STEELE CREEK BASIN

MULTI-COMMUNITY FLOOD HAZARD MITIGATION PLAN

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SECTION 1 - INTRODUCTION

For many years the communities within the Steele Creek Basin have experienced repeated flooding that has resulted in damage to property, has caused a disruption of daily lives and commerce, and has threatened the safety of residents. In 1998 the US Army Corps of Engineers began a study to ascertain the feasibility of creating **structural** controls to help alleviate some of the impacts from fluvial and ice jam flooding in these communities.

During the late 1990's, the federal program guidance relating to structural flood control studies was enhanced to require an additional investigation of **non-structural** flood control alternatives as part of these studies. In conjunction with the US Army Corps of Engineers' effort, the Herkimer-Oneida Counties Comprehensive Planning Program (HOCCPP), in cooperation with the NYS Department of Environmental Conservation began to investigate non-structural alternatives for the Steele Creek Basin. In response to information needed for both the structural and non-structural alternatives investigations, the NYS Department Of Environmental Conservation and HOCCPP also developed an enhanced floodplain data management and mapping program that assists federal, state, regional county and local agencies with flood hazard mitigation activities.

This plan is somewhat unique in that it focuses flood hazard mitigation efforts based on the watershed boundaries of Steele Creek - not community boundaries. It is commonly recognized that flooding problems are generally watershed based, therefore mitigation plans that only consider flood risks at the municipal level may just be shifting problems to downstream communities.

Within the Steele Creek Basin, each of the key communities formally joined together (via the passage of respective municipal resolutions) to create a "Multi-Community Working Group" and to develop this basin-wide "Multi-Community Flood Hazard Mitigation Plan". Selected activities and the original membership of the "Multi-Community Working Group" are described further in Appendix A.

Through the efforts of the Multi-Community Working Group, the primary intent of this plan has been defined as the following:

1) to review and evaluate the risks and hazards of flooding in each community within the basin,

2) to educate residents of these hazards,

3) to encourage public participation in the effort, and

4) to develop non-structural activities and recommendations to alleviate flood-related impacts to the communities.

SECTION 2 - BACKGROUND

2.1 - The Basin and Its Communities

The Steele Creek Basin is approximately 17,509 acres in size. The downstream portion of the basin is primarily located within the Village of Ilion and the Town of German Flatts. The upstream portions of the watershed are located primarily within the Town of Columbia and Town of Litchfield in Herkimer County. Much smaller portions of the basin are located in the Towns of Winfield and Frankfort.

Table 1 illustrates the total acres that each respective municipality has within the Steele Creek Basin. The estimates were determined via Geographic Information System (GIS) data derived from Real Property information for parcel size, "clipped" to the 14-digit Hydrologic Unit Code (HUC) boundary for Steele Creek.

Table 1: *Land Area in the Steele Creek Basin*

Municipality	**Total Land Area in Basin** (acres)	**Percent of Basin Total**
Ilion (V)	647	4%
German Flatts	2715	16%
Columbia	6768	37%
Litchfield	6348	36%
Winfield (T)	965	6%
Frankfort (T)	66	<1%
TOTAL	**17,509**	**100%**

** Acres are rounded to the nearest whole number.*

The main stem of Steele Creek generally flows in a north/north-easterly direction – beginning in the Town of Winfield (near the Hamlet of Cedarville) and emptying into the Mohawk River (near the Village of Ilion). Steele Creek is approximately 9 miles in length. Most of the creek's primary tributaries originate on the eastern side of the basin within the Towns of Columbia and German Flatts.

The basin includes approximately 18 sub-watersheds that correspond to the areas that drain into each primary tributary of Steele Creek. Figure 1 - "Location Map" illustrates the Steele Creek basin and its sub-basins. This Figure also shows the primary tributaries, municipal boundaries, and the principle roads within the basin.

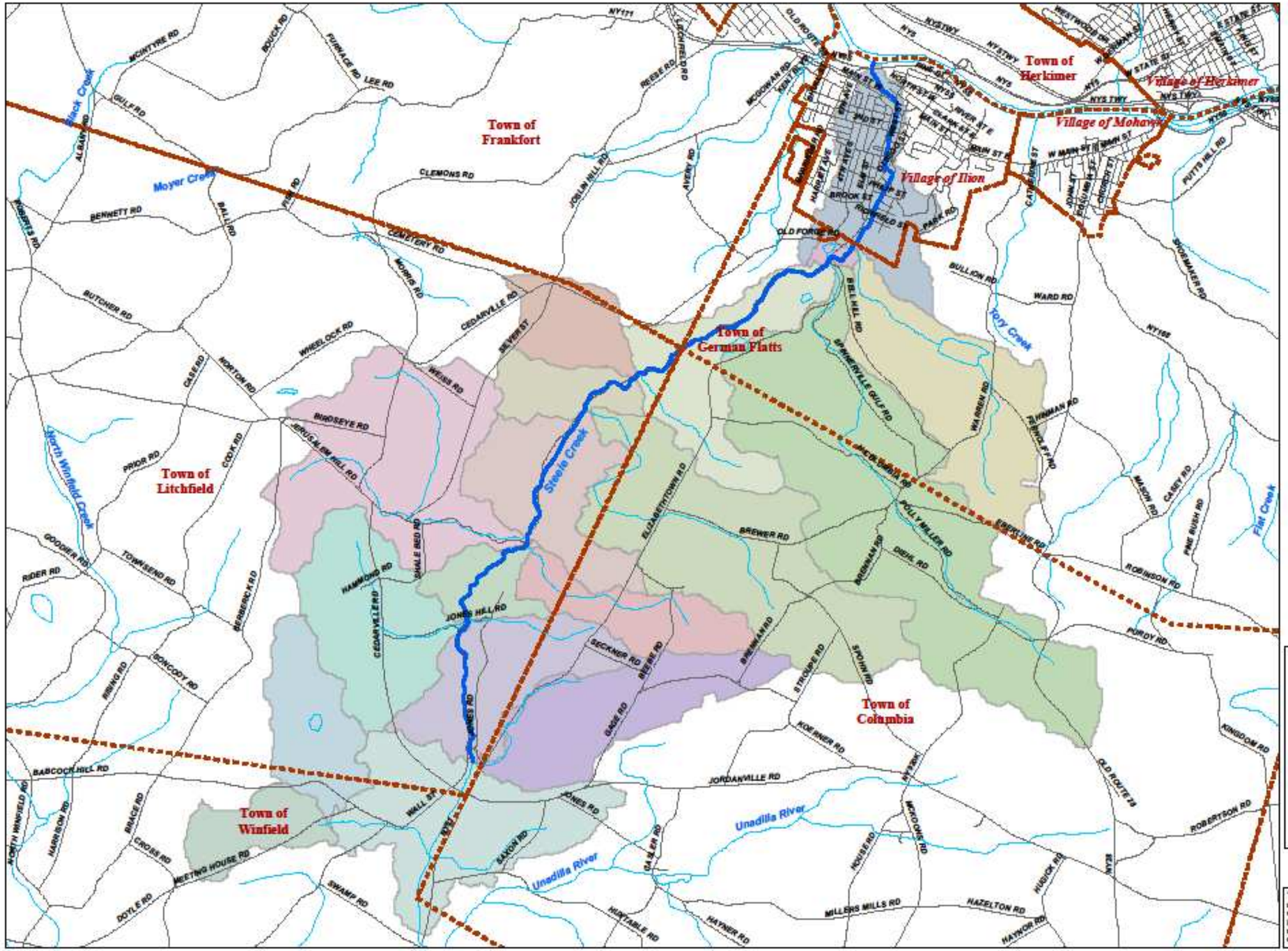
2.2 - Sources and History of Flooding

It should be stressed that the floods that impact the Steele Creek Basin are natural disasters that are highly dependent on weather conditions and will likely occur again and again over time. The Steele Creek Basin has historically experienced flooding events and has had major floods recorded as early as 1910. Many of the flooding events on Steele Creek are related to ice jamming conditions with the resultant back-up of water and overbank flooding. According to the Flood Insurance Study for the Village of Ilion (FEMA, 1999), "heavy rainfall, especially in the spring, combined with snowmelt, frequently causes high water and local flooding. Downstream ice jams, severe thunderstorms, and tropical storms have also caused flooding problems."

According to a US Army Corps of Engineers' report, "ice jam locations have historically been at the Main Street bridge ("River Mile" - RM 0.44), and the Otsego Street Bridge (RM 1.02). Due to the low right (east) overbank elevations (from Second Street to Main Street), once floodwaters exit the creek, they spread through much of the downtown area. Of particular concern is an electrical substation on the right bank (east bank) downstream of the

Figure 1 - Location Map

Steele Basin and Sub-basins



Legend

- Steele Creek
- Rivers, Streams, Creeks
- Municipal Boundaries
- Roads

Main Street Bridge. From the Main Street Bridge upstream to the Otsego Street Bridge, the channel is highly confined with trees, concrete walls, and houses extending right up to the channel banks on both sides. Immediately upstream of the Otsego Street Bridge, the channel takes a right angle bend with an ogee crest weir just upstream. The channel slope is milder upstream of the weir and slightly perched above the surrounding floodplain. Both freeze-up (frazil) and breakup jams are known to occur in this reach, flooding both sides of the river."

A history of flooding events and activities associated with flooding on Steele Creek is summarized in Appendix B.

Average summer flows on Steele Creek are typically less than 15 cubic feet per second (CFS). According to the Flood Insurance Study for the Village of Ilion (FEMA, 1999), "the greatest known flood on Steele Creek occurred in June 1922. Approximately 18% of the Village was inundated, and the Phillip Street and Whitney Street bridges were destroyed." Much damage was inflicted upon highways and streets along the creek and approximately 250 buildings were damaged. Flood losses were estimated in a US Army Corps of Engineers report to be approximately $418,000 (1971 dollars).

"Floods that impact the Steele Creek Basin are natural disasters that are highly dependent on weather conditions and will likely occur again and again over time"

Within the lower reaches of the Basin flooding may also be influenced by "backwater" conditions and flooding events on the Mohawk River. Given certain conditions, a storm event that may not normally cause overbank flooding within the Steele Creek Basin may cause severe flooding if the Mohawk River itself is in a flood stage. In essence, water traveling down the Steele Creek has no place to discharge and water begins to "back up" into the Steele Creek channel. The US Army Corps of Engineers estimates the upstream limit of the 100-year flood and backwater influences from the Mohawk River to be near the electric substation just north of the Main Street bridge.

There are many other factors that may influence whether flooding occurs on Steele Creek. These may include: the severity of the storm; the duration of the storm and size of the stream basin impacted (i.e. a 100-year storm of a 30 minute duration in a 1 square mile basin will be more significant on streamflow than the same storm in a 25 square mile basin); the location of the storm within the basin in relation to upland tributary areas or downstream areas; the timing of the storm event in relation to peak flows (i.e. whether the storm event occurs when the flow on Steele Creek or the Mohawk River is already high); the state of vegetative cover and soil conditions just prior to the storm (i.e. dry soil allows for great infiltration into the soil, reducing the amount of runoff in the stream system, while "wet" or "saturated" soil has the opposite effect); general climate conditions; and the probability that ice jams will form as a result of these conditions.

Since many of these influences are unpredictable and uncontrollable, it is important for the communities to assume that flooding **WILL** continue to occur within the basin. As a result, proper planning and mitigation activities are necessary to minimize the impact of flooding to the communities.

2.3 – Defining the Flood Hazard Areas

Mitigation decisions are made according to the degree of risk that the population or structures face during various storm and flooding events. With the enhanced mapping and modeling technologies developed for the Steele Creek Basin, multiple scenarios can be presented and analyzed to predict the surface extent of various floods and depth of floodwaters. For the purposes of this plan, the following flood scenarios were chosen as a representation of:

1) flood extents that are representative of existing programs (such as the National Flood Insurance Program) and reflect the one-percent (1%) chance of an "open channel" flood event occurring in any given year (i.e. the 100-Year "Open Channel" Event),

2) flood extents that reflect more localized conditions such as snow melt and ice jamming that could result in larger floodplain areas and deeper floodwaters (i.e. the 100-Year "Combined Event"), and

3) flood extents that reflect a potential "worst case" scenario as if many undesirable conditions occurred simultaneously (i.e. The 500-Year "Combined Event").

These three flood hazard areas are geographically defined on Figure 2, and are described in more detail below. It should be noted that, as mapped on Figure 2, the flood hazard areas are shown cumulatively. As an example, the 500-year "Combined Event" will include underlying areas for the 100-year "Open Channel" and 100-year "Combined Event". Areas shown in a particular color represent those "additional" areas which have not been included in the smaller, preceding flood hazard area.

The 100-Year "Open Channel" Event – To provide a national standard on which to base floodplain management programs (without regional discrimination), the Federal Emergency Management Agency (FEMA) has adopted a standard methodology to define flood hazard areas. Flood hazard mitigation plans typically consider the 100-year flood or 100-year floodplain for planning purposes. The standard 100-year flood may also be referred to as the "Open Channel" or "Open Water" event.

The 100-year flood is defined as a flood that has a one-percent chance of occurring in any given year. The 100-year floodplain is mapped for most communities in New York State and these maps are used as part of hazard mitigation programs such as the National Flood Insurance Program (NFIP) (*see Section 5.2 for additional detail*).

The 100-year designation is often misunderstood but simply represents the statistical probability of a base flood level that has a 1% chance of being reached or exceeded in any given year. However, this definition is based only on a predicted probability. For example, if a 100-year flood occurs once during any given year, there is a chance that it could occur again within that same year. In addition, the 100-year flood in no way represents the worst possible flood that could happen. Table 2 summarizes the statistical probability of experiencing various flood events over any number of years.

Further, the 100-year storm event may not always produce the 100-year flood. Whether this occurs is based on several factors – including those previously mentioned in Section 2.2, and on the amount of development and impervious surfaces within the floodplain. Development and urbanization in the floodplain is a factor that can be controlled by municipalities and is discussed in Section 6 and Section 7.

Table 2: *Percent Chance of a Flood Occurring within a Given Timeframe.*

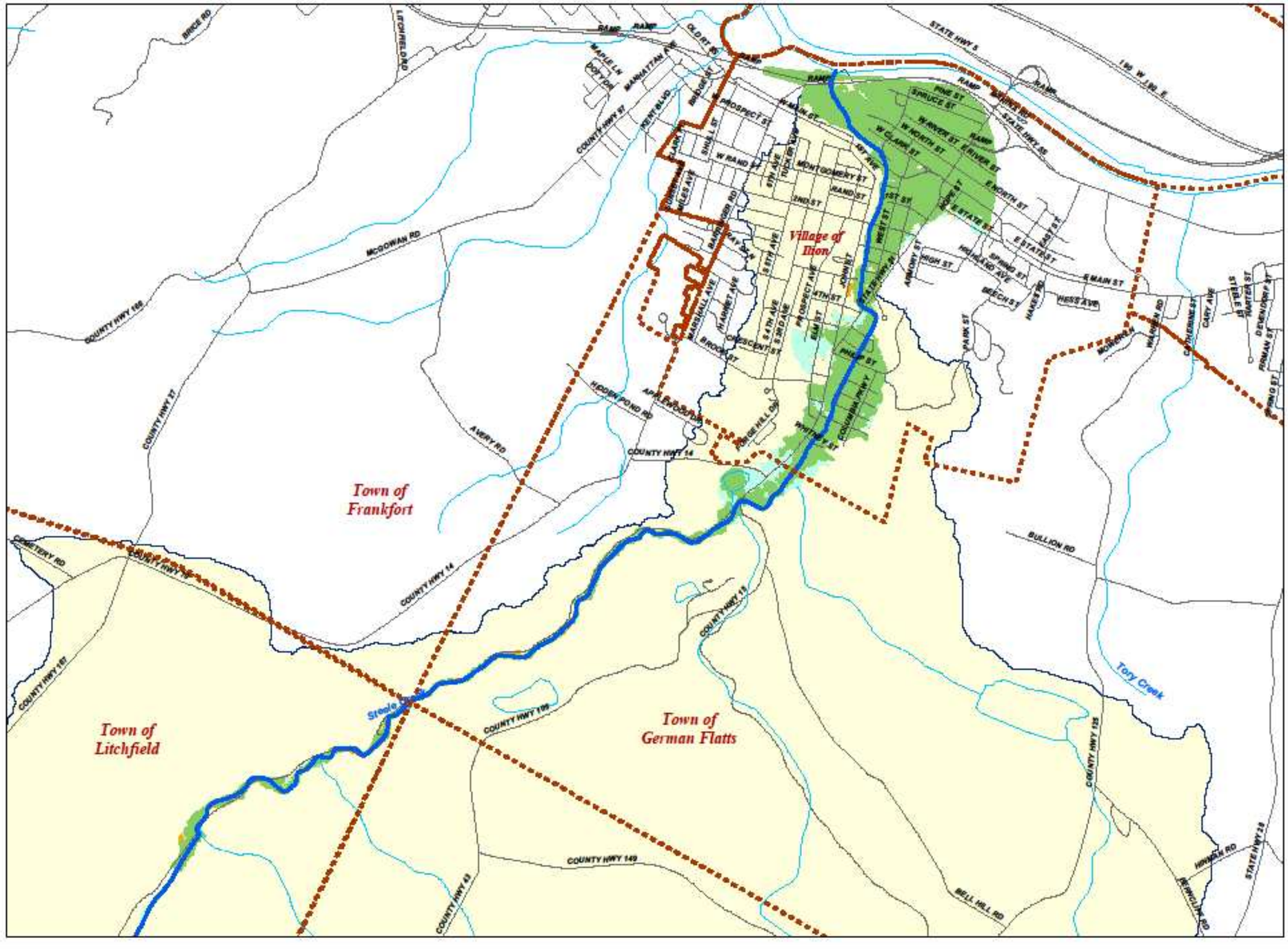
	10-Year Flood	**25-Year Flood**	**50-Year Flood**	**100-Year Flood**	**500-Year Flood**
1-Yr Timeframe	10%	4%	2%	1%	0.2%
10-Yr Timeframe	65%	34%	18%	10%	2%
20-Yr Timeframe	88%	56%	33%	18%	4%
25-Yr Timeframe	93%	64%	40%	22%	5%
30-Yr Timeframe	96%	71%	45%	**26% ***	6%
50-Yr Timeframe	99%	87%	64%	**39% ***	10%
100-Yr Timeframe	99.99%	98%	87%	63%	18%

***** = ***Example:*** *A person with a 30 year mortgage for a house within the 100-year floodplain has a 26% probability of being flooded at least once before the end of the loan. If that person lives in the structure for 50 years, the probability of experiencing at least one flood increases to approximately 40%. (Source: NYS Department of Environmental Conservation).*

Because there are no stage gauges on Steele Creek, the 100-year "Open Channel" flood hazard area has been defined based on runoff measurements from similar basins in the region. The runoff that is measured may be from rainfall and/or snowmelt.

Figure 2
Flood Hazard Areas

Steele Basin



0 1,000 2,000 4,000
Feet

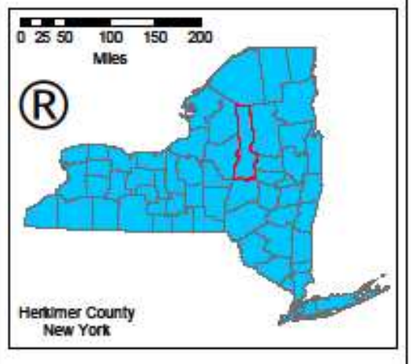
Legend

Flood Conditions

- 100 Year "Open Channel"
- 100 Year "Combined"
- 500 Year "Combined"

- Steele Basin
- Municipal Boundaries
- Steele Creek
- Rivers, Streams, Creeks
- Roads

Note: Flood zone areas are cumulative. Example: 500 year flood zone also includes both 100 year flood extents.



The 100-Year "Combined Event" – While the FEMA approved 100-year floodplain within the Steele Creek Basin is based only on an open channel event, other watershed characteristics and special considerations can be taken into account to define a flood scenario reflective of local conditions. As previously stated, much of the flooding in the Steele Creek Basin occurs as a result of winter conditions. Through enhanced computer mapping and modeling technologies, various flood frequencies within the Steele Creek Basin have been defined based on considerations such as different rain and snow discharges, backwater conditions, and ice jamming conditions. There are an unlimited number of various scenarios, however, for the purposes of this plan, the 100-year "Combined Event" (including 100-Year rain and snow hydrology with 100-Year ice jamming conditions and influences from the 100-Year Mohawk "Backwater" conditions) was considered as an alternative delineation of realistic floodplain boundaries. To predict the ice jamming conditions within the Steele Creek Basin, ice jamming was modeled at two locations. One jam with the downstream extent at the abandoned railroad bridge near NYS Route 5s. The other jam was located at the Otsego Street bridge.

The 500-Year "Combined Event" – While it is nearly impossible to predict the potential combinations of conditions that could cause the worst case of flooding in the Steele Creek Basin, for the purposes of this plan, the 500-year "Combined Event" was chosen as a representative example of a "Worst Case" scenario. This "Worst Case" scenario is defined as the 500-year "rain on snow" hydrology with 500-Year ice jamming and 500-Year backwater conditions from the Mohawk River. To predict these conditions within the Steele Creek Basin, ice jamming was modeled at two locations. One jam was located, with the downstream extent, at the abandoned railroad bridge near NYS Route 5s. The other jam was located at the Otsego Street bridge.

*(Note: The data used to map the 100-Year and 500-Year "Combined Extents" originated from the US Army Corps of Engineers. As a result of data collection difficulties in determining terrain surface elevations, the most recent Corps data (June 18, 2004) omitted a significant number of stream cross sections. Since it is preferable to have a value at each cross section in order to more accurately map the flood boundary extent, the water surface elevations for all omitted sections were interpolated by the mapping software Flood*Ware. The resulting flood boundary extents are illustrated on Figure 2)*

2.4 – Population, Housing and Socio-Economic Characteristics

An analysis of the 2000 Census information showed an estimated 6,279 people live within the Steele Creek Basin. Not surprisingly, 69% of people that reside within the basin live within the Village of Ilion. If the basin populations within the Village of Ilion and Town of Columbia are combined, approximately 80% of the basin population lives within these two municipalities.

