FEMA dollars as well as other funding sources such as the HMPG program. However, there is not a similar source of funding available to private businesses to rebuild. This recommendation seeks to establish a micro enterprise loan program to provide assistance to private businesses in the flood affected areas.

Working with NYS Empire State Development, a Micro Enterprise loan program could be established. The proposed Micro-Enterprise Loan Program would be available to assist small businesses and start-up companies in Tioga County to repair property damage including buildings and grounds that were severely affected by Hurricane Irene and Tropical Storm Lee. If the original loan pool is capitalized by New York State Small Cities Community Development Program, which is a typical approach, funding would be available to businesses that create new job opportunities for low and moderate income persons. Potentially administered by Tioga county Department of Planning and Economic Development or the Southern Tier East Regional Planning and Development Board, the program could be designed to

provide low interest loans and gap financing for small business start-ups with five or less employees. The loan administrator could work closely with the Binghamton University Small Business Development Center (SBDC), to help prospective applicants complete business plans and provide technical assistance that is needed to help small business.

Project Champion

- LTCRS Executive Committee

Potential Partners

- Tioga County Economic Development and Planning (new staff person)
- Southern Tier East Regional Planning and Development Board
- Binghamton University SBDC

Potential Resources

- NYS Empire State Development: Minority & Women-Owned Business Development & Lending Program
- NYS Empire State Development: Small Business Revolving Loan Fund
- NYS Small Cities Community Development Program
- NY Rising Community Reconstruction Program
- US HUD Community Development Block Grant (CDBG) Program
- Appalachian Regional Commission (ARC)
- US Department of Agriculture: Community Facilities Direct & Guaranteed Loan & Grant Program
- US Department of Agriculture, Rural Business-Cooperative Service: Rural Micro Entrepreneur Assistance Program
- Home Depot Foundation
- Lowe’s Charitable & Educational Foundation
- CITI Foundation





Implementation

The implementation plan outlined in the following table has been developed to support Tioga’s Long Term Community Recovery Strategy. The table organizes strategies by topic area. Each topic area is identified by the bold fill within the cells. Below the topic area heading are the strategies identified to advance each topic area, which are identified in the left hand column.

A Project Champion has been assigned to each action and potential partners and funding sources have also been identified.

Finally, the plan sets a level of priority for each strategy. These priorities include immediate, short-term, medium-term, long-term and ongoing.

This implementation plan will be amended and updated as new actions are introduced and as strategies are implemented.

At the most basic level, this LTCRS identifies critical steps that are needed to enhance the quality of life and improve the economic opportunities in the Town. The specific recommendations are provided as a guide to those who participate in the effort to implement the goals of the community. Achieving these goals will require the efforts of local government, federal and state funding, and the participation of volunteers throughout the community. No one single person or group will be able to achieve the goals independently. It will command the determination, strengths and diversity of many offices, agencies and volunteers working towards a common vision. This section of the LTCRS proposes an implementation strategy to coordinate these efforts incrementally for long-term success in Tioga and the region.

	Recommendation	Project Champion	Potential Partners/Funding	Immediate*	Medium-Term	Long-Term	Ongoing
Prevention Activities (PA)							
PA-1	Develop and adopt a site plan review ordinance for community development that connects with the Floodplain Damage Prevention local laws for commercial development along 17C	Town Board	Planning Board, Tioga County Planning		M		
PA-2	Encourage new reconstruction/redevelopment within 100-year floodplain to be built on piers	Town Board	Planning Board		M		
PA-3	Customize local laws to "flood proof" new or replacements homes	Town Board	Planning Board		L		
Property Protection (PP)							
PP-1	Continue participation in the HMGP program	Town Board	Save Tioga Center Committee, Tioga County Emergency Management Office				H
PP-2	Create a resource guide for building with flood damage resistant materials	Save Tioga Center Committee	Town Board, Federal Emergency Management Agency (FEMA)		M		
Emergency Services Measures (ESM)							
ESM-1	Conduct a gap analysis	Save Tioga Center Committee	Tioga County Emergency Management Office	H			
ESM-2	Integrating Citizen Action Group with Emergency Service Measures	Drew's Group	Save Tioga Center Committee, Community Care Network of Nichols		M		
Public Information (PI)							
PI-1	Create a flood safety awareness brochure	Save Tioga Center Committee	Town Board		H		
PI-2	Develop a Comprehensive Outreach Program	Save Tioga Center Committee	School, Churches, Fire and Police Departments		M		
Structural Projects (SP)							
SP-1	Evaluate the potential for a berm or floodwall along Pipe Creek	Town Board	Tioga County Soil and Water Conservation District, NYCR	H			