Table 3: *Population Characteristics*

Municipality	Total Pop. in Municip.	Estimated Pop. in Basin	Percent of Basin Pop. by Municip.	Est. Pop. in 100-Yr "Open Channel" Flood Plain	Est. Pop. in 100-Yr "Combined Event" Flood Plain	Est. Pop. in 500-Yr "Combined Event" Flood Plain
Ilion (V)	8,610	4,358	69%	2,079	2,095	2,114
German Flatts	2,575	475	8%	12	30	30
Columbia	1,630	706	11%	0	0	0
Litchfield	1,453	492	8%	12	12	12
Winfield (T)	1,074	233	4%	0	0	0
Frankfort (T)	4,691	15	<1%	0	0	0
TOTAL	**20,033**	**6,279**	**100%**	**2,103**	**2,137**	**2,156**

As illustrated on Table 3, the "Total Municipal Populations" were derived directly from Census 2000 data. As shown, the town population totals do not include village population totals. The "Estimated Population in the Basin"

was also determined based on census block-level population data. However, when only a small portion of the census block was located within the basin boundaries, a combination of 1) an estimate of the total area of that block falling within the basin, and 2) an interpretation of where populations were concentrated based on aerial photography, was used to determine more accurate population estimates.

The population estimates within the three flood hazard area scenarios in Table 3 were determined by analyzing multiple data sources such as: parcel data, real property classifications for residential properties, aerial imagery of housing units, and GIS data for surveyed structures, combined with a multiplier for the average population per household. It should be noted that population estimates included within the three flood hazard area scenarios may include populations from municipalities located outside the basin because during certain flooding events the low-lying downstream areas experience water depths that flow beyond the topographical basin boundaries.

Table 3 illustrates that a relatively large number of people (2,103) reside within the "100-Year Open Channel" flood plain within the basin. The "100-Year Open Channel" floodplain is the area most closely resembling the FEMA designated 100-year floodplain on the current Flood Insurance Rate Maps (FIRMs). When additional local conditions are included in the analysis (such as ice jamming and backwater conditions for the 100-year "combined event"), the potential basin population at risk within the flood hazard area increases only slightly, by 34 people. The population in the flood hazard areas of the 100-year and 500-year combined events does not increase significantly (as it does within the Moyer and Fulmer Creek Basins) because these two flood hazard areas are relatively congruent to the 100-year open channel floodplain. It should be noted however that, while the outside extent of the three floodplain scenarios does not change significantly, the depth of flood waters will vary depending upon the specific storm event.

Housing Units - The 2000 Census information was also combined with aerial imagery, surveyed structure data, real property data, and parcel information to provide estimates regarding the number and characteristics of housing units within the flood hazard areas of the Steele Creek Basin.

Specifically, "Total Housing Units in the Municipality" were derived directly from the Census 2000 block-level data. Information for "Estimated Housing Units within the Basin" was also determined based on census block-level population data. However, when only a small portion of the census block was located within the basin boundaries, a combination of 1) an estimate of the total area of that block falling within the basin, and 2) an interpretation of where housing units were concentrated based on aerial photography, was used to determine more accurate estimates.

Housing unit estimates within the three floodplain scenarios are included within Table 4 and were determined by analyzing multiple data sources such as: parcel data, real property classifications for residential properties, aerial imagery of housing units, and GIS data for surveyed structures. It should be noted that housing unit estimates included within the three floodplain scenarios may include units within municipalities located outside the basin because during certain flooding events the low-lying downstream areas experience water depths that flow beyond the topographical basin boundaries.

As Table 4 illustrates, there are an estimated 2,512 residential housing units within the basin. Almost 40% of these units (913 units) are located within the 100-year open channel flood hazard area. Similar to the population estimates, when additional local conditions are included in the analysis (such as the inclusion of ice jamming and backwater conditions for the 100-year "combined event"), the estimated number of units within the flood hazard areas increases only slightly. Most of the housing units in the flood hazard areas (98%-99%) are located within the Village of Ilion.

Table 4: *Housing Characteristics*

Municipality	Total Housing Units in Municipality	Estimated Housing Units in Basin	Est. Housing Units in 100-Yr "Open Channel" Flood Plain	Est. Housing Units in 100-Yr "Combined" Flood Plain	Est. Housing Units in 500-Yr "Combined" Flood Plain
Ilion (V)	3,623	1,676	903	910	919
German Flatts	617	207	5	13	13
Columbia	987	307	0	0	0
Litchfield	670	214	5	5	5
Winfield (T)	499	101	0	0	0
Frankfort (T)	2,017	7	0	0	0
TOTAL	**8,413**	**2,512**	**913**	**928**	**937**

Type of Housing – When considering a flood hazard mitigation plan, it is also important to look at the type of housing that is located within the flood hazard areas. For example, this type of analysis may help to determine whether flood-proofing or relocation would be a more feasible alternative for certain structures.

As illustrated on Table 5, of the 2,512 total housing units within the basin, approximately 91% are single or two-family homes while only 4% are classified as mobile homes. Similarly, 98% of the housing units within the 100-year "Open Channel" floodplain are single or two-family homes. Census estimates indicate that none of the housing units in the 100-year "Open Channel", the 100-year "Combined Event", or 500-year "Combined Event" floodplain areas are classified as "mobile Homes".

Table 5: *Percent of Housing Units by Type*

Type of Housing Unit	Est. Percent of Total Housing Units in All Basin Municipalities	Est. Percent of Total Units in Basin	Est. Percent of Total Units in 100-Yr "Open Channel" Flood Plain	Est. Percent of Total Units in 100-Yr "Combined Event" Flood Plain	Est. Percent of Total Units in 500-Yr "Combined Event" Flood Plain
Single and Two-Family Homes	86%	91%	98%	98%	98%
Mobile Homes	6%	4%	0%	0%	0%
All Other	8%	5%	2%	2%	2%
Total	100%	100%	100%	100%	100%

Parcels by Property Class – The information in Table 6 was obtained from Real Property data used for property tax purposes. It should be noted that if any portion of a parcel was within the basin or floodplain boundaries, that parcel was included in the total number of parcels calculated. Again, the analysis within the three floodplain scenarios may include parcels located outside the basin because during certain flooding events the low-lying downstream areas experience water depths that flow beyond the topographical basin boundaries.

Table 6 illustrates that the various percentages of residential property types are relatively consistent when comparing the percent of residential "Parcels within the Basin" (68%) and residential "Parcels within the 100-year Open Channel (68%), 100-Year Combined (65%), and 500-Year Combined (66%) floodplains". However, when looking at commercial/industrial and open space areas, it is notable that the percent of parcels used for commercial/industrial significantly increases in the floodplain areas as the percent of parcels classified as agriculture, parks, open space, or left vacant decreases in the floodplain areas. Said differently, there appears to be a significantly higher percentage of developed parcels (commercial/industrial) in the floodplain areas.

Table 6: *Parcels by Property Class*

Property Classification	Number of Parcels in All Basin Municipalities (% of Total)	Number of Parcels in Basin (%)	Number of Parcels in 100-Yr "Open Channel" Flood Plain (%)	Number of Parcels in 100-Yr "Combined Event" Flood Plain (%)	Number of Parcels in 500-Yr "Combined Event" Flood Plain (%)
Residential	6,260 (60%)	2,073 (68%)	669 (68%)	798 (65%)	801 (66%)
Commercial and Industrial	365 (3.5%)	74 (2%)	115 (12%)	134 (11%)	134 (11%)
Agriculture, Vacant, Parks and Open Space	3,154 (30%)	727 (24%)	133 (13%)	183 (15%)	183 (15%)
Recreation and Community Services	149 (1.5%)	51 (2%)	38 (4%)	44 (4%)	43 (3.5%)
Public Services	88 (<1%)	24 (<1%)	8 (<1%)	13 (1%)	13 (1%)
Not Classified or Unknown	392 (4%)	92 (3%)	24 (2%)	46 (4%)	47 (3.5%)
TOTAL	**10,408**	**3,041**	**987**	**1,218**	**1,221**

SECTION 3 - THE FLOOD HAZARD MITIGATION PLANNING PROCESS

While a community can't control the weather, it can plan for the inevitable flood and provide ways to reduce the damages and impacts caused by flooding. Proper flood hazard mitigation planning will also greatly improve the safety of area residents. This Multi-Community Flood Hazard Mitigation Plan summarizes actions the communities can take to lessen (or "mitigate") impacts from flooding. The Plan also serves as: 1) a resource of agency contacts and funding assistance opportunities; and 2) an educational tool for local officials and the public.

This Multi-Community Flood Hazard Mitigation Plan was developed by the "Multi-Community Working Group" in accordance with the guidelines of the National Flood Insurance Program's - Community Rating System (CRS) and the ten step process as suggested by the NYS Department of Environmental Conservation. These steps include:

Step 1 - Map the Hazards - Where Are They?
Step 2 - Determine Potential Damage - What Are the Risks?
Step 3 - Identify What's Already in Place - What Are We Already Doing?
Step 4 - Identify What's Not Already Being Done - Where Are the Gaps?
Step 5 - Brainstorm Alternatives - What Actions Can Be Taken?
Step 6 - Evaluate Actions - What is Feasible?
Step 7 - Coordinate With Others - Who Else is Doing This?
Step 8 - Select Actions - What Are Our Priorities?
Step 9 - Develop a Strategy - How Do We Implement Actions?
Step 10 - Adopt and Monitor the Plan - Putting it All Together.

In addition to these steps, public input and participation was incorporated throughout the planning process.

3.1 - Benefits of the Plan

The primary purpose of this Multi-Community Flood Hazard Mitigation Plan is to provide the communities in the Steele Creek Basin with a coordinated and well thought-out strategy for addressing and reducing flood damages. As such, the primary benefit of this Plan is that it identifies pre-emptive actions that the communities can implement to both reduce damages caused by flooding and reduce the time it takes to recover from a flooding event.

Flooding in populated areas is expensive. Annual economic losses in New York State are estimated to be in excess of $100 million. Not only are costs incurred as a result of structural damage, but there are related costs in: the disruption of commerce; unemployment due to flooded workplaces; inundated transportation and infrastructure systems; disaster relief; and clean-up.

This Multi-Community Flood Hazard Mitigation Plan will provide cost savings by: 1) Reducing the number of structures impacted; 2) Providing the community with better access and eligibility to funding assistance and grant programs, and; 3) Providing residents and businesses with reductions in flood insurance rates.

Further, the plan establishes priorities and needs that the community can use in formulating more cost effective policy such as those relating to capital improvements, land use planning, and economic development.

This Plan provides other benefits as well. The planning process followed in the Steele Creek Basin was unique in that it focused on and provided for intermunicipal coordination of management efforts on a watershed basis so as not

to shift problems to downstream communities. The planning process also established many relationships that each of the communities can utilize in the future. For example, the communities may benefit from the experience of the federal, state, regional and county agencies involved in the process. The planning process also utilized extensive Geographic Information System (GIS) technology and data sharing resulting from the US Army Corps of Engineers Flood Control Feasibility Study and the NYS Department of Environmental Conservation digital mapping efforts.

The planning process, and the implementation of the Plan itself, relies on community input and acceptance. Therefore, community education is a key factor that will provide a number of supplemental benefits. In addition to providing an improved public awareness and understanding of the problem, the concepts of flood hazard mitigation are more easily understood and accepted. Community input and education insures that interested residents take part in creating solutions and implementing the Plan's recommendations.

The following graphic provides a summary of the benefits that this Flood Hazard Mitigation Plan will provide to the community.

BENEFITS OF THE COMMUNITY FLOOD MITIGATION PLAN

- ☑ A coordinated and well thought-out strategy for addressing and reducing flood damages.
- ☑ Identification of pre-emptive actions to reduce damages caused by flooding and the time it takes to recover.
- ☑ Cost savings.
- ☑ Establishment of priorities and needs for use in formulating policy.
- ☑ Intermunicipal coordination of management efforts on a watershed basis.
- ☑ Establishment of relationships and utilization of experience of federal, state, regional and county agencies.
- ☑ Fish and wildlife habitat improvements
- ☑ Extensive Geographic Information System (GIS) technology and data sharing.
- ☑ Community education and involvement

3.2 – Community Involvement

This Flood Hazard Mitigation Plan was developed through a coordinated effort that involved the “Multi-Community Working Group”, the Herkimer-Oneida Counties Comprehensive Planning Program, the NYS Department of Environmental Conservation, and the US Army Corps of Engineers.

Each of the key communities within the Steele Creek Basin formally joined together through the passage of respective municipal resolutions, to create the “Multi-Community Working Group”. In addition to local government representatives, the “Multi-Community Working Group” was comprised of representatives from other public agencies, businesses, and private citizens.

The first formal meeting of the Working Group was in November of 1999 and the Group has met regularly throughout the planning process. For additional information, a listing of Working Group members, available meeting notices and minutes are included within Appendix A of this plan.

3.3 - Goals and Objectives

As part of the planning process it was important to identify the primary goals and objectives of what the communities within the basin were trying to accomplish with regard to the preparation of this plan and subsequent flood hazard mitigation activities for Steele Creek. The following listing identifies those goals and objectives identified by the Multi-Community Work Group during the flood mitigation planning process. Many of these goals and objectives have been reached as a result of the completion of this plan. The remaining goals and objectives will be accomplished as specific implementation activities are completed.

GOAL	To prepare and implement a plan that will lessen the impacts of flooding **BEFORE** they happen.	**OBJECTIVES**	• Identify populations and structures at risk during various storm events • Identify alternatives to reduce or eliminate the risk • Protect lives and property
GOAL	To reduce expenditures associated with recovery from flood damages.	**OBJECTIVES**	• Provide cost savings to residents in relation to damages, insurance rates, and state/federal disaster recovery assistance. • Better access to funding sources/grants for community flood mitigation priorities
GOAL	Maintain the essential character of the community while providing for the implementation of flood hazard mitigation activities.	**OBJECTIVES**	• Preserve the existing land use pattern • Maintain fish and wildlife habitats • Provide linkages to and enhance recreational and open space opportunities
GOAL	Educate and involve the public to create an awareness of hazards and obtain support for mitigation activities.	**OBJECTIVES**	• Create and implement an on-going public participation program. • Develop and/or distribute educational materials.
GOAL	Insure community efforts, plans and programs are continued into the future.	**OBJECTIVES**	• Document and institutionalize Mitigation Plans to insure future local administrations understand the intent of current efforts and priorities. • Develop maintenance and management programs for recommendations. • Monitor and update plans on a regular schedule.

SECTION 4 - RISK INVENTORY AND HAZARD MAPPING

As described in Section 2, the primary hazard to be addressed in this plan includes flooding from runoff (such as, but not limited to, runoff during summer storm events) and flooding related to ice jamming conditions with the resultant back-up of water and overbank flooding. The following text provides a summary of information regarding: the location of flood hazard areas within the Steele Creek Basin; critical facilities and other development located within these hazard areas; road and bridge blockages resulting from flooding; areas of extensive streambank erosion; and other critical natural areas that may help to reduce impacts from flooding. This information is developed from and further supported by: Geographic Information System (GIS) mapping developed by the Herkimer-Oneida Counties Comprehensive Planning Program (HOCCPP) and the NYS Department of Environmental Conservation; Flood Insurance Rate Maps provided through the National Flood Insurance Program (NFIP); community Flood Insurance Studies, and the US Army Corps of Engineers Flood Mitigation Feasibility Study (2004).

It is important to note that while existing facilities and development have been evaluated, the risk assessment has also considered potential problems that will occur if future development and/or alteration of the floodplain are permitted.

4.1 Hazard Mapping

There is extensive and highly detailed GIS mapping available for the Steele Creek basin that has resulted from the enhanced floodplain mapping effort in the basin and the US Army Corps of Engineers' structural flood control feasibility study. The GIS mapping allows key agencies and the communities to view various flood scenarios that are based on a range of storm events and/or ice jamming conditions. The 100-year "open channel" floodplain is traditionally used as the "regulated" area or "base floodplain" as part of FEMA's National Flood Insurance Program. However, through the use of the GIS, the floodplains can also be illustrated for any number of scenarios including the 2-year, 10-year, 50-year, or 500-year events - with any combination of influencing characteristics such as ice jamming, snow hydrology and/or backwater conditions.

In addition to flood hazard areas, the GIS also provides mapping and related information to the communities regarding such characteristics as, but not limited to: building locations, locations of critical facilities, ownership and Real Property tax information, parcels, road and bridge locations, natural resources such as wetlands, topography, sub-basins, and drainage systems. Much of this information has been provided to the communities in hard-copy format and may be provided digitally to the key communities in the future.

4.2 Critical Facilities and Floodplain Development

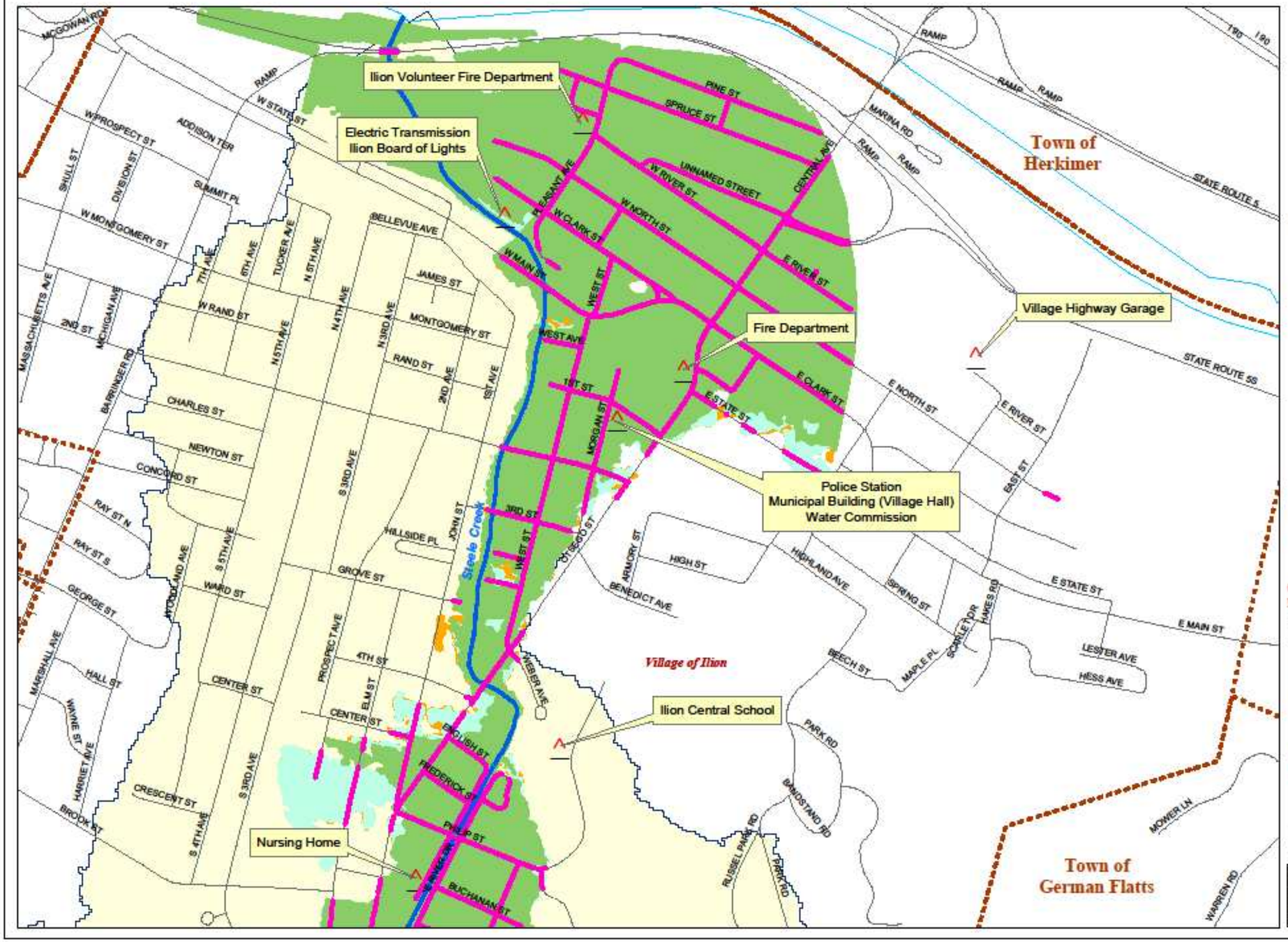
In any flood hazard mitigation plan, "critical facilities" must be identified because of their importance in the services that these facilities provide during flood emergencies. "Critical facilities" may include actual structures that house emergency or health related personnel such as fire stations, police stations, ambulance services, or hospitals. However, "critical facilities" may also relate to infrastructure providing water supply, wastewater treatment, heating, and electric. Within the Steele Creek Basin, there are relatively few "structures" relating to critical facilities that are impacted by flooding events. However, while "structures" may not be impacted, there are numerous types of infrastructure and services that may be impacted by flooding. The critical facilities, structures and infrastructure that may be impacted by various flooding events are discussed below and are illustrated on Figure 3.

The most obvious impact to "critical facilities" involves the closure of roads and bridges during flood emergencies. The closure of roads and bridges directly impacts the ability of residents to evacuate an area and it impacts the ability of emergency vehicles to provide needed services to those areas. Road and bridge blockages are discussed further in Section 4.3.

Wastewater Treatment – The Village of Ilion obtains municipal sewer services from the Herkimer County Wastewater Treatment Plant that is located within the adjoining Village of Mohawk. The wastewater treatment plant is not directly affected by flooding on Steele Creek but may be impacted when flooding occurs on the Mohawk River

Figure 3
Critical Facilities

Steele Basin



Legend

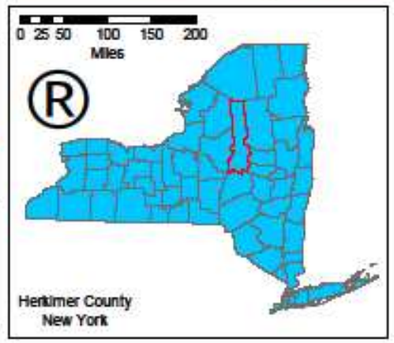
Flood Conditions

- 100 Year "Open Channel"
- 100 Year "Combined"
- 500 Year "Combined"

- Steele Basin
- Municipal Boundaries
- Steele Creek
- Flood Prone Roads
- Rivers, Streams, Creeks
- Roads
- Critical Facilities

0 210 420 840 1,260 1,680
Feet

Note: Flood zone areas are cumulative. Example: 500 year flood zone also includes both 100 year flood extents.



or in the Fulmer Creek Basin. However, according to the wastewater plant operator, flooding within the Mohawk River and Fulmer Creek basin has a relatively minor impact to the plant since it has been designed and constructed above the 100-year flood elevations. While the buildings and equipment are typically NOT impacted by flooding, treatment processes at the facility may be impacted by infiltration of flood flows into the sanitary sewer. During times of wet-weather, spring thaw, and flooding, often the volumes coming into the plant exceed the plant's capacity to accept these volumes. This condition typically requires an "in-plant bypass" that results in a flow violation to the State Pollution Discharge Elimination System (SPDES) permit. According to the Plant Operator this happens approximately once per year. Interruption of electric service is not a primary concern since the plant operates with emergency generators.

During times of flooding, it is possible for sewage to be forced out of manholes. Based on this condition, it is important to note the potential health risks caused by untreated sewage mixing with floodwater on streets and lawns.

In those areas south of the Village of Ilion municipal boundary, most residential properties rely on individual septic systems that typically include a septic tank and leach field. These systems will not operate properly if inundated with floodwater and may cause additional health risk to downstream areas.

Water Supply - The areas in and adjacent to the Village of Ilion are serviced by the Village of Ilion municipal water supply. The source of water to this system includes multiple reservoirs and intakes that are located within the Steele Creek basin but outside the flood hazard areas. The filtration and distribution facilities are also located outside the flood hazard areas.

In those areas south of the Village of Ilion where municipal water is not available, most commercial and residential properties rely on individual water supply systems. There is a concern regarding the potential for contamination of these individual wells from non-point source pollution (such as sewage discharge) during flooding events.

Critical Structures – The police station and various fire stations serving the Village of Ilion are located within the 100-year "Open Channel" flood hazard areas. This condition may impact the ability of emergency vehicles to provide needed services during flooding events. Similarly, the Village Hall and Board of Water Supply offices are located within the 100-year "Open Channel" flood hazard areas near Morgan Street. Another structure of note that is within the 100-year "Open Channel" flood hazard area includes the Ilion Board of Light on Pleasant Ave. This facility contains electrical transmission equipment.

The area hospitals, the municipal highway garages, and the buildings of the Ilion Central School District are located outside the 100-year open channel and 500-year combined flood hazard areas. However, portions of the school property (exclusive of principle buildings) are located within the flood hazard areas. Additionally, as discussed in Section 4.3, many of the roads and bridges surrounding these facilities may be inundated by floodwater.

One structure that could potentially require special consideration during flood emergencies is the nursing home located on East River Drive. This facility is located within the 100-year "Open Channel" flood hazard area. Most of the other structures within the flood hazard areas involve private residential and commercial uses.

Floodplain Development - General development patterns within the basin were also examined to evaluate the potential for obstruction of flood flows, future damage to property, loss of commercial services, the potential for future development in the floodplain, etc.

Development, and development that is prone to flooding within the Steele Creek Basin, is especially extensive within the downstream communities such as the Village of Ilion and in the areas adjoining the village/town municipal boundary. As noted in Section 2.4, there are approximately 928 housing units within the 100-year "Combined Event" floodplain area. Almost the entire downtown commercial district within the Village is within the 100-year flood hazard area. Although there is significant development already existing within the flood hazard areas, future development patterns within these areas will likely not change significantly because there are relatively few vacant parcels.

Near the Village/Town boundary, areas within the Town of German Flatts are experiencing continued residential development pressure (and limited commercial development) along the NYS Route 51 corridor. Special attention should be paid to this type of development – especially since Route 51 closely parallels Steele Creek. Areas further upstream along the gorge will likely not experience significant development because the steep slopes within the gorge inherently limit development.

Specific land use regulations that are present within each municipality largely dictate the type and density of development that is permitted within the basin. This information is discussed further in Section 5.1 regarding "Local Land Use Management".

4.3 - Road and Bridge Blockages

It is important to identify areas of road and bridge blockages caused by flooding because this directly impacts the ability of residents to evacuate an area and it impacts the ability of emergency vehicles to provide needed services to those areas. It should be recognized that road and bridge blockages (both the length of the segment being flooded and the depth of the floodwaters) will vary based on the different storm events and/or combinations with ice jamming, backwater conditions, etc., as described in Section 2.3. The following Table provides a summary of roads and bridges that will be flooded during the 100-Year "Combined Event" on Steele Creek.

Table 7: *Flooded Roads and Bridges*

STREET / ROAD NAME	APPROX. DEPTH (ft)	ESTIMATED SEGMENT LENGTH (ft)	DESCRIPTION
Abandoned Railroad Bridge	2.3 ft	(see description)	Bridge deck flooded.
Pine Street	2-3	(see description)	The entire length from Central Ave to Pleasant Ave.
Spruce Street	0-3	(see description)	The entire length from Central Ave to Pleasant Ave. Depth lessens to the west near Commerce St.
Commerce St	2-3	(see description)	The entire length from Spruce St to Pleasant Ave.
Central Ave.	2-3	(see description)	The segment from near Pine St to the Clark St intersection.
NYS Rt 5s Ramps	2-3	525 ft	Both entrance and exit ramps are flooded for approximately 525 ft east of Central Ave.
W. River St	2-3	(see description)	The entire length from Pleasant Ave. to Central Ave.
E. River St	2-3	800 ft	The segment from Central Ave. to near the school is flooded.

Elizabeth St	2-3	100 ft	The segment 100 ft north from intersection with E River St
E. North St	2-3	1000 ft	From intersection of Central Ave. eastward toward the school.
W. North St	2-3	(see description)	Entire length from Central Ave to Pleasant Ave. and approximately 610 ft west of Pleasant Ave.
E. Clark St	2-3	(see description)	From intersection of Central Ave to approximately 1160 ft east (near Catherine St).
W. Clark St	2-3	(see description)	The entire length from Central Ave to Pleasant Ave and approximately 450 ft west of Pleasant Ave.
West St	0-3	(see description)	The entire segment from W. Main St to W. Clark St. The depths are slightly shallower on the southern ½ of this segment.
West St	0-4	(see description)	The entire length going south from Main St to Otsego St. The depths vary from approximately 0-1 ft south of 3rd St, to 2-3 ft between 2nd St and 3rd St, and approximately 4 ft between 2nd St and Main St.
Pleasant Ave	0-3	(see description)	The entire length
W. Main St	0-3	(see description)	The depth is greater (2-3 ft) in the segment from the Main St bridge to Central Ave. An additional segment includes approximately 355 linear ft west of the Main St bridge.
Main St Bridge	1.5 ft	(see description)	Bridge deck flooded.
West Ave.	0-4	(see description)	The entire length. Depths are greater to the east near West St.
1st Street	0-4	(see description)	The entire length
2nd Street	0-3	(see description)	From Otsego St to the 2nd St bridge
3rd Street	0-3	(see description)	From Morgan St to the 3rd St bridge
Lewis Place	0-1	(see description)	The entire length
Mauser Place	0-1	(see description)	The entire length
Otsego Street	2-3	(see description)	The segment from Main St to E. State St.
Otsego Street	0-4	(see description)	The segment from E State St to 1st Street.
Otsego Street	0-1	(see description)	The segment 200 ft south of 1st St.
Otsego Street	0-1	(see description)	A segment approximately 170 ft near the intersection with 2nd St.
Otsego Street	0-5	(see description)	A segment adjacent to the area near the Otsego St bridge.
Otsego Street	0-4	(see description)	The segment from the Otsego St bridge to the intersection of John St.
Otsego Street	0-6	(see description)	The segment from Gordon Place to the Village/Town boundary.
Grove St	0-1	(see description)	A small segment between John St and Steele Creek.

John Street	0-4	(see description)	The segment from Otsego St north approximately 275 ft past the Center St intersection.
Elm Street	0-2	690 ft	The segment south of Center St.
Prospect Ave	0-1	(see description)	A 220 ft segment of the southern most section of the street.
English St	0-5	(see description)	The entire length
English St Foot Bridge	3.3 ft	(see description)	Bridge deck flooded.
Frederick St	0-7	(see description)	The entire length
Philip St	0-7	(see description)	The segment from Otsego St to Russell Park Rd.
Philip St Bridge	3.2 ft	(see description)	Bridge deck flooded.
Russell Park Rd.	0-1	(see description)	A 165 ft segment from the intersection with Philip St.
W. River Drive	0-7	(see description)	The entire length
E. River Drive	0-8	(see description)	The entire length
Richfield St	0-3	(see description)	The entire length from Otsego St to Columbia Parkway
Columbia Parkway	0-6	(see description)	The segment from Philip St to 240 ft south of Richfield St.
Buchanan St	0-6	(see description)	The entire length
Jefferson St	2-6	(see description)	The entire length
Monroe St.	2-6	(see description)	The entire length
Whitney St.	0-6	(see description)	The entire length
Whitney St Bridge	.2 ft	(see description)	Bridge deck flooded.
Remington Rd Bridge	2.3 ft	(see description)	Bridge deck flooded.
Spinnerville Gulf Rd Bridge	3.3 ft	(see description)	Bridge deck flooded.

4.4 - Areas of Erosion and Sedimentation

Areas of erosion and sedimentation are fundamentally linked to flooding and flood mitigation activities. As flooding occurs, stream discharge and the velocity of flow increase, causing erosion to vulnerable stream banks. Stream bank erosion can lead to the loss of property and increases the amount of sediment that is deposited within the stream channels. The accumulation of sediment increases the elevation of the stream bed and reduces the carrying capacity of the stream. Overtime, this combination of forces can result in higher water surface elevations during subsequent flood events, causing an increase in flooding. Additionally, during a flood event, sediment is often deposited in areas where the channel slope drops off and is relatively flat (such as at the mouth of Steele Creek).

On March 28, 2003, HOCCPP conducted a windshield survey of significant areas of stream bank erosion. As the inventory was completed, various sites were characterized as having "severe", "moderate", or "slight" areas of stream bank erosion. These categories were developed based on the approximate linear extent of the erosion, the approximate height of the eroded bank, and staff judgement on the potential amount of eroded materials the could potentially enter the stream from each site.

The eroded areas were also categorized as stream bank "cuts", stream bank "slumps", and areas of "steep or unstable slopes". Stream bank "cuts" were characterized by relatively low bank heights (e.g. +/- 5 feet) and long linear distances. These areas are typically located on the outside edge of various channel meanders. Stream bank "slumps" were characterized as relatively large areas of the stream bank that appeared to have had a structural failure of the underlying soils. As a result, large quantities of soil appeared to have collapsed and slid down the embankment. The slumps that were noted typically included relatively high banks and long linear distances that were eroded. Areas noted with "steep or unstable slopes" generally included a rather gravelly, shale-like rock face that may potentially contribute sediment to the creeks - more as a result of natural weathering and runoff.

A summary matrix of the type, severity, size and location of each stream bank erosion site is provided in Table 8. The full report on areas of erosion within the Steele Creek Basin is included within Appendix C and includes photographs of many of the sites inventoried. Figure 4 provides an overview of each site's location within the basin.

Table 8: *Areas of Streambank Erosion*

BASIN	SITE REFERENCE	TYPE	SEVERITY	ESTIMATED (ft)	
				HEIGHT	LENGTH
Steele	Spinnerville Road	Bank Slump	Severe	100	250
	Reservoir Site	Bank Slump	Moderate	50	50
	Ferdula Mine	Bank Slump	Moderate	100	300
	Jones Hill Road	Bank Slump	Slight	50	50
	Route 51 Bank Cut	Bank Cut	Moderate	<5	1600

4.5 - Critical Natural Areas

The presence of open space areas, wetlands, or agricultural areas can help to reduce the impacts of flooding and were, therefore, considered to be an important component to note in the analysis of flood hazard risk.

Large wetland areas may help to absorb flood flows, may act as natural sedimentation and retention basins, and/or may help to improve water quality. With regard to the Steele Creek basin, there are no significant areas containing DEC Regulated wetlands. Most of the regulated wetlands are found near the confluence of Steele Creek and the Mohawk River and, therefore, are of minimal value in helping to reduce impacts of flooding within the upstream areas.

Perhaps the most significant "natural areas" within the Steele Creek basin include the vacant parcels and agricultural areas that are interspersed with developed sites in the creek corridor. Within the Village of Ilion there are relatively

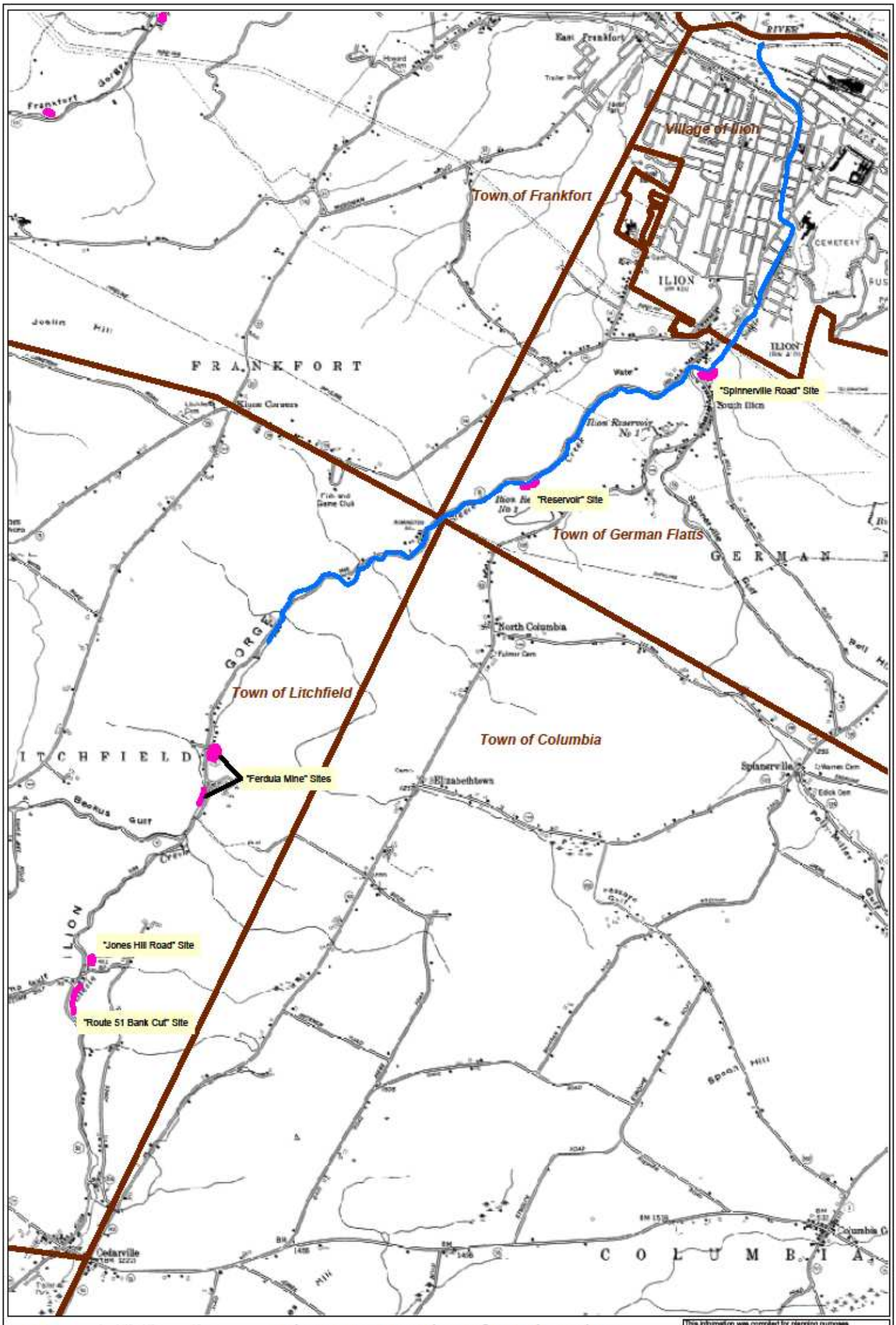


Figure 4: Location of Erosion Sites
Steele Creek

Date: August, 2004

small areas of open space, parks, or vacant lands. However, south of the Village and Town of German Flatts municipal boundary, there are significant areas of vacant land and agriculturally classified properties that are directly adjacent to the creek. Figures 5 and 5a show these areas within the 100-year "Combined Event" floodplain of Steele Creek. As discussed within the "Recommendations" – Section 7, consideration should be given to maintaining these sites as open space.

Agriculture is the predominant land use classification in the upper portions of the basin and there are numerous NYS Agricultural Districts present (See Figures 5 and 5a). The designation of land within an agricultural district may help to limit development and the resultant increase in impervious surfaces in these areas and, therefore, help to reduce stormwater runoff.

SECTION 5 - EXISTING EFFORTS AND PROGRAM GAPS

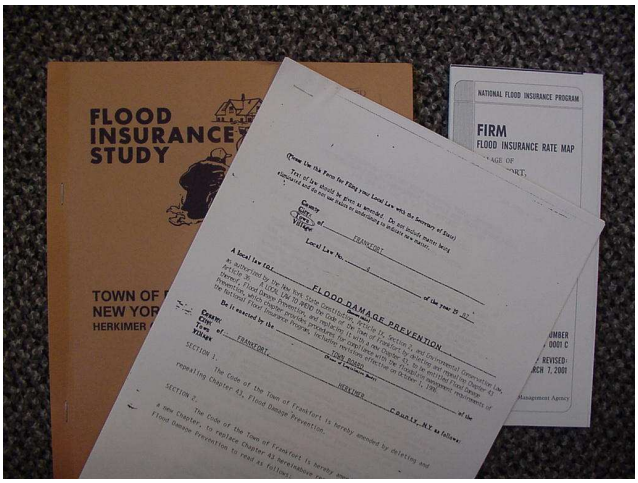
It is not only important to geographically identify the critical facilities and flood hazard areas within the Steele Creek Basin, but it is also necessary to note programmatic efforts that may abate flooding impacts. The following section of this Plan addresses the question of "What is already being done?" at the local, county, state and federal levels to mitigate flood hazards in the basin. It is as equally important to note "What has not been done?" so that certain gaps in the efforts can be addressed as part of this Plan's recommendations found in Section 7.

The following summary of efforts, programs and activities (along with respective Appendices) may also serve as a reference guide of mitigation programs available to local officials.

5.1 - Local Efforts and Program Gaps

There are a number of activities and programs at the local level that may relate directly to floodplain management. Such programs may include; local land use controls, capital improvement projects, policies/programs, and existing institutional structures such as districts and the "Multi-Community Working Group".

In New York State, the majority of land use control is accomplished at the local level of government. In most instances, the broad authority to adopt regulations to control the use of land is given by the State Legislature to the individual local units of government - the towns, villages and cities. Because specific land use controls are developed, adopted and implemented at the local government level they can vary dramatically from one municipality to the next. Therefore, local land use controls must be examined individually and in detail to assess their potential affect on floodplain management and the watershed.



Local Law for Flood Damage Reduction - Of the six (6) municipalities located in the Steele Creek Basin, all communities have adopted the model "Local Law for Flood Damage Reduction" developed by the NYS Department of Environmental Conservation. The Local Law for Flood Damage Reduction (also known as a "Local Flood Hazard Mitigation" or "Local Flood Hazard Prevention" law) is designed to comply with the requirements of the National Flood Insurance Program (NFIP). All the communities in the Steele Creek Basin participate in the National Flood Insurance Program (NFIP). The NFIP program is further described under "Federal Programs" noted below.

The general purpose of a Local Law for Flood Damage Reduction is "to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas". The law typically regulates uses that are deemed dangerous due to impacts from water or erosion or those that will result in increases in erosion or flood heights or velocities. The law requires that uses vulnerable to floods be protected at the time of initial construction. The law also incorporates guidelines for the physical alteration of property such as alterations of the floodplain itself, modification to the stream channel and/or natural protective barriers, filling, grading, dredging and other development which may increase erosion or flood damages.

During 2003, New York updated the State Building Code and incorporated many of the requirements of the NFIP as part of the building code. As a result, certain NFIP requirements may be part of the building code AND the Local Law for Flood Damage Reductions. During the later part of 2003, the NYS Department of Environmental Conservation revised the model Local Law for Flood Damage Reduction to address issues raised by the update of the building code.