	Recommendation	Project Champion	Potential Partners/Funding	Immediate*	Medium-Term	Long-Term	Ongoing
SP-2	Replace culvert in Smithboro under railroad tracks	Highway Department	Norfolk/Southern Railroad	H			
SP-3	Replace/repair railroad culvert in the west end of Tioga Center	Town Board	Norfolk-Southern Railroad, Lopke	H			
SP-4	Prepare a Roadside Maintenance Plan and continue current practices	Highway Department	Tioga County Soil and Water Conservation District, Town Board		H		
SP-5	Repair Allyn Road Bridge	Highway Department	Tioga County DPW				
Natural Resource Protection (NRP)							
NRP-1	Conduct a Watershed Assessment and Geomorphological Analysis	Town Board	Trout Unlimited, Tioga County Soil and Water Conservation District, Save Tioga Center Committee	H			
NRP-2	Flood and Hazard Mitigation Analysis	Town Board	Trout Unlimited, Tioga County Soil and Water Conservation District, Save Tioga Center Committee	H			
NRP-3	Public Education and Outreach	Save Tioga Center Committee	School Board, Tioga County Water Quality Coordination Committee, Tioga County Soil and Water Conservation District, Ransom Park Committee				H
NRP-4	Natural Resource Stabilization and Restoration	Town Board	Highway Department, Save Tioga Center Committee, Soil and Water Conservation District, Private Property Owners		M		
NRP-5	Conduct a Storm Water Management Audit of Tioga Center	Town Board	Tioga County Soil and Water Conservation District, Save Tioga Center Committee			M	
Community Revitalization & Economic Development (CRED)							

	Recommendation	Project Champion	Potential Partners/Funding	Immediate*	Medium-Term	Long-Term	Ongoing
CRED-1	Assess Potential for Future Growth Along the 17c Corridor	Planning Board	Tioga County Economic Development and Planning, Tioga County Industrial Development Agency, Town Board, Town of Nichols, Save Tioga Center Committee, Interchange Property Owners		H		
CRED-2	Explore Municipal Sewer Usage with Tioga Center School	Town Board	Tioga Central School District, Tioga Center Residents, Planning Board, Save Tioga Center Committee		H		
CRED-3	Establish Farmers Cooperative for Centralized Services/Food Hub with Railroad Siting	Town Board	Cornell Cooperative Extension, Farm Bureau, Tioga County Agriculture and Farmland Protection Committee, Norfolk-Southern RR, Tioga County Industrial Development Agency, Tioga County Planning and Economic Development and Planning, Planning Board, Save Tioga Center Committee			M	
CRED-4	Explore Low Cost Energy Alternative and/or Natural Gas Service	Town Board	Save Tioga Center Committee, Planning Board, Tioga County Industrial Development Agency, Tioga County School, Farm Bureau, Farmers	H			
CRED-5	Work with U.S. Post Office to Realign Zip Code	Town Board	Save Tioga Center Committee, USPS, Residents	H			
CRED-6	Conduct an Engineering Study to Build a Bridge between Lounsberry and Halsey Valley Road	Tioga and Nichols Town Boards	Tioga County Department of Public Works, Norfolk-Southern Railroad, NYS DOT			M	
CRED-7	Identify a Permanent Water Source for Fire District	Tioga Fire District	Planning Board	H			
CRED-8	Implement Ransom Park Plan and Increase Activities	Town Board	Tioga Central School District, Girl Scouts, Boy Scouts, Pumpkin Festival Committee, Tioga Fire Department, Save Tioga Center Committee	M			

	Recommendation	Project Champion	Potential Partners/Funding	Immediate*	Medium-Term	Long-Term	Ongoing
Regional Recovery (RR)							
RR-1	Maintain LTCRS Executive Committee	LTCRS Executive Committee	Tioga County Economic Development and Planning, Towns, Villages, NYS Department of State, Tioga County Emergency Management Office, Tioga County Legislature	H			
RR-2	Establish a Regional Flood Recovery and Revitalization Office	Tioga County Legislature, Tioga Opportunities Inc., Upper Susquehanna Coalition	Town and Village Boards, LTCRS Executive Committee, Tioga County Economic Development and Planning	H			
RR-3	Conduct a Regional Study of the Susquehanna River Corridor	LTCRS Executive Committee, NY Rising Committee	Towns/Village, Broome County, Tioga County/Broome County Soil and Water Conservation Districts, Army Corps of Engineers, Southern Tier, Department of Environmental Conservation, SRBC, USC	H			
RR-4	Establish an Environmentally Sensitive Maintenance of Streams Program for Flood Impacted River Communities	Tioga County Soil and Water Conservation District	Town and Village Boards, Tioga County Department of Public Works	H			
RR-5	Create a Shared Engineer Position	Tioga County Soil and Water Conservation District	Town and Village Boards, LTCRS Executive Committee, Tioga County Department of Public Works	H			
RR-6	Create a Micro Enterprise Loan Program	LTCRS Executive Committee	Tioga County, Flood Recovery Office (proposed), NYCR, USDA, NYS Housing		H		