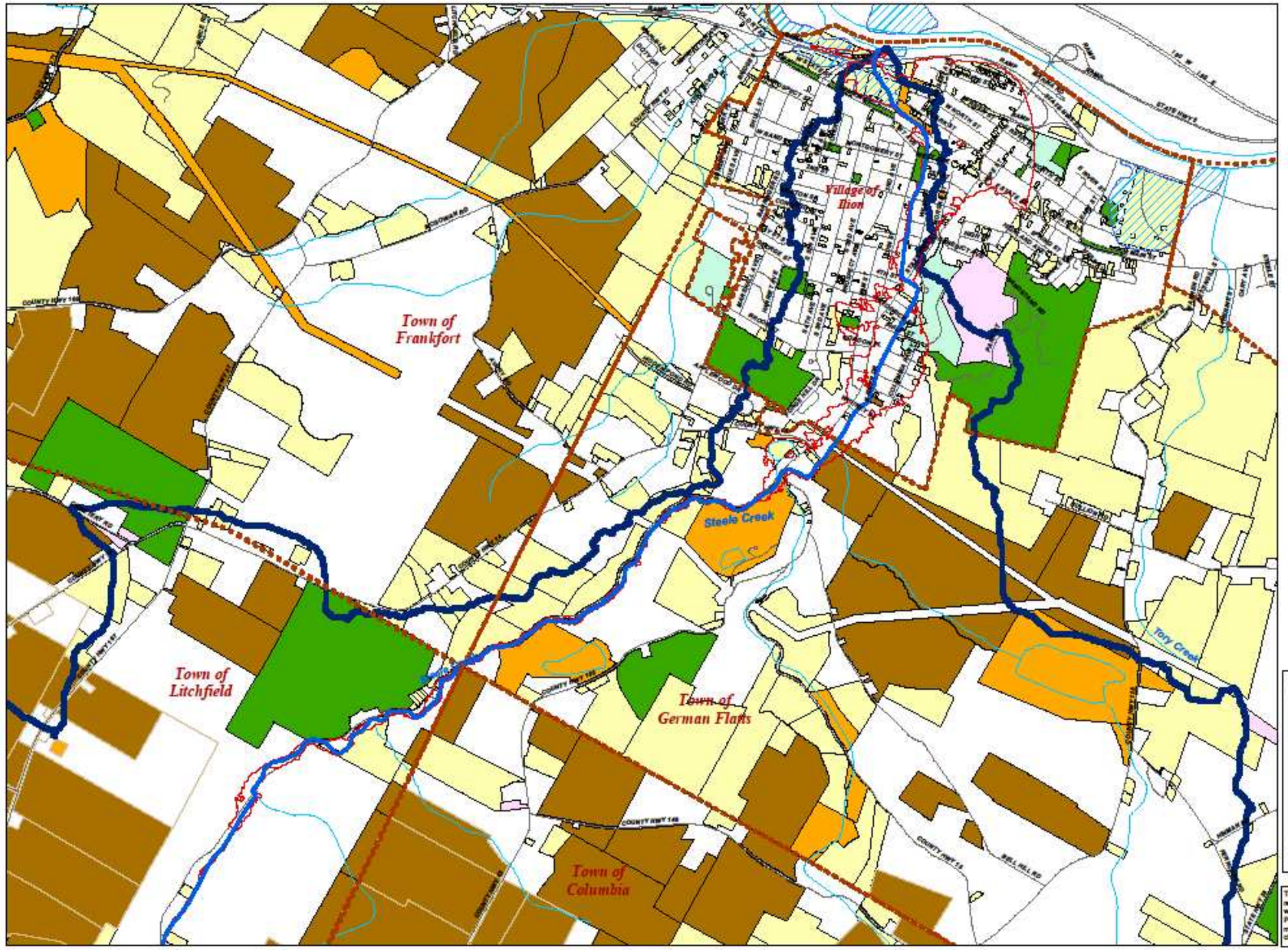


Figure 5
Critical Open Areas

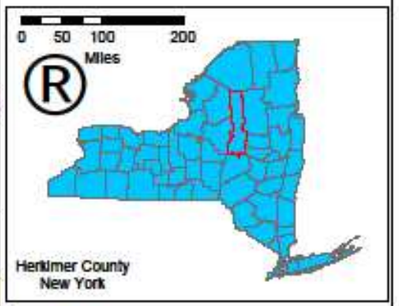
Steele Basin Upper

0 600 1,200 2,400 3,600 4,800
Feet

Scale: 1 inch = 2,000 feet

Legend

- Municipal Boundaries
- Steele Creek
- Steele 500 Year "Combined Extent"
- Steele Basin
- Rivers, Streams, Creeks
- Roads
- NYS Freshwater Wetlands
- Agricultural Parcels
- Cemeteries
- Ag. District
- School Grounds
- Recreation Areas
- Utility Parcels
- Vacant Parcels



Herkimer County
New York

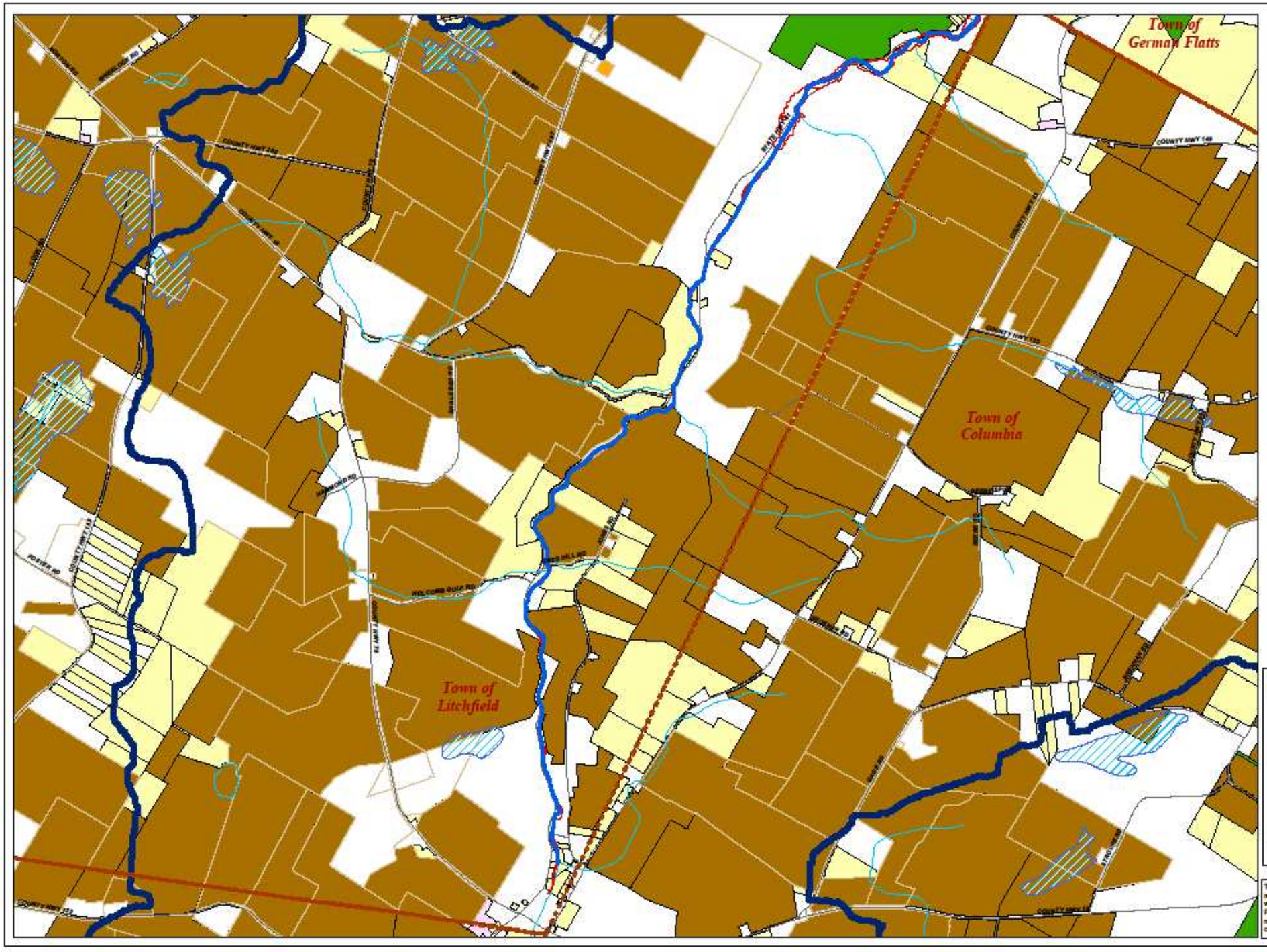


Figure 5a
Critical Open Areas

Steele Basin Lower

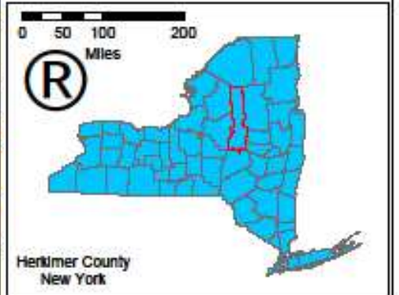
0 600 1,200 2,400 3,600 4,800

Feet

Scale: 1 inch = 2,000 feet

Legend

- Municipal Boundaries
- Steele Creek
- Steele 500 Year "Combined Extent"
- Steele Basin
- Rivers, Streams, Creeks
- Roads
- NYS Freshwater Wetlands
- Agricultural Parcels
- Cemeteries
- Ag. District
- School Grounds
- Recreation Areas
- Utility Parcels
- Vacant Parcels



Herkimer County
New York

General requirements included in the Local Law for Flood Damage Reduction requires a "flood development permit" for certain construction activities and proposed development within the designated Special Flood Hazard Area. The application for a permit requires plans drawn to scale that show the nature, location, dimensions and elevations of the areas in question, existing or proposed structures, fill, storage areas, and drainage facilities.

If managed and enforced properly, the Local Law for Flood Damage Reduction can accomplish the following: protect human life and health; minimize public expenditures for costly flood control projects; minimize the need for rescue and relief efforts and public costs for same; minimize prolonged interruption of business; minimize damage to public facilities and utilities; help to maintain a stable tax base by properly using flood hazard areas so to minimize future "flood blight areas"; provide that developers are notified of flood hazard areas; and, ensure property owners in flood hazard areas assume responsibility for their actions.

As the Local Law for Flood Damage Reduction is designed to comply with the requirements of the National Flood Insurance Program, any changes proposed to the model should first be reviewed by the municipal attorney, the NYS Department of Environmental Conservation, the NYS Department of State, and/or FEMA prior to adoption. NYS Department of Environmental Conservation and FEMA must be provided a list of any changes at the time of filing.

The following table summarizes the presence of basic components and mapping associated with the Local Flood Hazard Mitigation Laws for communities within the Steele Creek Basin.

Table 9: *Local Laws for Flood Damage Reduction*

Municipality	Most Recent Local Law	Date of Maps	Multiple or Single Panel Map	Local Administrator	Application Fee	Appeals Board
Ilion (V)	8/11/99	9/8/99	Single	CEO	No reference	ZBA
German Flatts	3/25/87	5/15/85	Multiple	CEO	No reference	Town Board
Columbia	1996	7/16/82	Multiple	CEO	$100	Town Board
Litchfield	10/13/92	5/7/01	Multiple	CEO	$25	Town Board of Appeals
Winfield (T)	10/11/89	7/3/85	Multiple	Zoning Officer	No reference	ZBA
Frankfort (T)	3/30/01	12/20/00	Multiple	CEO	$10-$15/sq ft	ZBA

Note: CEO = Codes Enforcement Officer
ZBA = Zoning Board of Appeals

Local Land Use Management – Land use and development can also be managed within the flood hazard areas via the use of traditional land use controls such as zoning, comprehensive planning, subdivision regulations, site plan review, and specific ordinances adopted by topic (such as "mobile home" or "erosion control" ordinances).

Perhaps the most common land use control that can be adopted by municipalities is zoning law. Zoning is a vehicle by which a community may impose certain restrictions on the use of private property. A zoning law typically regulates the height and size of structures, the percentage of the lot that may be occupied, the size of yards and other open spaces, the density of population, and the location and use of buildings, structures and land for business, industry, residence or other purposes. To accomplish this purpose, a municipality may divide land within its bounds

into various districts, or zones. Within those districts, the municipality may regulate and restrict the erection, construction, reconstruction, alteration or use of buildings, structures, or land. While the regulations addressing each kind of building and use must be uniform within each district, they may vary from district to district.

It is clear that a municipality's zoning law can play a significant role in determining which land uses may be permitted in a flood hazard area. The following table summarizes the local land use controls relating to floodplain management that have been adopted by the communities within the Steele Creek Basin.

Table 10: *Municipal Land Use Controls Summary*

Municipality	Municipal Planning Board	Comprehensive Master Plan	Zoning Ordinance	Subdivision Regulation	Site Plan Review Law	Mobile Home/Trailer Ordinance	Erosion and Sediment Control Ordinance	Local Wetland Law	Buffering Requirements	Open Space Protection or Overlay Districts
German Flatts (T)	N	N	N	N	N	Y (1972)	N	N	N	N
Columbia (T)	Y	N	Y (2002)	Y	N	Y (2002)	N	N	N	N
Ilion (V)	Y	Y(1965)	Y (1990)	Y (1954)	N	N	N	N	N	N
Litchfield (T)	Y	N	Y (1992)	Y	N	Y	N	N	N	N
Winfield (T)	Y	N	Y (1974)	Y (1973)	Y	Y	N	N	N	Y
Frankfort (T)	Y	Y (1965)	Y (1985)	Y	N	Y	N	N	N	N

As Table 10 illustrates, most of the municipalities within the Steele Creek Basin have enacted some form of "zoning" for local land use control. The Town of German Flatts has no zoning, comprehensive plan, or subdivision regulations and relies only on a Mobile Home Law (1972) to properly manage single mobile home units, parks (2 or more units), travel trailers and camps. Further the Town's Mobile Home Law does not specifically regulate where a mobile home, park or camp can be located in relation to a floodplain. The law focuses on notification and licensing requirements, minimum lot size requirements, parking requirements, and defers sewage issues to the sanitary regulations of the Town and NYS Health Department.

The Village of Ilion (which is the most densely populated community in the Basin and is at the receiving end of many of the flooding problems in the basin) has adopted a comprehensive plan (1965), zoning law (1990), and subdivision regulations (1954). Although somewhat outdated, the comprehensive plan does acknowledge a flooding problem at the confluence of Steele Creek and the Mohawk River but does not discuss flooding in the upper reaches of the basin. The plan recommends that the area adjacent to the Mohawk River should not be developed because of flooding problems. The Village's Zoning regulations generally permit a mix of Office Professional (O-P), Manufacturing (M1), Retail Business (B1), General Business (B2) and numerous residential uses along the creek corridor. One exception is that Mobile Home Parks are not permitted in the districts bordering the creek.

While five (5) of the six (6) communities in the Basin have adopted subdivision regulations four of these communities are in the extreme upper reaches of the Basin. Additionally, with regard to local land use control, subdivision regulations are more limited in scope and purpose than zoning. They empower the municipal planning board to review and approve the plans for all subdivision of land within the community. A subdivision regulation deals with the actual physical development of the site under review. Subdivision regulations generally include construction standards, specifications, and procedures for proposed streets, drinking water supply, sewage treatment and disposal, storm water management and drainage systems, and other appropriate infrastructure improvements. Unlike zoning, subdivision regulations apply uniformly to all lands within the municipality. It should be noted that the specific type and maximum density of uses that are allowed on the land to be subdivided are established by the zoning law, not the subdivision regulations.

Subdivision regulations can insure that the infrastructure necessary for a development is designed and constructed in such a manner as to help protect the floodplain. For example, by requiring the incorporation of sediment control measures as part of a stormwater management system, subdivision regulations can help prevent large quantities of sediment from entering the waterway and depositing downstream.

As a cautionary note, locally adopted subdivision regulations, as discussed above, should not be confused with the review and approval of certain subdivisions pursuant to New York State Environmental Conservation Law (Article 17, Title 15) and Public Health Law (Article 11, Title II). Pursuant to these statutes, the division of land anywhere in the state, for the purpose of residential development, into five or more lots, each lot being five acres or less in area, within a consecutive three year period, is subject to review and approval by the New York State Department of Health. In the case of Herkimer County communities, the State has designated the New York State Department of Health District Office in Herkimer to administer this program.

The State Realty Subdivision Laws have no direct relationship to locally adopted subdivision regulations. Not only may the definition of what is a "subdivision" be different, but the State regulations are much more limited in scope, primarily addressing the adequacy of drinking water supplies and sanitary sewage disposal facilities. As noted above, locally adopted subdivision regulations are far more comprehensive, looking at many design factors well beyond water supply and sewage disposal.

A significant portion of the basin and creek is located within the Town of Litchfield. The Town's Local Law for Land and Building Requirements (1992) is inclusive of rules for building permits, subdivision, and mobile homes. There are few provisions that address Steele Creek and/or flooding issues directly. One important section of the law regarding the installation of septic systems requires that no septic systems be permitted in "swampy" areas with a seasonal or high water table, or within areas subject to flooding (Section 13.2 of the local law). Additionally, no septic systems shall be located within 100 feet of any well, pond, stream or waterway (Section 13.5 of the local law).

In the Town of Litchfield, there is a minimum lot size of 40,000 square feet with one dwelling per lot (Section 11.1a of the local law). There are no zoning districts defined in the land use law and, therefore, mobile homes and mobile home parks may be placed in any area of the town as long as the property owner meets the minimum lot size requirement.

It should also be noted that none of the municipalities within the Steele Creek Basin have enacted a separate sediment and erosion control ordinance – nor have they incorporated adequate sediment and erosion control requirements in any of the existing regulations. This may be a notable program gap in the Steele Creek Basin since erosion and sediment has been identified as a significant contributing factor to ice formation, ice jamming, and flooding.

The implementation and enforcement of local regulations may also be a gap in floodplain management in the Steele Creek Basin. Those municipalities within the watershed that may have adopted land use regulations may also have differing expertise, personnel and financial resources. It may not be possible for municipalities to adequately review plans or enforce standards within existing manpower and budgetary constraints. It is important to note that possessing a solid regulation is no guarantee that the regulation will be applied. Therefore, it is necessary that all basin communities have a commitment to applying these regulations in order for the standards to achieve the desired, uniform effect. The regulations must include methods to ensure that adequate review of development occurs and that development plans are implemented as proposed.

Local Policies and Programs – According to the Herkimer County Emergency Management Office, all six (6) of the municipalities in the Steele Creek Basin have developed an "Emergency Operations Plan" for their respective municipality. Each Emergency Operations Plan identifies procedures and provides direction on responsiveness of local officials and guidance to its citizens in the event of a disaster. Each plan includes a structure for mobilization, standard operating procedures, and a specified location for an Emergency Operations Center. The plan lists the responsibilities and functions of the municipal officers, a "chain of command", and identifies other community resources available to address the disaster. The plan also requires that the municipality must keep records and documentation of each emergency to assist in post-disaster recovery.

Most of the Emergency Operations Plans within the Steele Creek Basin contain only the basic, requisite information. In fact, some of the plans require updates – especially in regard to the municipal contacts and their respective responsibilities. The following identifies the year that each plan was last updated: Town of German Flatts (1993), Town of Columbia (1995), Village of Ilion (2003), Town of Litchfield (1994), Town of Winfield (1994), and the Town of Frankfort (2000).

When a disaster becomes too large for a municipality to address with its existing resources, the municipality may request assistance from Herkimer County. Herkimer County also has a Comprehensive Emergency Management Plan that was updated during 2003. The County's plan includes guidance for response, risk management, and recovery. The County is also in the process of developing an "All Hazards Mitigation Plan" that is anticipated to be complete by November 2004.

There are also other informal policies and programs within the Steele Creek Basin. For example, there is an informal program established to monitor and report on the depths and conditions of the Creek during anticipated flooding.

The Town of German Flatts and the Village of Ilion each have respective Memorandums of Understanding (MOU) with the NYS Department of Environmental Conservation that allows certain public works projects in or around streams to be done without the need to obtain individual permits for each project. The MOU's are typically renewable every five years (if the scope of work is not significantly changed). Specific activities covered by the MOU include; "public works that will change, modify or disturb the course of, or necessitate the removal of sand, gravel or other material from," streams in the Town or Village. The MOU outlines very specific conditions that must be met before work can be done.

Additionally, as part of the development of this Multi-Community Flood Hazard Mitigation Plan, communities within the Steele Creek Basin have undertaken additional planning activities that are required as part of the NFIP's Community Rating System (CRS) program. The Village of Ilion currently participates in the CRS Program and is interested in obtaining further benefits from that program.

Community Rating System (CRS) – Part of the NFIP program includes federally supported flood insurance in those communities that participate in the NFIP and regulate development within the designated flood hazard areas. The Community Rating System (CRS) provides for a reduction in those flood insurance premiums in those communities that do more that is minimally required as part of the NFIP program. Communities participating in the CRS program can obtain credit points based on additional flood hazard mitigation activities that are implemented (See Appendix D for further information on the CRS program).

As an example, the Village of Ilion had 214 flood insurance polices in effect at the end of 2003 that protected over $11 million in property. Total flood insurance premiums for the Village during that time totaled approximately $87,000.

During 1999 the key communities within the Steele Creek Basin formally joined together to create the Multi-Community Working Group. Many of the activities undertaken by this group and as part of the development of this Flood Hazard Mitigation Plan, will qualify these Steele Creek communities for additional reductions to flood insurance premiums under the CRS program. Many of the communities propose to make formal application under the CRS program following the adoption of this plan.

Local Structural and Physical Projects – Because of the extensive history of flooding on the Steele Creek, many of the communities in the basin already contain various flood control structures or physical projects that were constructed to help alleviate flooding impacts. These structures include: levees/berms; rip-rap; retaining walls; channelized stream

sections; elevated or flood proofed structures; dams and weirs; and/or other stream bank stabilization projects. The local structures and physical projects are identified on Figure 6 - “Local Flood Related Structures”.

In comparison to the Moyer Creek and Fulmer Creek basins, the Steele Creek basin (especially within the Village of Ilion) contains the highest number of these structures. There are many stream sections that include concrete retaining walls and pass beneath historic stone arch bridges. According to the US Army Corps of Engineers study, " From the Main Street Bridge upstream to the Otsego Street Bridge, the channel is highly confined with trees, concrete walls, and houses extending right up to the channel banks on both sides. Immediately upstream of the Otsego Street Bridge, the channel takes a right angle bend with an ogee crest weir just upstream. The channel slope is milder upstream of the weir and slightly perched above the surrounding floodplain.”

Many of these older projects constrict or narrow the stream channel and may be contributing to flooding and ice jamming events. Of particular note are the channelized areas near the Main Street bridge and E. River Street, and the stone arch bridge on Otsego Street. The US Army Corps of Engineers is considering potential stream grade improvements near E. River Street. However, the Corps is unable to include improvements to the Otsego Street bridge within the Flood Feasibility Study because the bridge is thought to be an historic structure and is managed by the NYS Department of Transportation.

The construction of NYS Route 5s has altered the floodplain of the Mohawk River in the northern most area of the Village of Ilion. The old railroad grade and the Route 5s embankment, have influenced flooding in certain areas of the Village. At times, the Route 5s embankment has prevented flooding of the Mohawk River from impacting areas south of the highway. However, both the Route 5s and railroad embankments have, at times, backed up floodwaters from the Steele Creek on the south side of these embankments.

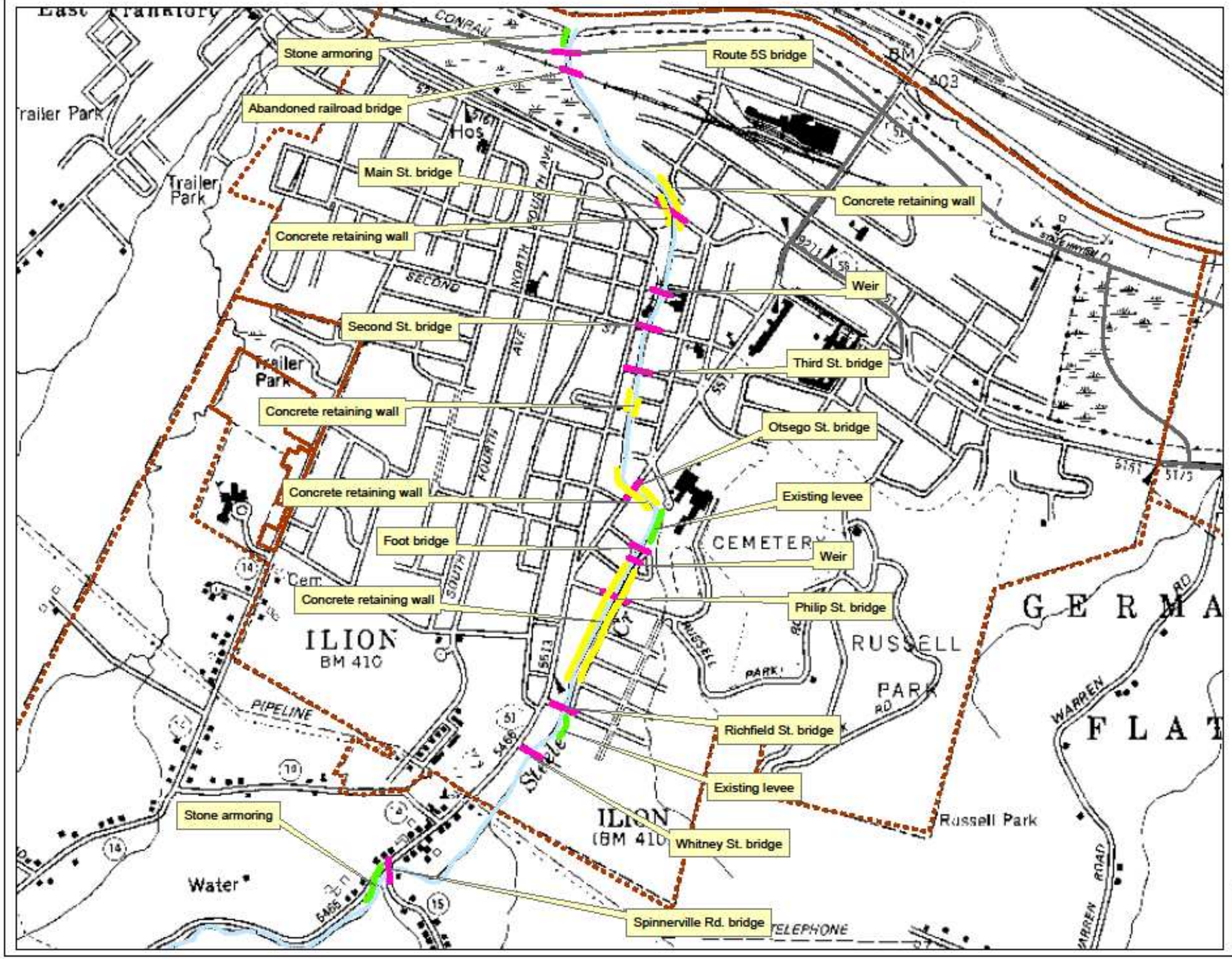
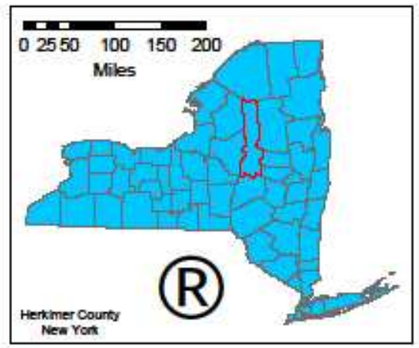


Figure 6
Local Flood Related Structures

0 250 500 1,000 1,500 2,000
Feet
Scale: 1 inch = 1,000 feet

Legend
- Municipal Boundaries
- State Route 5S
- Steele Creek

DOT Planimetric Quadrangle Basemap



5.2 - State and Federal Agency Efforts and Program Gaps

In addition to the activities initiated at the local level, there are many additional programs and activities provided at the State and Federal levels. The following text briefly outlines the various roles of these agencies. Appendix D provides a more detailed directory of specific state and federal programs, services and agency contacts.

Many State agencies have experience and expertise in addressing community-level flooding problems and often serve as a conduit for making necessary contact with federal agencies on behalf of local governments. Within New York State, the State Emergency Management Office (SEMO), the NYS Department of Environmental Conservation, the NYS Department of Transportation (DOT), the NYS Office of Parks, Recreation and Historic Preservation, the NYS Department of State (DOS), and the NYS Soil and Water Conservation Committee (SWCC) are some of the key agencies that have involvement in flood hazard mitigation programs. Table 11 provides an overview of various state agencies and the potential assistance they may provide with regard to several types of flood hazard mitigation activities.

Table 11: *State Agency Assistance*

	NFIP Coordinator (NYS DEC)	Dam Safety Program (NYS DEC)	NYS EMERG MGMNT OFFICE	NYS DEPT OF TRANS	NYS PARKS	NYS DEPT OF STATE	NYS SOIL & WATER
Elevation Certificate	X						
Map Info	X		X				
Outreach Projects	X		X				X
Hazard Disclosure	X		X				X
Flood Prot. Library	X	X	X		X		X
Flood Protection Assistance	X	X	X				X
Flood Data	X	X	X	X			X
Open Space Preservation					X	X	X
Higher Regulatory Standards	X				X	X	
Low Density Zoning						X	
Flood Data Maintenance	X			X			X
Flooding / Stormwater Management	X	X		X		X	X
Floodplain Management Planning	X		X			X	X
Acquisition and Relocation	X		X				
Retrofitting	X		X				
Drainage Syst Maintenance				X			X
Flood Warning Program		X	X				
Levee Safety		X	X				
Dam Safety		X	X				

Source: Modified from FEMA's CRS Coordinator's Manual, Appendix F

At the Federal level, the key organizations involved in flood hazard mitigation activities include: the Federal Emergency Management Agency (FEMA), the US Army Corps of Engineers, the US Department of Agriculture's - Natural Resource Conservation Service (NRCS), and, to some degree, the National Park Service and the Fish and Wildlife Service. Table 12 provides an overview of various Federal agencies and the potential assistance they may provide with several types of flood hazard mitigation activities. Appendix D should be referenced for a more detailed summary of some of these state and federal agency programs related to flood hazard mitigation.

Table 12: *Federal Agency Assistance*

	FED EMERG MANAGMNT AGENCY	EMERGENCY MANAGMNT INSTITUTE	US ARMY CORPS OF ENG	NATURAL RESOUR CONSERV SERVICE	US GEOLOG. SURVEY	NATIONL. PARK SERVICE	FISH & WILDLF SERVICE	NATIONL. WEATHR SERVICE
Elevation Certificate	X	X	X					
Map Info	X	X	X	X				
Outreach Projects	X		X					
Hazard Disclosure	X							
Flood Prot. Library	X		X	X				
Flood Protection Assistance	X	X	X	X	X			
Flood Data	X	X	X	X	X			
Open Space Preservation				X		X	X	
Higher Regulatory Standards	X	X	X				X	
Low Density Zoning								
Flood Data Maintenance	X		X	X	X			
Stormwater Management	X		X	X				
Floodplain Management Planning	X		X	X		X		
Acquisition and Relocation	X		X	X				
Retrofitting	X	X	X	X				
Drainage System Maintenance	X		X	X				
Flood Warning Program	X		X	X	X			X
Levee Safety	X		X	X				
Dam Safety	X		X					

Source: Modified from FEMA's CRS Coordinator's Manual, Appendix F

National Flood Insurance Program – The primary role of federal and state agencies in flood hazard mitigation and prevention comes in the form of technical and financial assistance. Perhaps the most significant flood hazard mitigation program that involves both state and federal agencies is the National Flood Insurance Program (NFIP). The NFIP is a

program developed at the federal level that enables property owners to purchase flood insurance. Before the NFIP, flood insurance was generally unavailable. The program is based on a partnership between communities and the federal government in which the community adopts floodplain management regulations focused on reduced flood risks and the federal government makes flood insurance available within that community. Nationally, the program is administered by the Federal Emergency Management Agency (FEMA).

If FEMA identifies a community as "flood prone", the community must then decide whether to participate in the flood insurance program. Should the community choose not to participate or if it is suspended from the program for not properly enforcing floodplain management regulations, the community is then "sanctioned". The implications of this are severe. Grants, loans or guarantees that are typically made available by federal agencies such as the Small Business Administration, Federal Housing Administration and Veterans Administration, are prohibited for purchase or construction of buildings or other insurable property in the identified flood hazard area. If a flood disaster situation occurs in a sanctioned community, then no federal disaster assistance will be provided for acquisition, construction, repair or replacement of structures or their contents. Additionally, Individual and Family Grant (IFG) assistance for housing and personal property may not be available

When the community elects to participate in the NFIP program, it agrees to adopt and enforce floodplain management regulations that reduce future flood risks in exchange for having flood insurance coverage available for sale within the community. The NYS Department of Environmental Conservation administers the NFIP in New York State and has a model local law that communities may adopt as floodplain management regulations *(See discussion in Section 5.1)*. The availability of flood insurance at more affordable rates to all citizens of the community is a substantial benefit of program participation. There are additional benefits to be considered. Many communities are furnished a comprehensive and detailed study of the hydrologic and hydraulic aspects of the flooding problems by FEMA, at no expense to the community. These studies provide data that is useful in floodplain and water resources management and other aspects of community planning.

At the local level, the community's building inspector or code enforcement officer is typically the local administrator of the community's flood damage prevention law. However, this may vary as was summarized previously. The law states that a floodplain development permit is required before the start of construction. The application for a floodplain development permit should include plans, in duplicate, drawn to scale and showing the nature, location, dimensions, and elevations of: the area in question; existing or proposed structure; fill; storage of materials; and drainage facilities. The application should also include: the elevation (in relation to mean sea level) of the proposed lowest floor of all structures (including the basement); the elevation (in relation to mean sea level) to which any non-residential structure will be flood-proofed; the elevation in relation to mean sea level of all utilities (except those specifically designed to be placed below the design flood elevation); a certificate from a licensed professional engineer or architect that any flood-proofing meets legal flood-proofing criteria; and a description of any watercourse alteration or relocation. An Elevation Certificate documenting the structures lowest floor, is to be completed by the applicants licensed professional engineer, surveyor, or architect and filed with the local administrator.

The implementation and enforcement of state and federal regulations at the local level may be a gap in floodplain management in the Steele Creek Basin. The municipalities may have different levels of expertise, personnel or financial resources and it may not be possible to adequately review plans or enforce standards within existing manpower and budgetary constraints. However, improper implementation of the National Flood Insurance Program may result in a greater loss of future grants, loans, guarantees and federal disaster assistance.

SECTION 6 – REVIEW OF PROTECTION ALTERNATIVES

Historically, flood protection programs and assistance have been almost exclusively directed toward structural floodplain management alternatives. In recent years, however, the importance of non-structural alternatives has been recognized in insuring a well thought-out, comprehensive flood mitigation program that incorporates both structural and nonstructural flood protection alternatives.

Within the Steele Creek Basin, the US Army Corps of Engineers has focused its efforts on identifying structural mitigation alternatives as part of the federally and state sponsored flood control reconnaissance and feasibility studies. The findings from the US Army Corps of Engineers' study will be presented separately from this Multi-Community Flood Hazard Mitigation Plan.

The Herkimer-Oneida Counties Comprehensive Planning Program, in cooperation with the NYS Department of Environmental Conservation, has focused its efforts on identifying non-structural alternatives as part of this Multi-Community Flood Hazard Mitigation Plan.

STRATEGIES AND TOOLS FOR FLOOD HAZARD MITIGATION

1. ***How can I modify the stream or flood through structural controls?***
2. ***How can I modify the types of land uses and/or structures that are impacted by flooding?***
3. ***How can I prepare for, respond to, and recover from a flood?***
4. ***How can I protect and/or restore the natural resources and functions of the watershed?***

There are many different and proven alternatives relating to flood hazard mitigation. Most often a community first thinks about how to *"modify the stream or its flooding through structural controls"*. However, rather than modifying the stream's flooding, a community should also consider ways to *"modify the types of land uses and structures that are impacted by flooding"*. A community can also undertake a number of preventative activities to *"prepare for and respond to a flooding event"*. And, lastly, a community can work to *"preserve or restore the natural functioning of the floodplain and its natural resources"*. A balanced flood hazard mitigation program that incorporates a mix of alternatives will help the community to meet ALL of its needs – whether those needs are to protect existing development, manage new development, or protect natural resources.

Many of these alternatives, and tools for implementing these alternatives, have been evaluated by the Multi-Community Working Group. The tools of most interest to the communities within the Steele Creek basin, and those that may be the most realistic and practical alternatives for these communities, are discussed below. Additionally, a comprehensive list of alternatives and those alternatives selected by the communities within the Steele Creek Basin are included in Appendix E – Selection of Flood Hazard Mitigation Alternatives.

6.1 - Constructing Projects to Control Flood Waters

Extensive time and effort has been invested in the consideration of ways to *"modify the stream or its flooding through structural controls"*. The US Army Corps of Engineers Flood Control Study for Steele Creek details a very in-depth analysis of structural alternatives for floodplain management in the basin. Primary structural alternatives that were considered include: 1) levees or floodwalls that keep water away from developed areas, 2) channel alterations to make flow dynamics more effective, 3) channel diversions to direct flow around sensitive areas, 4) ice piers, diversions, and associated retention areas that store excess water and ice in upstream areas, and 5) removal of existing flow and channel constrictions. The separately published US Army Corps of Engineers' Flood Control Study should be referenced for more detailed information concerning these alternatives.

6.2 - Managing the Use of Lands

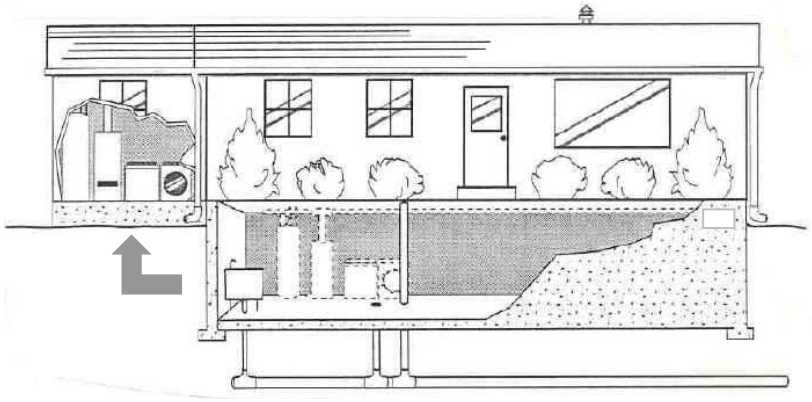
Communities can "*modify the types of land uses or structures that are impacted by flooding*" and can properly manage the use of land in the floodplain to reduce the susceptibility of these uses to flood damages. Managing the use of land is often administered by a municipal building, zoning, planning, and/or code office. However, certain uses of property can also be improved via activities undertaken by individual property owners. Tools commonly used to accomplish the management of lands within a floodplain include:

♦ **Local Land Use Controls** - These controls may include local regulations to manage development and/or steer development away from flood prone areas, environmentally sensitive areas, or other areas deserving protection. Potential land use controls may include specific requirements such as: density requirements that encourage large lots within the floodplain; subdivision regulations that establish adequate site design criteria; setbacks and buffering to maintain open space areas and natural drainageway functions; critical area protection or overlay districts to protect wetlands, floodplains, areas of ice jamming, areas of erosion, etc. Local land use controls might also focus on stormwater management, establishment of drainage systems, land easements, and maintenance of these areas.

♦ **Development policies** – Communities can also create specific development policies and design guidelines such as those that promote open space and recreational uses in floodplain. Guidelines may also be developed to assist in the proper siting and location for essential facilities and utilities. Commonly, a community's development policies are outlined in the Community Master Plan or Comprehensive Plan.

♦ **Acquisition/Relocation** – Often communities must address flooding concerns in areas that are already developed. In these circumstances, it may be useful to identify parcels and/or buildings where purchase, relocation or demolition is a viable option. An acquisition or relocation program can be developed to identify high priorities such as the systematic purchase of repetitive loss property.

♦ **Flood proofing and Retrofitting** – Whether in developed areas or newly developing areas, communities can also manage the use of lands by requiring flood proofing on new buildings and retrofitting of existing buildings. There are various options for flood-proofing that may include the elevation of structures, "dry-proofing" to keep floodwaters out of structures, and "wet-proofing" that allows water to flow through structures.



An example of a "wet-proofed" home.

6.3 - Preparing for Floods

Communities can modify the impact of flooding by undertaking many preemptive activities that will help individuals to "*prepare for, respond to and recover from floods"*. These measures are typically the responsibility of each municipal government, planning board/zoning board, and/or emergency management staff. Tools commonly used as preemptive efforts include:

♦ **Flood Hazard Planning** – Clearly, the development of this Multi-Community Flood Hazard Mitigation Plan will help the communities to identify and implement activities that can be undertaken **prior** to a flooding event.

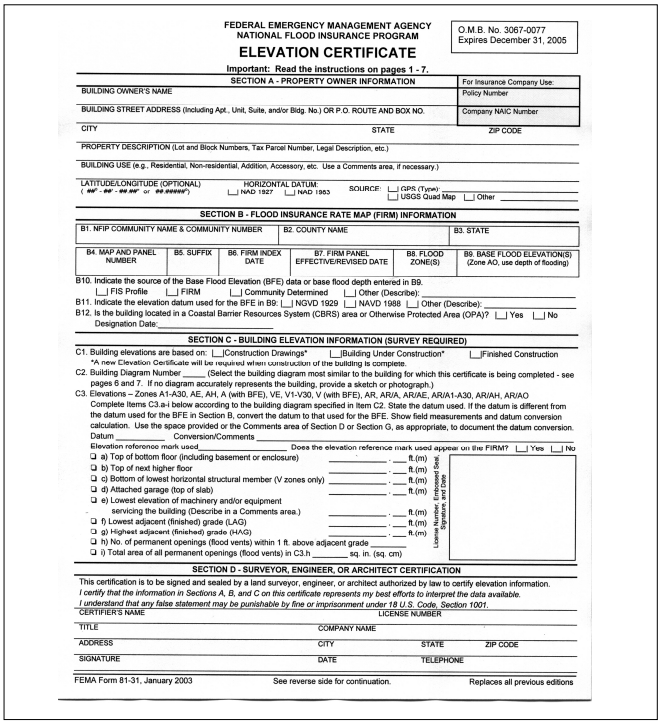
A community can establish an "Early Warning System" to predict and warn residents of an impending flood. A recent example of such an early warning system can be found in Schoharie County, New York. Here the State and County governments have developed a system (known locally as the "reverse 911 system") where residents in the Schoharie Creek basin receive telephone message alerts when floods are likely to occur in their particular location. The alert message is activated based on stream gage readings in upstream locations.

Once a flood has occurred, a "Flood Response Plan" may help to more rapidly return the community and businesses to pre-disaster conditions. A post-disaster recovery plan and program may involve physical or structural projects that are activated during flooding events. For example, a method for filling, locating, and constructing sand bag levees may be included in a response plan. A flood response plan may define specific responsibilities and services that can be shared among affected communities to avoid duplication during a flood event. Coordination of public works crews from various affected communities and defined roles and procedures for post-disaster clean-up will maximize their effectiveness. Consideration should also be given to establishing criteria and a method for determining road and bridge closings. It is important that one community does not rely on one road as an evacuation route that the adjoining community has closed.

♦ **Public Outreach and Education** – Public education and outreach activities can play a significant role in reducing flood damages and protecting lives. Public information activities advise property owners, potential property owners, and visitors about the potential hazards and ways to protect themselves against the hazards. A community can develop and distribute brochures or other information relating to flood mitigation planning and can establish a technical assistance program to assist residents on flooding issues. It is also helpful for a community to maintain necessary information and mapping to be available for public viewing. Some communities have developed and promoted an on-going community-training curriculum. The most common activities undertaken by flood-prone communities are those public outreach and education activities suggested within the National Flood Insurance Program's Community Rating System. The Community Rating System program encourages outreach and education activities that, if completed, result in cost reductions in flood insurance. Other types of outreach and education activities involve requirements for real estate disclosure when a property within a flood hazard area is being offered for sale.

♦ **Record Keeping** – The development, inspection and maintenance of municipal records are important – especially in post-disaster recovery and claims. A record of building permits assists in determining recent structural improvements. Elevation certificates include information such as street location, first floor elevations, and adjacent grade elevations for each structure within the floodplain. Mapping information is also important to a community's efforts to prepare for flooding events.

The NFIP Community Rating System Program requires elevation certificates be maintained for all buildings in the flood hazard area. Additional credit is received in the CRS program if elevation certificates are maintained for buildings constructed before the CRS application, if certificates are in digital format, and/or if elevation certificates are maintained for buildings



FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

BUILDING OWNER'S NAME | For Insurance Company Use: | Policy Number | Company NAIC Number

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.

CITY | STATE | ZIP CODE

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.## or ##.######) HORIZONTAL DATUM: ☐ NAD 1927 ☐ NAD 1983 SOURCE: ☐ GPS (Type) ☐ USGS Quad Map ☐ Other

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other (Describe):
B11. Indicate the elevation datum used for the BFE in B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe):
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No
Designation Date:

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.
C2. Building Diagram Number ____ (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)
C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.
Datum _____ Conversion/Comments _____
Elevation reference mark used _____ Does the elevation reference mark used appear on the FIRM? ☐ Yes ☐ No
☐ a) Top of bottom floor (including basement or enclosure) _____ . ___ ft.(m)
☐ b) Top of next higher floor _____ . ___ ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) _____ . ___ ft.(m)
☐ d) Attached garage (top of slab) _____ . ___ ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area.) _____ . ___ ft.(m)
☐ f) Lowest adjacent (finished) grade (LAG) _____ . ___ ft.(m)
☐ g) Highest adjacent (finished) grade (HAG) _____ . ___ ft.(m)
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade _____
☐ i) Total area of all permanent openings (flood vents) in C3.h _____ sq. in. (sq. cm)
License Number, Embossed Seal, Signature, and Date

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME | LICENSE NUMBER
TITLE | COMPANY NAME
ADDRESS | CITY | STATE | ZIP CODE
SIGNATURE | DATE | TELEPHONE

FEMA Form 81-31, January 2003 See reverse side for continuation. Replaces all previous editions

constructed before the initial date of the Flood Insurance Rate Map (FIRM). Similarly, additional CRS credit is received if a community maintains record of current and past versions of Flood Insurance Rate Maps.

Records regarding structures within the floodplain are also helpful to local realtors, lending institutions and prospective home buyers.

♦ **Financial Planning** – Proper financial planning by affected communities is important to reduce the financial impact caused by flooding. The inclusion of flood hazard mitigation activities in the development of local capital improvement programs can allocate public expenditures to reduce the impacts of future floods. In the event of a lack of state or federal financial assistance, capital improvement programs may set aside needed funding for modifying bridge heights and/or widths, widening or replacing culverts, or the development of hazard mitigation facilities such as ice control piers and stormwater detention facilities. Proper financial planning may also provide the matching funds that may be required as part of Federal and State grant programs.

A community may also choose to assess "impact fees" for development that would negatively affect drainage within the watershed. This tool generally serves as a disincentive to property owners who build in flood hazard areas but may also provide a source of revenue that the community can rely on to undertake capital improvements relating to drainage and flooding issues. While this financial tool acts as a disincentive to property owners, there are other tools that provide financial incentives to property owners. For example, communities can implement tax adjustments and credits to encourage property owners to leave their land in an undeveloped/natural state. Caution should be used by a community when proposing "impact fees" to insure that proper enabling legislation is used as the basis for establishing the special district.

Within NY State, stormwater management districts (referred to as "drainage districts") may be formed under Town Law Article 12 or Article 12-A. Towns may undertake drainage improvements in discrete areas of the town without forming improvement districts as enabled in Town Law Article 12-C. Cities and villages may not form special improvement districts under these statutes. However, Counties may establish drainage districts that include parts or all of cities, towns and villages within the county (County Law Article 5-A). Other potential options may be available for "inter-municipal agreements" (GML Section 119), creation of a commission via special state legislation, formation of a not-for-profit corporation, etc.

An important responsibility of each community is the identification of, coordination of, and application for various types of financial assistance that may be available for both pre and post disaster activities. Consideration should be given to looking beyond the traditional types of disaster assistance when implementing hazard mitigation activities. While Section 5.2 outlines many state and federal programs relating to flood hazard mitigation, many other financial assistance programs and grants exist that could relate to projects and activities desired by the affected community. It is also important to coordinate activities with adjoining communities and their objectives.

Perhaps the best financial planning is the availability of flood insurance to individual property owners. It is important for local governments to invest some effort in convincing its property owners that insurance provides a benefit to facilitate disaster recovery. A high percentage of property owners having such insurance coverage may also serve to illustrate the community's commitment to hazard mitigation – thus helping to obtain more financial assistance.

The NFIP Community Rating System is an important tool that can be implemented by local governments to obtain reduced insurance rates for its property owners.

6.4 - Preserving and Restoring Natural Resources

A community can also undertake natural resource protection activities that "preserve and restore the natural areas and functions of the floodplain" and watershed. Many of the tools discussed above (such as tax incentives or land use regulations that protect flood plains and open space areas) provide many of the benefits directed at the preservation and protection of natural resources. Additional strategies and tools are noted below. These tools are typically implemented by the municipal government but can be significantly supported by parks, recreation and conservation agencies and existing programs.

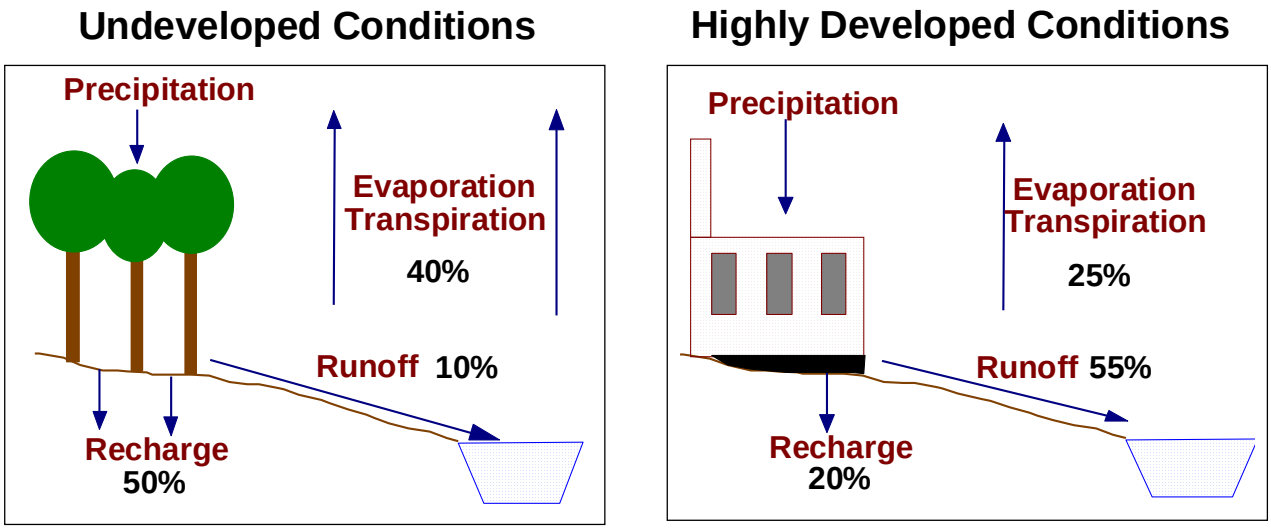
♦ **Wetland Protection and Enhancement** – Wetlands provide many functions within a watershed and are often thought of as a "sponge" that can soak up and detain excess water from storm events. The State and Federal governments protect and map wetlands regulated under current law. However, small "unregulated" wetland areas can also be valuable for flood hazard mitigation and open space preservation purposes. Consideration should be given to the value and linkage of wetland areas to: 1) flood hazard mitigation, 2) open space protection, 3) as detention or diversion areas for structural flood control projects, and 4) as recreational areas. A community may choose to map all wetland areas within the watershed and incorporate more stringent wetland protection measures into local land use controls.

If wetland areas have been significantly modified or are otherwise not providing for flood retention/detention to their optimum capacity, a community can also consider wetland enhancement or wetland restoration projects and programs.

♦ **Stormwater Management** – The management of stormwater is also important in a community's efforts to reduce flooding. As a community is developed, this results in more impervious surfaces (such as paved parking lots, roads, and buildings). This condition reduces the amount of water filtering into the ground and causes an increased amount of runoff. To reduce this effect, a community can develop a stormwater management program to regulate pre-development and post-development conditions.

In New York State, some communities are currently required to obtain a State Pollution Discharge Elimination System (SPDES) permit relating to the management and discharge of stormwater within their boundaries. While the communities in the Steele Creek Basin are not currently required to obtain such a permit, they may choose to voluntarily implement a similar stormwater management program based on the Phase II Permit guidance provided by NYS Department of Environmental Conservation.

It should also be noted that while the communities in the Steele Creek Basin are not currently required to obtain such a permit, the Phase II Stormwater Permitting Program does require developers and contractors who disturb more than 1 acre of land to manage pre-development and post-development stormwater discharges in these areas.



♦ **Erosion and Sedimentation Control** – It is a natural process for streams to "cut" into the outside curve of meanders and transport materials downstream. However, removal of vegetation and/or the constriction of stream channels can exacerbate the rate of erosion. One of the primary causes of flooding in the Steele Creek basin relates to the deposition of sediment and gravel in shallow or constricted areas and the subsequent ice jams that occur in these locations. Section 4.4 notes the areas of significant streambank erosion on the Steele Creek.

Tools commonly used to control erosion and sedimentation typically include structural controls (such as streambank stabilization through the use of stones, rip-rap, and/or vegetation) and non-structural controls (such as an erosion and sediment control ordinance).

Land use regulations and/or overlay districts can be established to create buffer areas along streams that may help to reduce erosion and sedimentation. NYS has a model erosion and sediment control ordinance that outlines standards and specifications to reduce erosion and sedimentation

♦ **Open Space Planning** – As discussed in Section 4.5, open space areas of concern in the Steele Creek Basin include parcels that are currently vacant and undeveloped. Significant benefit may be obtained in keeping vacant parcels in the floodplain open. This can be accomplished by keeping or placing the lands in public ownership (i.e. parks and recreation areas), keeping it as a public or private conservation area (i.e. sportsman's club, conservation area, or wildlife area), or by imposing additional land use regulation (i.e. deed restrictions, zoning, clustering, etc).

♦ **Preservation and Maintenance of Natural Drainageways** – Streams and drainageways that are kept clear of development and debris may help to maintain the natural flood carrying and storage capacities. A community can establish a program to maintain natural drainageways, clear channels, and establish a routine inspection and maintenance program of both "natural" and man-made drainageways.

SECTION 7 - RECOMMENDATIONS

As discussed in Section 6, there are many alternatives for flood hazard mitigation that were categorized under four general topics including: 1) modification of the floodplain through structural controls, 2) modification of the uses of lands within a flood hazard area, 3) preventative activities to prepare for and respond to a flooding event, and 4) the preservation or restoration of the natural functioning of the floodplain and/or its natural resources. These same four categories were used to group specific project recommendations.

Through the efforts of the Multi-Community Working Group and involved agencies, the following recommendations have been identified as providing a balanced mix of alternatives that are cost effective, reasonable and feasible within the Steele Creek Basin. These recommendations are summarized in Appendix E – Selection of Flood Hazard Mitigation Alternatives and Appendix F – Summary of Flood Mitigation Action Items.

The following projects and activities include: A) a summary of specific project recommendations; B) an identified prioritization at the time this Plan was developed; C) an action plan or proposed schedule of when the projects/activities should be undertaken; and D) a description of how the project might be implemented. However, it will be necessary for the Multi-Community Working Group to regularly revisit these recommendations and adjust priorities and schedules accordingly. As with many other plans, this Flood Hazard Mitigation Plan is envisioned to be an ever-changing document and process that incorporates new ideas and revisions as conditions fluctuate.

It is assumed that, unless otherwise noted in the following recommendations, that the village and/or towns within the Steele Creek Basin will take the lead and will be responsible for implementing specific recommendations.

The "Comparative Prioritization" is a rating factor included in each project recommendation that is based on a generalized scale including "high", "medium" and "low". This prioritization includes a suggested importance of the specific project in relation to other projects that are recommended in the plan. The "Required Expenditures" indicates a very general estimate of the amount of time, resources and/or funding that may be required to fully implement the project. The "Required Expenditures" factor is based on a scale including "minimal" expenditure, "moderate" expenditure, or "high" expenditure.

7.1 - Constructing Projects to Control Flood Waters

The US Army Corps of Engineers began a structural flood control feasibility study for Steele Creek in 1998 under the authority of the Flood Control Act of 1948 (PL80-858) as amended. The objective of the study was to evaluate various structural control measures to reduce damages from fluvial and ice jam induced flooding.

Although the US Army Corps of Engineers has evaluated a number of structural control alternatives, not all of these alternatives will meet the minimum federal criteria for further implementation. There are many technical, environmental, cultural, economic, regional, social and institutional constraints that may limit the Corps ability to undertake possible solutions. For example, the project plans must be economically justifiable - that is, benefits must exceed project costs.

Structural control projects that were initially considered by the and/or other agencies but were not selected as part of the US Army Corps of Engineers NED Plan are summarized below for the purpose of offering the communities various structural alternatives that could be implemented regardless of the potential participation from the US Army Corps of Engineers.

RECOMMENDATIONS:

1. **Improve Bridge Flow Capacity:** Both the US Army Corps of Engineers and the NYS Department of Environmental Conservation have suggested that the flow capacity under the Otsego Street bridge, 2nd Street bridge and 3rd Street bridge should be increased to allow for the passage of flood flows. According to these agencies, historical evidence suggests that the bridge openings have been significantly reduced due to sediment deposition. In addition to constricting flood flows, these areas are prone to ice jamming. Because of the difficulty in modifying historic structures, it may be more practical to increase the flow capacity by lowering the creek bed via dredging of sediment. If the creek bed is dredged to its historic grade, a sediment basin up stream should be considered for future sediment control (see "Sediment Control" below).

   Comparative Prioritization: High
   Required Expenditures: Moderate
   Projected Schedule: 2005 and on-going
   Considerations for Implementation: Dredging of the creek bed and maintenance of a sediment basin would require annual maintenance. Detailed bridge abutment data (depth of footings, historic grade, etc) must be obtained to adequately evaluate potential limitations on channel regrading depths and potential scour of bridge abutments. Information on depth of utility crossings and potential impacts to fisheries would also be required.

2. **Sediment Control:** Steele Creek has been subject to extensive alluvial deposition problems. These problems have contributed to the silting in of various channel sections and bridge openings and are one of the major causes of ice jam events. To reduce sediment loading in downstream areas, sedimentation basins should be considered for installation in the up-stream reaches of the basin where undeveloped land is more available. Designated and easily accessible areas that are pre-designed to catch sediment will aid in the need for continued removal of sediment and maintenance. As part of "sediment control", communities should also consider "prevention" of sediment. The stabilization of "severe" stream bank erosion areas (See Section 4.4 – Erosion and Sedimentation and Section 7.4 – Recommendation 3) should be part of the sediment control program.

   Comparative Prioritization: High
   Required Expenditures: High
   Projected Schedule: 2005 and on-going
   Considerations for Implementation: The USDA NRCS, SWCD, NYS Department of Environmental Conservation and US Army Corps of Engineers are the primary agencies that typically address sediment control and streambank stabilization projects. However, certain projects may not adequately "fit" within the scope or criteria of many of these agencies' existing programs. For example, certain agencies may only get involved if the project is large-scale or if the project shows the desired cost/benefit ratio. Because of this potential problem, the basin communities should also consider ways to finance such activities on a continuing basis (See Section 7.3, Recommendation 7 below). When undertaking a sediment control program, the basin communities must also consider completing a more in-depth evaluation of the potential impacts that certain projects may have on the downstream areas. Sediment transport will also need to be modeled.

3. **V-notch channel:** It is recommended that the community continue investigate the feasibility of developing a low-flow channel or v-notch in the concrete channel near the Main Street bridge. The v-notch channel acts to constrict low-flow water to a higher velocity channel under potential ice jams. The notch may also serve to lower the water level enough so ice or other objects do not catch on the Main St. Bridge.

   Comparative Prioritization: High
   Required Expenditures: Minimal
   Projected Schedule: 2005 and on-going

Considerations for Implementation: The design of this measure requires detailed engineering study. Potential fisheries impacts must be coordinated through the NYS Department of Environmental Conservation. The community must also consider the cost of ongoing maintenance associated with this alternative.

4. **Wall Extension:** Another structural control alternative suggests lengthening the retaining wall on the east bank of Steele Creek in a location north of the Main Street Bridge, beyond the electric sub-station, to the abandoned railroad bed As pointed out by the US Army Corps of Engineers , the substation does not currently have a perimeter berm for flood protection.

   Comparative Prioritization: High
   Required Expenditures: Moderate
   Projected Schedule: 2005 and on-going
   Considerations for Implementation: In considering this potential project, access points to the Creek should also be maintained so that local officials can access the creek bed to perform any needed maintenance and/or ice removal. Hydrologic and hydraulic analysis would be necessary. Close coordination is required with the Ilion Board of Light Commissioners regarding potential future expansions at the facility and safety precautions.

5. **First Street Dam Removal:** It is recommended that the small dam behind the Catholic Church near First Street be removed and the channel regraded to reduce potential ice jamming and restore the historic grade of the creek bed.

   Comparative Prioritization: Low
   Required Expenditures: Moderate
   Projected Schedule: 2007
   Considerations for Implementation: Detailed engineering is required to determine the length and depth of channel regrading. A study of the potential impacts to fisheries would also be required.

6. **Abandoned Railroad Bridge:** The US Army Corps of Engineers suggests that the abandoned railroad bridge near Route 5s may constrict flood flows and is the site of frequent ice jamming. The removal of this bridge and regrading of the adjoining embankments may improve flood flow capacities under this bridge.

   Comparative Prioritization: Low
   Required Expenditures: Moderate
   Projected Schedule: 2007
   Considerations for Implementation: There are discussions regarding the potential use of this bridge as a pedestrian bridge for the Canalway Trail improvements. Close coordination is required between the railroad, NYS Canal Corporation and the NYS Department of Environmental Conservation.

7. **Water Supply Reservoirs:** A 1996 memo from NYS Department of Environmental Conservation staff suggests an examination of the potential use of the Ilion Water Supply Reservoirs (especially Reservoir #3) for flood storage and timed release. All of the Water Supply reservoirs are located within the Town of German Flatts and could potentially help to manage runoff from these fairly large sub-basins.

   Comparative Prioritization: Low
   Required Expenditures: Low
   Projected Schedule: 2007
   Considerations for Implementation: Detailed flow data and gauging would be required in these sub-basins to determine the potential benefits for flood storage.

7.2 – Managing the Use of Lands

As discussed previously, the communities within the Steele Creek basin can properly manage the use of land in the floodplain to reduce the susceptibility of these uses to flood damages. Such tools can include: land use regulation; development policies, acquisition and relocation activities; or floodproofing and retrofitting activities.

It should be noted that many of the following project recommendations closely parallel and/or link to other recommendations discussed in previous and subsequent sections of this plan.

RECOMMENDATIONS:

1. German Flatts Land Use Controls: As also stated within the Multi-Community Flood Hazard Mitigation Plan for the Fulmer Creek Basin, it is strongly recommended that the Town of German Flatts undertake a program to develop and adopt necessary land use controls that will allow the Town to effectively manage certain land uses in the floodplain areas of Steele Creek. The activity should begin with the development and adoption of a community Comprehensive Land Use Plan. Based on this Plan, the Town can then adopt appropriate land use controls. Updates to the Town's Mobile Home Law are also necessary as the Law does not adequately address the potential location of future mobile homes/manufactured housing in floodplain areas. The NYS Department of Environmental Conservation also notes that the community's Local Law for Flood Damage Reduction should be updated (See Section 7.2, Recommendation 4).

Comparative Prioritization: High
Required Expenditures: Minimal
Projected Schedule: 2004 – 2005 Comprehensive Plan, 2006-2007 Land Use Controls
Considerations for Implementation: Until broader based land use controls are adopted, the Town may wish to consider the adoption of separate ordinances such as for erosion and sediment control (discussed below), stormwater management, etc.. The development of local land use controls should consider management techniques such as low density/large lot development within the floodplain areas, clustering of multiple structures on areas of the parcel(s) outside the flood hazard areas, preservation of open space, site design criteria for subdivisions, and stream buffering. Greenway development and buffering is discussed further in Section 7.4. Provisions for stormwater management should place limits on the amount of impervious surfaces and should include standards for pre- and post-construction runoff conditions. Additionally, consideration should be given to the restriction of individual wells and/or septic systems within flood hazard areas so as to avoid the potential health risks associated with flooding, pollutant transport and drinking water systems. Local land use controls should also consider establishing standards for private bridge crossings, driveway culverts, set-backs from streams, etc. The HOCCPP, Department of State, or a planning consultant are the individuals that typically lend assistance in the development of local land use controls.

2. Stormwater and Erosion Control Ordinance: None of the municipalities within the Steele Creek Basin have enacted a separate stormwater and/or erosion control ordinance – nor have they incorporated adequate stormwater and erosion control requirements in any of the existing land use regulations. This may be a notable program gap in the Steele Creek Basin since stormwater, erosion and sedimentation have been identified as significant contributing factors to ice formation, ice jamming, and flooding. <u>All</u> communities within the basin should consider adoption of uniform codes for stormwater management, drainage, erosion and sedimentation. Further, the upstream communities such as the Town of German Flatts, Town of Columbia and Town of Litchfield should adopt necessary regulations to insure there is no net increase in stormwater runoff from sites within these Towns.

Comparative Prioritization: High
Required Expenditures: Minimal

Projected Schedule: 2005

Considerations for Implementation: The NYS Department of Environmental Conservation has developed a model stormwater and erosion control ordinance that could be easily adopted by the key municipalities within the Basin. It is anticipated that by 2004-2005, the SPDES Phase II Stormwater Permitting Program will result in the development of newer guidance regarding stormwater and erosion control ordinances. Uniformity in the development and adoption of such an ordinance by multiple communities may lend itself to shared enforcement and implementation of the program throughout the basin.

3. **Set-Backs and Stream Buffers**: All the municipalities within the Basin that include portions of the main channel of Steele Creek (Ilion, German Flatts and Litchfield) should consider incorporating set-back and stream buffering requirements into local land use regulations. Set-back requirements might include at least the 100-year floodplain boundary or a 50 foot setback of all development or land disturbance from the creek's banks. The establishment of vegetative buffers in these areas can help to filter runoff, improve water quality, reduce soil erosion, slow flood and runoff velocities, provide for wildlife habitat, and allow for the development of a greenway corridor along the stream.

   Comparative Prioritization: High
   Required Expenditures: Minimal
   Projected Schedule: 2006

   Considerations for Implementation: The Natural Resource Conservation Service (NRCS) has programs that support the development of many different kinds of conservation buffers – especially as they relate to agriculture on adjoining properties. There are also numerous examples of model ordinances for stream set-backs and buffering available from HOCCPP, the NYS Department of Environmental Conservation, SWCD and NRCS. This activity should be considered in combination with developing a greenway corridor and natural drainageway system along Steele Creek (See Section 7.4 - Preserving and Restoring Natural Resources).

4. **Update of Local Flood Damage Prevention Laws:** The key communities in the Steele Creek Basin - including the Town of German Flatts and the Village of Ilion - all have Local Flood Damage Prevention Laws. The Village's Law is based on the NYS Department of Environmental Conservation's 1998 model law. However, the Town of German Flatt's Law is based on an even older model law from NYS Department of Environmental Conservation. As new flood maps are adopted and communities wish to tighten minimum flood damage prevention standards, these older laws will require update. Specifically the Town of German Flatts' Local Flood Damage Prevention Law needs to: include updated definitions; incorporate issues associated with the NYS Building Code; reorganize and update the sections on "Administration" and "Construction Standards"; specify an appropriate fee for development permits; and update the development application form.

   Comparative Prioritization: High
   Required Expenditures: Minimal
   Projected Schedule: 2005
   Considerations for Implementation: The development of more accurate floodplain mapping during the US Army Corps of Engineers Flood Control Study may provide an opportune time to update FIRM mapping and the associated Local Flood Damage Prevention Laws.

5. **Acquisition/Relocation:** Given that most of the flooding impacts are within the Village of Ilion, the Village should work to develop a systematic approach for potential acquisition and/or relocation of highly prone properties within the flood hazard areas. This activity would include the identification of parcels and buildings where purchase, relocation or demolition is a viable alternative.

   For example, many of the structures in the downtown area, east of the creek to Center Street, are continuously threatened by flooding from Steele Creek. Similarly, properties along the creek from the Otsego Street bridge and south to Spinnerville Gulf Road include many highly vulnerable structures.

The Village of Ilion and Town of German Flatts should also consider the potential for placing restrictions on rebuilding or repairing structures that may be damaged beyond a certain percentage of value (i.e. removal if structurally damaged beyond 50% of assessed value). These communities may also wish to consider the inclusion of an amortization clause into local regulatory controls whereby the most flood prone structures are removed within a designated time frame (i.e. within 5 years).

Comparative Prioritization: High
Required Expenditures: High
Projected Schedule: 2005 - 2006
Considerations for Implementation: It is preferable to have an acquisition or relocation program be voluntary. Both the US Army of Engineers and NYS Department of Environmental Conservation will not use Eminent Domain to obtain or relocate properties for the benefit of a flood control project. However, the local officials may evoke Eminent Domain proceedings if it is deemed necessary.

6. Flood-proofing Program: This Plan has identified specific structures at risk because they are located within the floodplain. Flood-proofing these structures will reduce the level of damage when flooding occurs. The communities should work with these property owners to develop a structured and on-going program for undertaking flood-proofing activities. Local land use controls can require flood-proofing or elevation of new buildings.

Comparative Prioritization: High
Required Expenditures: Moderate
Projected Schedule: 2005 and on-going

Considerations for Implementation: According to a US Army Corps of Engineers publication, "dry floodproofing involves sealing the outside of the building to prevent floodwaters from entering. Dry floodproofing is usually only considered for cases where flood levels are less than a few feet above the base of the building because at higher levels, the pressure of the water (and ice) can collapse walls. Wet floodproofing allows the flood waters to enter a structure while at the same time minimizing damage by relocating utilities such as furnaces or hot water heaters, above the predicted high water levels. Wet proofing can be used where construction of barriers and dry proofing are not feasible".

The communities should note that flood proofing (except for venting) is considered primarily for non-residential structures. However, the communities can act as conduits between property owners and state or federal agencies that may offer technical and/or financial assistance in flood-proofing activities. The communities should also consider various methods for developing a financial assistance or cost-sharing program locally.

7.3 - Preparing for Floods

As discussed in Section 6.3, there are several methods available to help a community prepare for, respond to and recover from a flood. These methods include: a) planning related activities including development of early warning or flood response plans, b) outreach and educational activities, c) maintenance of proper files and records to assist in claims, recovery, and education, and d) financial planning activities to insure funding is available when needed.

The communities within the Steele Creek Basin should first re-read Section 6.3 to familiarize themselves with the many alternatives that are available to prepare for, respond to and recover from a flood. Secondly, the communities should investigate the details of how many of these alternatives may be implemented. For example, participation in the NFIP Community Rating System (CRS) program will include the implementation of a combination of these

activities. Lastly, the communities should recognize that the methods presented in Section 6.3 include only selected alternatives and do NOT include a comprehensive listing. The communities should continue to research other potential methods that may not have been discussed in Section 6.3.

The following recommendations have been provided as a starting point of alternatives that may be cost effective, reasonable and feasible within the Steele Creek Basin.

1. **Stream Gauges, Sensors, and Monitoring:** Because there are no stage gauges on Steele Creek, past efforts within the basin (including the flood control efforts and enhanced flood mapping) have been based on runoff measurements from similar basins in the region. Further, the proportion of rainfall to snowmelt is unknown in these runoff measurements. A series of stream gauges should be established to measure flow volume and velocity specific to the Steele Creek Basin. Additionally, it is important to incorporate precipitation data collected from rain gauges and an analysis of snow pack within the basin. This type of information is important for any flood forecasting, early warning system, modeling, or mapping effort. Forecasting and monitoring reduce damages by alerting homeowners prior to a flood so that they can reduce the impact of the flooding. Similarly, automated temperature sensors can help to verify whether conditions are conducive to ice jam formation and/or breakup.

   Comparative Prioritization: High
   Required Expenditures: Moderate
   Projected Schedule: 2005 planning. 2006 implementation.
   Considerations for Implementation: The NYS Department of Environmental Conservation, and USGS are the primary agencies that typically assist in the development of monitoring and stream gauging programs. Technical assistance should also be sought from the US Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL).

2. **Automated Early Warning:** The enhanced floodplain mapping and GIS information that was developed for use by the US Army Corps of Engineers in hydraulic and hydrologic modeling for the structural flood control study, provides a solid foundation for the potential development of an early warning system ("Reverse 911") similar to the system developed for residents in the Schoharie Creek Basin. The municipalities within the Steele Creek Basin should begin discussions with the NYS Department of Environmental Conservation, SEMO and USGS regarding the development of an early warning system.

   Comparative Prioritization: Medium
   Required Expenditures: High
   Projected Schedule: 2005 and on-going
   Considerations for Implementation: Automated stream gauges and monitoring are a precursor to such an early warning system. Costs for such a system may exceed benefits to the limited number of residents and businesses being flooded in the downstream communities. However, the communities in both the Steele Creek basin and the adjoining Fulmer Creek basin should consider developing a joint early warning system to reduce costs. The NYS Department of Environmental Conservation-Central Office and SEMO have provided assistance in developing the system for the Schoharie Creek Basin.

3. **Update Existing Emergency Management Plans:** As briefly discussed in Section 5.1 – Local Efforts and Program Gaps, most of the Emergency Operations Plans within the communities in the Steele Creek Basin contain only the basic, requisite information. Many of the plans require updates – especially in regard to the municipal contacts and their respective responsibilities.

   Herkimer County has a Comprehensive Emergency Management Plan that was updated during 2003. The County's plan includes guidance for response, risk management, and recovery. At the time this plan was

written, the County was also in the process of developing an "All Hazards Mitigation Plan" to be complete by November 2004.

Comparative Prioritization: Medium
Required Expenditures: Minimal
Projected Schedule: 20045and on-going
Considerations for Implementation: As individual plans are updated, the communities should consider how these individual community plans relate to adjoining community plans within the same basin. Does one municipality's response interfere with the response from an adjoining community? Does one community close a road or bridge that is a primary evacuation route of the adjoining community? Coordination among all communities in the basin is recommended. The municipalities should also investigate the inclusion of other alternative responses to flooding and ice jamming in their emergency plans such as; options for breaking-up ice jams, ice dusting, and mechanical removal.

4. Data Management System: The. municipalities in the Steele Creek Basin would benefit greatly from having all the data and mapping (that was developed as part of the structural flood control study) in a manageable and usable, computerized format. HOCCPP has been working closely with the NYS Department of Environmental Conservation and the US Army Corps of Engineers to develop a system that better organizes and manages data that is typically generated as part of their Flood Control Studies. Additional data, such as digital elevation certificates, building permits, etc can be added to the system as needs may arise.

Comparative Prioritization: Medium
Required Expenditures: Moderate
Projected Schedule: 2005 and on-going
Considerations for Implementation: Both the agencies and communities involved in flood hazard mitigation activities need a way to more easily access multiple data layers that are typically generated as part of flood control studies. The system would house flood hazard area maps, municipal files and documents, certificates, real property data, natural resource data, and would provide a means for data queries and floodplain modeling. There are multiple uses for such a system whether it is US Army Corps of Engineers staff conducting economic analyses in the field, the planning agency developing a community flood hazard mitigation plan, or the community reviewing a proposed development within a floodplain. The state and/or federal agencies may be able to provide the technical and financial resources necessary to develop such a computerized "Data Management System".

5. CRS Participation and Public Education Program: Many of the activities that relate to the preparation, response to and recovery from a flood can be accomplished through participation in FEMA's Community Rating System (CRS) program. Following the anticipated adoption of this Flood Hazard Mitigation Plan, it is STRONGLY recommended that the basin communities continue efforts to participate in, make application to, and/or receive additional benefits/credits from the CRS program. A few of the key elements of the CRS program include the development of a public awareness and education program, a hazard disclosure program, and improved record keeping.

Comparative Prioritization: High
Required Expenditures: Moderate
Projected Schedule: 2005 and on-going
Considerations for Implementation: The NY State Emergency Management Office provides assistance to communities interested in participating in the CRS program. Specific "Action Items" in the development of a public awareness and education program should include: the provision of flood information at local libraries; the availability of flood hazard maps and plans maps; the distribution of information through a newsletter and/or direct mailings; disclosure of the presence of flood hazard areas to property owners; and, the implementation of on-going resident workshops on flood-proofing, the NFIP program, property maintenance, and/or riparian law.

The municipalities should also coordinate efforts with local real estate agencies and lending institutions to develop a disclosure program that will inform prospective buyers about properties located within flood hazard areas or those at risk of flooding from events such as ice jams. A disclosure program can be voluntary or can be developed as part of a municipality's local law. The Community Rating System provides extensive guidance in developing such a program and if done accordingly, can earn the community credits under the CRS program.

Another key factor in the CRS program is "Improved Record Keeping" at the municipal level. The development, inspection and maintenance of municipal records is important – especially in post-disaster recovery and claims. Specific Action Items include the maintenance of: building permits that will assist in determining recent structural improvements; elevation certificates that include information such as street location, first floor elevations, and adjacent grade elevations; and mapping information. (See also: Data Management System)

The municipalities should also develop a program for the annual inspection and maintenance of elevation reference markers (i.e. bench marks, etc.). The community should maintain a current list of reference markers and make the list available to surveyors. Many of the existing reference markers in the Steele Creek Basin were identified and confirmed as part of the enhanced floodplain mapping effort and should be used as a basis of the maintenance program.

6. Maintenance Program: It is recommended that communities within the basin look at the existing flood hazard mitigation projects and structures within their municipalities and develop a joint maintenance and inspection program to insure these structures are functioning properly. These structures and physical projects are summarized on Figure 6 and may include: levees/berms, rip-rap, retaining walls, dams, weirs, and/or other stream bank stabilization projects.

Comparative Prioritization: High
Required Expenditures: Minimal
Projected Schedule: 2005 and on-going
Considerations for Implementation: Communities should jointly determine specific responsibilities for maintenance and inspection activities, identify specific structures requiring routine maintenance, develop a schedule for maintenance and inspection activities, and insure adequate funds are budgeted for this activity.

7. Financing and District Formation: In order to accomplish many of the recommendations included within this Flood Hazard Mitigation Plan, the basin communities will need a continuing source of revenue to fund such projects and programs. In addition to continued grant research and applications, it is strongly recommended that the communities within the Steele Creek Basin establish an intermunicipal flooding, stormwater management and/or drainage district. Through this district, fees can be assessed based on such land characteristics as; the size of the parcel; the amount of impervious surface; assessed value; population density; etc. The collection of fees can provide an annual source of revenue that is dedicated specifically to floodplain management, stormwater and drainage issues.

Comparative Prioritization: High
Required Expenditures: Moderate
Projected Schedule: 2005 and on-going
Considerations for Implementation: The communities should consider alternatives in assessing fees such as whether each individual municipality is assessed a fee or whether individual landowners/"users" are assessed a fee. It should be recognized early on in the process that contributions from a municipal budget may continue to compete against other high priority activities at the local level (such as road repair and infrastructure improvements). Setting aside a specific line-item in each municipal budget for floodplain and stormwater management or assessing a direct user fee may help to alleviate these opposing priorities in the municipal budget. Creative techniques for floodplain and

stormwater management financing have been pioneered in other areas of the country. Technical assistance in developing a district or financing entity may be provided by the NYS Department of Environmental Conservation, the NYS Department of State, and/or HOCCPP.

7.4 - Preserving and Restoring Natural Resources

Section 6.4 above provides a summary of selected alternatives that could be applied within the Steele Creek basin to preserve and restore the natural functioning of the floodplain and to enhance or restore the natural resources found there. Many of these alternatives relate to each other and to other types of flood hazard mitigation recommendations. For example, the preservation and maintenance of natural drainageways may relate directly to a stormwater management program developed by a community, to buffering established along the main stem and tributaries, to the establishment of open space and recreation areas, and/or to sediment and erosion control practices. This activity may also relate to, or be accomplished by, other recommendations previously discussed, such as: the development of land use controls, the construction of structural controls, and/or by the types of policies and programs the community adopts.

1. **Wetland Protection and Enhancement:** Although there are relatively few wetlands within the Steele Creek basin of a size to be regulated by the NYS Department of Environmental Conservation, it is recommended that a program be developed to map and evaluate unregulated, smaller wetland areas to determine their potential value as 1. flood hazard mitigation areas, 2. open space areas, 3. stormwater and flooding detention areas, and 4. recreational areas. These areas might also contain the potential to be enhanced (at a relatively low cost) in order to provide expanded value for flood storage.

   Comparative Prioritization: Low
   Required Expenditures: Initially Minimal
   Projected Schedule: 2007
   Considerations for Implementation: Communities can also consider the adoption of specific local land use controls that are more protective of these wetland areas than current NYS Conservation Law.

2. **Open Space and Recreation:** If left undeveloped, the area near the confluence of Steele Creek and the Mohawk River may lessen the economic impacts of future flooding and provide significant value for open space, recreation and wildlife habitat. The Village of Ilion and key agencies should consider the potential public acquisition of surrounding property/easements and the designation of this area as an "open space or recreation area". This action may provide limited flood hazard mitigation benefits (See Sections 7.1-Recommendation 6, and other recommendations in Section 7.4) and may provide an excellent linkage to the NYS Canal Recreationway Trail System. Public fishing access is common in this area.

   Comparative Prioritization: Medium
   Required Expenditures: Moderate
   Projected Schedule: 2005 and on-going
   Considerations for Implementation: Because of the potential multi-purpose benefits that may be gained from the implementation of this recommendation, perhaps a variety of funding sources could be tapped so that one entity is not responsible for the entire cost of development or maintenance of the project. The surrounding communities, NYS Department of Environmental Conservation, SWCD, NRCS, Canal Corporation, and NYS Parks and Recreation should be consulted and involved in discussions.

3. **Streambank Stabilization:** The restoration and stabilization of eroded streambanks will provide a number of potential benefits to the community. Perhaps the most significant is the reduction of sediment that is a contributing factor to ice formation, ice jamming, and flooding. As streambanks are stabilized, additional benefit can be gained by establishing open space corridors in these areas which may also serve as buffers and recreational areas. A long term vision should consider the linkage of streambank stabilization areas via a continuous greenway along the stream corridor (See Recommendation 5 below).

It is recommended that each municipality review the Streambank Erosion Inventory that identifies the site location, type of erosion, severity of erosion and estimated extent of erosion. Each municipality should coordinate efforts with adjoining municipalities and necessary agencies to first address the most "severe" erosion sites within their municipality. If funding or resources are not readily available to address these sites, less severe or smaller sites could be addressed.

Comparative Prioritization: High
Required Expenditures: Minimal to High depending upon site and program assistance.
Projected Schedule: 2005 and on-going
Considerations for Implementation: The USDA NRCS, SWCD, NYS Department of Environmental Conservation and US Army Corps of Engineers are the primary agencies that typically address sediment control and streambank stabilization projects. However, certain projects may not adequately "fit" within the scope or criteria of many of these agencies' existing programs. For example, certain agencies may only get involved if the project is large-scale or if the project shows the desired cost/benefit ratio. Because of this potential problem, the basin communities should also consider ways to finance such activities on a continuing basis (See Section 7.3, Recommendation 7). When undertaking a sediment control program, the basin communities must also consider completing a more in-depth evaluation of the potential impacts that certain projects may have on the downstream areas.

4. Drainageway Maintenance Program: The basin communities should establish a program to maintain natural and man-made drainageways to insure the proper conveyance of flood flows. A drainageway maintenance program should include plans for clearing stream channels in accordance with State and Federal permit requirements, and should include a routine inspection program for all drainageways including streams, tributaries, ditches, culverts and drainage swales.

Comparative Prioritization: Medium
Required Expenditures: Moderate
Projected Schedule: 2005 and on-going
Considerations for Implementation: Close coordination is needed with the NYS Department of Environmental Conservation to insure that potential work within the stream and/or on the bank is done in accordance with standards generally accepted by the NYS Department of Environmental Conservation as part of NYS Environmental Conservation Law (Article 15). Within the Steele Creek Basin, the Town of German Flatts and Village of Ilion are the only communities to have a renewable Memorandum of Understanding (MOU) with the NYS Department of Environmental Conservation that allows certain public works projects in or around streams to be done without the need to obtain individual permits for each project. Other communities within the basin should consider developing similar MOU's with the NYS Department of Environmental Conservation.

Prior to conducting any stream clearing, the community should consider the potential benefit that certain materials on stream banks and debris blockages may provide to reducing the velocities of flood flows. In appropriate areas along the stream corridor, material on banks and blockages within the channel could be left in place if adequate storage and/or diversion is available in adjoining undeveloped property.

5. Greenway Development: A "Greenway" can be developed as a connected series of publicly and/or privately owned properties where certain types of development are limited. The planning, development and implementation of an established greenway throughout the basin can accomplish and support many of the objectives in the recommendations previously discussed. For example, the establishment of a multi-purpose greenway may serve to preserve and maintain drainageways, may steer development away from floodplain areas, may reduce erosion of streambanks and subsequent sedimentation, may provide for undeveloped areas for excess flood storage capacity, may enhance infiltration of flooding and stormwater runoff, may provide for recreational opportunities, and may provide for environmental and habitat enhancements.

Comparative Prioritization: Medium
Required Expenditures: Minimal
Projected Schedule: 2005 and on-going
Considerations for Implementation: Adequate public ownership of lands within the greenway or secured rights-of-way or easements are essential to the success of obtaining desired benefits. The basin communities must coordinate closely to identify desired benefits, consider key locations for the greenway, address ownership and easement issues, identify potential funding sources, and consider various approaches for maintenance and operations. Greenway development can be initiated in a smaller area where there is broad-based public support. Additional segments can be added as support and funding are enhanced.

Within the Steele Creek Basin, specific sites of significance with regard to greenway development include the area near the confluence of Steele Creek and the Mohawk River, property adjoining the school grounds, and properties owned by public utilities (i.e. water supply properties and electric transmission right-of-ways).

SECTION 8 - ADOPTION OF THE PLAN AND EFFECTIVENESS EVALUATION

This Multi-Community Flood Hazard Mitigation Plan was developed primarily in support of the US Army Corps of Engineers Structural Flood Control Feasibility Study. The plan was developed to provide the affected communities with, not only structural flood hazard mitigation alternatives, but with realistic non-structural alternatives, as well.

While the primary purpose of the plan is to compliment the US Army Corps of Engineers feasibility study, the plan may also fulfill requirements for additional uses and hazard mitigation programs. For example, the Multi-Community Flood Hazard Mitigation Plan can be used as a basis for participation of affected communities in the National Flood Insurance Program (NIFP) Community Rating System. These activities are further discussed in Section 5. The plan may also be expanded to meet the minimum requirements of the New York State Emergency Management Office's Multi-Hazard Grant Program. It is important to recognize that, with the potential use of this plan for these many purposes, the process for adoption will vary.

8.1 – Process of Adoption

With regard to the adoption of this plan for the purposes of supporting the US Army Corps of Engineers Flood Control Feasibility Study, the regulations require the following. A Local Cooperation Agreement (LCA) is signed between the Local Sponsor(s) and NYS Department of Environmental Conservation prior to construction. A Project Cooperative Agreement (PCA) is then signed between the Government and NYS Department of Environmental Conservation. Specifically, the language states:

"The Town shall be responsible for preparing a flood plain management plan in compliance with Section 402 of the Water Resources Development Act of 1986, as amended, (33 U.S.C. 701b-12), which requires a Non-Federal interest to have prepared within one year after the date of execution of the PCA, a flood plain management plan. The plan shall be designed to reduce the impacts of future flood events in the Project area, including but not limited to, addressing those measures to be undertaken by the Town to preserve the level of flood protection provided by this Project. As required by Section 402, as amended, the Town shall implement such plan not later than one year after completion of construction of the Project. The Town shall provide an information copy of the plan to the Government and to the State upon its preparation."

With regard to the adoption of the plan for the purposes of the Community Rating System (CRS), the basin communities must document that the plan has been made available for review by the residents, businesses, agencies and organizations affected. The CRS process requires that a public meeting be held at least two-weeks before the submittal of the plan to the community's governing body. The community's governing body can then pass a resolution that formally adopts and supports the plan. The plan can then be submitted with the CRS application that notes where each of the requisite CRS steps were covered. A plan that requests FEMA funding should have a letter of support from the State Emergency Management Office and the NYS Department of Environmental Conservation (as the NFIP coordinator). It is also helpful to obtain support from the specific agencies, organizations and individuals represented on the Multi-Community Working Group. This support can be in the form of a simple resolution from these entities.

8.2 – Schedule for Review and Update

Adoption of the plan by various communities, agencies and organizations is not the last step in the planning process. The Multi-Community Working Group will continue to meet at least twice per year to evaluate the effectiveness of the plan and make necessary modifications. This evaluation will include the following activities. These activities may also meet the requirements of the CRS program regarding an "Annual Evaluation Report".

♦ **Measure of Progress:**

- Review each activity and recommendation in the plan to determine how each is proceeding.
- Identify and report on measurable goals for each activity and recommendation underway (e.g. 500 brochures were distributed, etc.)
- Determine if certain tasks may be behind schedule and why.
- Can more be done?

♦ **Suggested Changes**

- Are there additional activities and recommendations that should be added to the plan as a result of changing conditions?

♦ **Assignment of Tasks:**

- Determine who is to spearhead or implement additional activities.
- Provide specific recommendations to individuals, agencies and organizations responsible for implementation.

♦ **Revised Schedule and Reporting:**

- Set new timeframes and a reporting schedule for when specific activities must be accomplished.

A record of the evaluation will be provided to the community's governing body and will be made available to the public.

APPENDIX A

THE "MULTI-COMMUNITY WORKING GROUP"

(Not available in PDF Format)

APPENDIX B

HISTORY OF FLOODING EVENTS IN THE STEELE CREEK BASIN

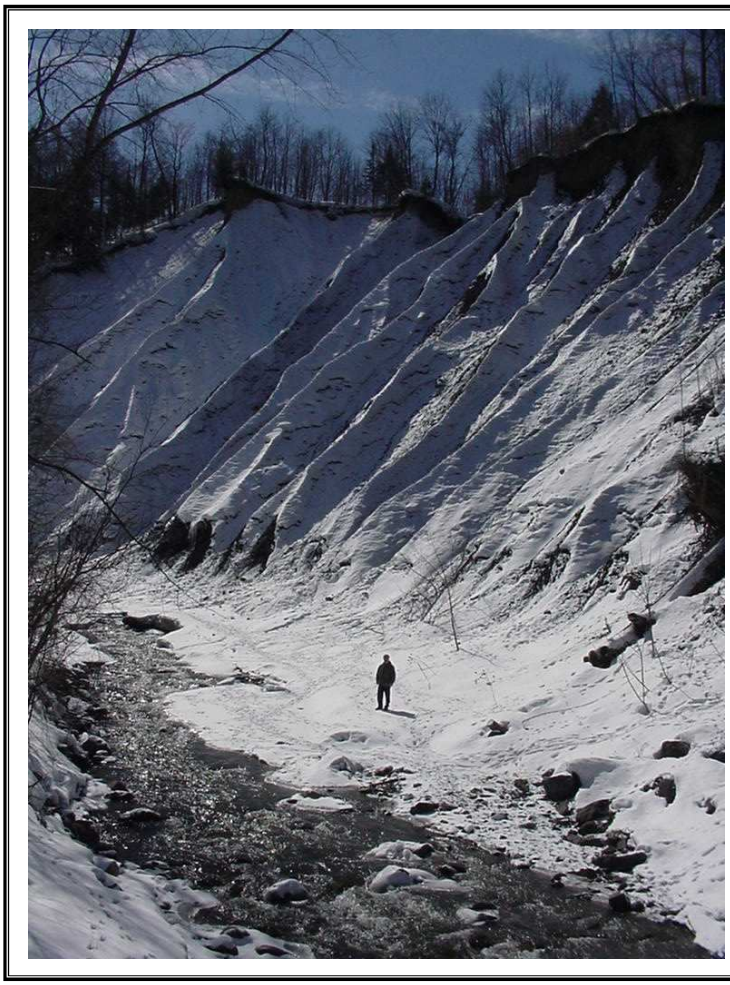
DATE	TYPE/INFO SOURCE	IMPACTED AREA/DAMAGES
1910, 1913 and 1914	ACOE Flood Plain Info	No further information available
June 11, 1922	ACOE Flood Plain Info	18% of Village inundated and Philip and Whitney St bridges were destroyed.
February 13, 1971	Flood	Misc roads closed as a result of rain and snowmelt.
June 29, 1982	Flood	Sand bags at Otsego St brdg/5 ft above arch
February 17, 1983	Ice Jam	High pressure hoses used to clear Rt 51 bridge
September 4, 1984	Newspaper	Clean-up of Ilion Gorge Rd 3 miles south to Ilion.
August 29, 1985	Newspaper	Small City's Grant for retaining wall project
1988	Newspaper	Sand bags needed at Otsego St bridge
1988	Misc Correspondence	Rt 51/Otsego St bridge potential for overtopping
December 8, 1994	DEC Correspondence	Drainage/flooding on Weston Property, North St
February 9, 1996	ACOE Correspondence	Funding authorized for Feasibility Studies
January 19, 1997	Ice Jam	Small jam at Main St bridge
January 23, 2000	Ice Jam	Flood watch declaration
		6 feet of ice build up on creek bed from Main St to Philip and English St.
		Water flowing out of manholes - English St
		Grader used to clear creek bed

APPENDIX C

STREAMBANK EROSION INVENTORY

STREAM BANK EROSION INVENTORY
for
FULMER CREEK, MOYER CREEK, AND STEELE CREEK

Herkimer County, New York



COMPLETED BY:

The Herkimer-Oneida Counties Comprehensive Planning Program
The Boehlert Center at Union Station
321 Main Street
Utica, New York 13501

March 28, 2003

INTRODUCTION

The Herkimer-Oneida Counties Comprehensive Planning Program (HOCCPP) undertook an inventory of the Fulmer Creek, Moyer Creek, and Steele Creek watersheds on March 28, 2003 in an effort to provide additional information to federal, state and local agencies regarding areas of stream bank erosion. This information may be used by the US Army Corps of Engineers to evaluate the potential relationship of erosion and sedimentation on the structural flood control alternatives considered in the Corps' Feasibility Studies for these three basins. The erosion inventory will also be used by HOCCPP as part of the consideration of non-structural flood hazard mitigation alternatives discussed in the "Multi-Community Flood Hazard Mitigation Plans".

Given the fact that three primary roads closely parallel each of the creeks, the stream bank erosion inventory was conducted by HOCCPP via a windshield survey. As the inventory was completed, various sites were characterized as having "severe", "moderate", or "slight" areas of stream bank erosion. These categories were developed based on the approximate linear extent of the erosion, the approximate height of the eroded bank, and staff judgement on the potential amount of eroded materials the could potentially enter the stream from each site.

The eroded areas were also categorized as stream bank "cuts", stream bank "slumps", and areas of "steep or unstable slopes". Stream bank "cuts" were characterized by relatively low bank heights (e.g. +/- 5 feet) and long linear distances. These areas are typically located on the outside edge of various channel meanders. Stream bank "slumps" were characterized as relatively large areas of the stream bank that appeared to have had a structural failure of the underlying soils. As a result, large quantities of soil appeared to have collapsed and slid down the embankment. The slumps that were noted typically included relatively high banks and long linear distances that were eroded. Areas noted with "steep or unstable slopes" generally included a rather gravelly, shale-like rock face that may potentially contribute sediment to the creeks - more as a result of natural weathering and runoff.

A summary matrix of the type, severity, size and location of each stream bank erosion site is provided in Appendix A. Location maps are also provided within the discussion of each creek basin.

FULMER CREEK STREAM BANK EROSION

HISTORY

The following text "history" of stream bank erosion on Fulmer Creek is largely based on the June 1993 report titled, "Fulmer Creek Stream bank Erosion Inventory and Evaluation". The 1993 report was completed by the Black River-St. Lawrence RC&D Council in cooperation with the Herkimer County Soil and Water Conservation District and the USDA Soil Conservation Services.

Fulmer Creek has a long history of stream bank erosion, documented damage relating directly to erosion, and in-stream sedimentation that has resulted in numerous problems within the watershed. The NYS Canal Corporation routinely dredges sediment (sand and gravel) from the mouth of Fulmer Creek as it enters the NYS Canal System. Additionally, NYS Route 168 parallels Fulmer Creek for over 5 miles and results in continuing highway maintenance issues near bridges, culverts, and eroded roadway embankments.

As the 1993 report states, "There are documented damages caused by out-of-bank flow and severe erosion of the stream banks of Fulmer Creek in 1974, 1976, 1981, and 1986." While a team from the Soil Conservation Service examined the watershed in 1981, regarding the potential construction of a flood control project, it was noted that the amount and extent of damage would not result in an acceptable cost/benefit ratio. The 1993 further stated that, "The more serious problem appeared to be stream bank erosion, and the damage [resulting from sediment deposition]".

In June of 1990, the Herkimer County Soil and Water Conservation District (HC SWCD) undertook an inventory of the stream bank erosion sites along the Fulmer Creek. The report identified and photographed a number of sites and also suggested proposed alternatives for "treatment" of erosion at each of these sites. The following inventory incorporates many of the notations and alternatives suggested by the HC SWCD used in combination with the inventory conducted by the Herkimer-Oneida Counties Comprehensive Planning Program on March 28, 2003.

STREAM BANK EROSION SITES

"DeGristina Property" Site: One of the most visible stream bank erosion sites is located near the confluence of Fulmer Creek and the Mohawk River. At this location, the eastern bank of Fulmer Creek has migrated approximately 150 feet further to the east as a result of a **severe** bank **cut**. The bank cut extends linearly for approximately 700 feet and is perhaps, 8 to 10 feet high from the streambed to the top of the bank. It should be noted, however, that the height of

the bank cut appears differently depending upon whether the NYS Canal System is drained or maintained at a higher water level for navigation. Figure 1 is photographed during winter months when the Canal has been lowered. The photo is taken from NYS Route 5s looking to the north.

Figure 1: Severe stream bank cut at the DeGristina site.

"Spring Street" Site: Near the intersection of Spring Street and Bushnell Street in the Village of Mohawk, the west bank of Fulmer Creek has a **slight** linear bank **cut**. Although trees line the current banks, the exposed roots attest to the continued erosion in this area. The height of the bank erosion is less than 3 feet and extends linearly for approximately 100 feet.

"Route 28 Bridge – Retaining Wall" Site: Approximately 300 feet south of the Route 28 bridge over Fulmer Creek, the east bank of the creek is eroding toward State Route 168. In this location, the flow of the creek is directed at the southern end of a retaining wall that has partially collapsed. The bank **cut** is relatively small (less than 100 feet linearly) and can be categorized as a **moderately** significant area of erosion. The erosion will likely continue to collapse portions of the retaining wall. Large cobbles from the retaining wall have fallen into the stream channel. Figure 2 illustrates erosion at this site and the photo is taken looking toward the eastern bank.

Figure 2: Collapsed Retaining Wall.

"Bielanski Property" Site: This eroded stream bank is located approximately 1200 feet south of the NYS Route 28 bridge, behind the Bielanski residence at 3757 St Rt 168. In this location, the west bank of the creek has a relatively large and **severe** bank **slump**. The photo in Figure 3 is taken looking to the west.

Figure 3: Severe bank slump behind the Bielanski residence.

"Town Barn Entrance" Site: Across NYS Route 168 from the entrance of the Town of German Flatts Town Barn entrance, there is a long stretch of bank erosion on the west side of the creek. While the bank **cut** is relatively low in overall height (e.g. less than 5 feet), it may be significant because it extends 500 to 600 feet linearly. This site was characterized as a **slight** area of stream bank erosion. This area of the creek is also noteworthy because of the large deposits of gravel in the center of the channel. Figure 4 illustrates erosion at this site and the photo is taken looking toward the western bank.

Figure 4: Typical stream bank cut on Fulmer Creek.

"Emerich Bridge" Site: Just upstream of the private bridge crossing to the Emerich property, there is a **slight** area of bank erosion on the western bank. This relatively small bank **cut** is located on the outside curve of a stream meander and exposes the underlying shale rock. Figure 5 illustrates the exposed rock.

The 1993 report titled, “Fulmer Creek Stream bank Erosion Inventory and Evaluation” also notes this general area of the creek as having bank erosion on both sides of the creek that “threaten a trailer park and private bridge”. Since the report was published, the bridge abutments have been reconstructed.

Figure 5: Bank cut near Emerich’s bridge.

“Helmer Trailer Park” Site: On the west bank of the creek behind the trailer park on property owned by J. Helmer, is a **severe** bank **cut**. The height of the cut is approximately 15 to 20 feet and extends approximately 200 feet linearly. Figure 6 includes a photo taken in the southwest corner of the trailer park and depicts the west bank. In this photo, the creek bed is located behind the utility shed but in front of the eroded bank.

Figure 6: Severe bank cut on the western bank of Fulmer Creek.

“Barnett Property” Site: Located behind the F. Terry property at 3539 State Route 168, the creek makes a sharp turn – heading almost perpendicular toward Rt. 168. On the west bank of the creek in this location there is an area of **moderately** significant stream bank erosion. The bank **cut** occurs on the outside edge of the creek’s curve and is located on the J. Barnett property line.

"Casey Road" Sites: To the south of the intersection of Casey Road and NYS Route 168 there are two sites that contain **slight** bank **cuts** on the eastern banks of the creek. The northern most site in this location extends for a linear distance of approximately 300 feet. The southern site in this location extends for a linear distance of approximately 400 feet.

The height of both areas of bank erosion is less than 8 feet. Figure 7 illustrates the bank erosion at the northern site while Figure 8 illustrates the erosion at the more southern location.

Figure 7: (Above) Northern most bank cut near Casey Road.

Figure 8: (Left) Southern most bank cut near Casey Road.

"Route 168 Double Bridge" Site: Approximately 1200 feet south of the intersection of Casey Road and NYS Route 168 - between the two bridges on Rt. 168 in this location - there is an area of **severe** bank erosion. A significant quantity of the soils on the west bank of the creek has failed. The bank **slump** is the largest of any bank erosion site within the three basins. The site is probably over 350' linearly and over 150' high. Figure 9 and the cover page of this report; illustrate the extent of this bank erosion.

The 1993 report titled, "Fulmer Creek Stream bank Erosion Inventory and Evaluation" also notes, "this segment is comprised of an enormous gullied slipbank. The sequence of undercutting and subsequent failure of the overhanging upper layers is exacerbated by a perched water table a few feet below the [upper bank] surface." A rip-rap berm was placed on the west bank near the northern most bridge. During 1993 it was noted that the bank was "stabilizing behind the berm as indicated by the scattered vegetation." The report also suggested that, "Due to the large size and complexity of this [site], a more intensive hydrologic, engineering, and plant materials investigation should be undertaken prior to any future remedial action."

Figure 9: Most severe bank slump on Fulmer Creek.

"Pine Bush Road" Site: An 800 foot segment of the Creek near the intersection of NYS Route 168 and Pine Bush Road has **moderately** significant area of stream bank erosion. **Cut** banks are visible throughout this segment and range from approximately 5 to 7 feet high. The exposed roots of trees are indicative of the active nature of the eroded areas. The stream channel in this area is wide with many "braided" meanders. The 1993 report titled, "Fulmer Creek Stream bank Erosion Inventory and Evaluation" also notes, "areas within this segment are distinguished by the amount of debris (primarily in the form of brush dams) that litter the stream channel".

"Rockwell Property" Site: Approximately 1300 feet northerly of the intersection of NYS Route 168 and Mortz Road there is a **moderately** significant area of stream bank erosion – behind the Rockwell property at 3108 St Rt 168. The stream bank **cut** extends for approximately 300 feet on the eastern bank of the creek. The 1993 SWCD report also notes the presence of a significant brush dam in this area that "deflects some of the streams energy" against the western bank and toward this residence.

"Pickett Property" Site: Approximately 800 feet northerly of the intersection of NYS Route 168 and Mortz Road there is an additional area of **moderately** significant stream bank erosion. This stream bank **cut** is located across NYS Route 168 from the Pickett residence at 3068 St Rt 168. The erosion extends for approximately 200 feet on the eastern bank of the creek. The bank height is approximately 10 feet.

"Farm Implement Dealership" Site: Just downstream of the Route 168 bridge that is located south of the intersection with Mortz Road, the easterly bank of the creek is eroding **slightly**. According to the 1993 SWCD report, this bank **cut** erosion is "threatening the parking and display area of the farm implement dealership. Approximate stream bank height is 6 feet with a length of 175 feet."

"Pumilia Trailer Park" Site: Behind the trailer park located at 2975 St Rt 168, the westerly bank of the creek has a **moderately** significant area of bank erosion. This bank **cut** is located on the outside edge of the creek bend and is approximately 10 feet high and 150 feet long. Figure 10 illustrates this site.

Figure 10: Bank cut near the Pumilia Trailer Park

"Rock Hill Road" Site: Approximately 100 feet northerly of the intersection of Rock Hill Road and NYS Route 168, there is a **severe** bank **slump**. The slump is approximately 75 feet in height and extends linearly for approximately 200 feet around the outside edge of the creek bend.

Figure 11: Severe bank erosion near Rock Hill Road

“Heath Road” Site: Directly across from the intersection of Heath Road and NYS Route 168, there is a **slight** bank **slump**. This slump can be seen on the westerly bank of the creek behind the residence at 2573 St Rt 168.

“Cote Property” Site: Approximately 500 feet southerly of the intersection of Heath Road and NYS Route 168, there is a more recent bank **slump**. This **moderately** significant slump can be seen on the westerly bank of the creek across NYS Route 168 from the residence at 2536 St Rt 168.

“McCready Road” Site: Approximately 400 feet northerly of the intersection of McCready Road and NYS Route 168, there is a **moderately** significant bank **slump**. This slump is approximately 50 feet in height and extends approximately 50 feet linearly along the western bank. Figure 12 illustrates this bank slump.

Figure 12: Stream bank erosion near McCready Road

STEELE CREEK STREAM BANK EROSION

HISTORY

There are significantly less areas of stream bank erosion on Steele Creek in comparison to the Fulmer Creek basin. This is most likely due to the steep topography in the Steele Creek corridor, less land use disturbance as a result of the steep slopes, and the various types of underlying soils and rock.

While there are a few areas of bank "cuts" and bank "slumps" (as discussed below), erosion and sedimentation along Steele Creek is uniquely defined by the steep slopes of the stream banks. Throughout most of the stream corridor the steep cliffs and embankments seem to have naturally stabilized – often forming exposed rock faces. However, there are some areas of steep, gravelly, shale-like rock that appear to be contributing sediment more as a result of natural weathering and runoff.

Within the creek corridor there are also areas where small tributaries and runoff from the cliffs have cause long, narrow, eroded gullies. Vegetation in these areas is absent and materials are often transported into the creek during storm events. During one significant storm event, large quantities of mud and debris were washed down these gullies into the creek corridor.

NYS Route 51 parallels Steele Creek for over 8 miles and results in continuing highway maintenance issues near bridges, culverts, and eroded roadway embankments.

In the upstream portions of the creek corridor (from a point approximately 5.5 miles south of the intersection of NYS Route 51 and Spinnerville Road to the hamlet of Cedarville) the creek is characterized by large debris blockages, fallen trees, and numerous driveway culverts.

STREAM BANK EROSION SITES

"Spinnerville Road" Site: Just downstream of the Spinnerville Road bridge over Steele Creek, there is an area of **severe** bank erosion. A significant quantity of the soils on the easterly bank of the creek has failed. The bank **slump** is the largest of any bank erosion site within the Steele Creek corridor. The site is approximately 250 feet linearly and over 100 feet high.

Figure 13: Severe stream bank erosion on east bank of Steele Creek.

"Reservoir" Site: Approximately 1 mile south of the intersection of Spinnerville Road and NYS Route 51, there is an area of **moderately** significant bank erosion. The bank **slump** is located on the westerly bank of Steele Creek and is approximately 50 feet high and 50 feet linearly. Regarding the location of this site, the photo of aerial imaging shows the Ilion Reservoir #2 to the southeast.

"Ferdula Mine" Sites: While the areas of active mining at the Ferdula gravel and sand mine do not directly abut the creek, there may be a potential for stormwater runoff to transport sediment and materials into the creek from recently mined and/or reclaimed slopes. Additionally, just upstream of the Ferdula mine, there is an area of **moderately** significant bank erosion on the western bank of the creek. This bank **slump** is approximately 100 feet in height and 300 feet linearly. From this point moving upstream, the entire western bank of the creek is steep, scarcely vegetated, and eroding to the intersection of NYS Route 51 and Jerusalem Hill Road. Figure 14 illustrates the northerly slope of the Ferdula mining operation. Steele Creek can be seen just behind the highway embankment.

Figure 14: Potential area of runoff and sedimentation.

"Jones Hill Road" Site: Just downstream of the intersection of Jones Hill Road and NYS Route 51 there is a **slight** bank **slump**. The bank slump is approximately 50 feet high and extends 50 feet along the eastern bank of the creek.

"Route 51 Bank Cut" Site: For a linear distance of approximately 1600 feet along Route 51 there is a **moderately** significant bank **cut** along the eastern bank of the creek. This bank cut starts at a point approximately 4.9 miles upstream of the intersection of NYS Route 51 and Spinnerville Road and ends approximately 5.2 miles upstream of this same intersection.

MOYER CREEK STREAM BANK EROSION

HISTORY

As with Steele Creek, there are significantly less areas of stream bank erosion on Moyer Creek in comparison to the Fulmer Creek basin. This is most likely due to the steep topography in the Moyer Creek corridor as one proceeds south along NYS Route 171 and into the "gorge". However, in comparison to the Steele Creek gorge, the Moyer Creek corridor has more interspersed areas where the floodplain widens and development has occurred on these relatively large, flat open areas.

While there are a few areas of bank "cuts" and bank "slumps" (as discussed below), erosion and sedimentation along Moyer Creek is uniquely defined by the steep slopes of the stream banks. Throughout much of the stream corridor the steep cliffs and embankments seem to have naturally stabilized – often forming exposed rock faces. However, there are some areas of steep, gravelly, shale-like rock that appear to be contributing sediment more as a result of natural weathering and runoff.

STREAM BANK EROSION SITES

"Edgebrook Estates" Site: Approximately 1000 feet downstream of the NYS Route 5s bridge over Moyer Creek there is a relatively large trailer park (Edgebrook Estates) located on the western bank of the creek. Across the creek from this trailer park (on the western bank) there is an area of **severe** bank erosion. The bank **slump** in this area is approximately 50 in height and extends linearly for approximately 125 feet. Figure 15 includes a view of this site looking west from the trailer park property.

Figure 15: Erosion near Edgebrook Estates in Frankfort.

"Brice Road" Site: Just downstream of the intersection of Brice Road and NYS Route 171 there is an area of **moderately** significant bank erosion. The bank **cut** extends approximately 200 feet linearly along the western bank of the creek.

"Smiley Property" Site: A relatively large bank **slump** exists on the eastern bank of the creek behind the Smiley residence at 1182 St Rt 171. This slump is a **severe** area of bank erosion and extends approximately 200 feet linearly and 100 feet in height. The photo in Figure 16 is taken from NYS Route 171 looking east.

Figure 16: A severe streambank slump on the eastern bank of Moyer Creek.

"Route 171 Bridge" Site: Continuing south of Brice Road for approximately .7 miles, Moyer Creek passes under NYS Route 171. Directly to the west of this bridge, there is a **moderately** significant area of stream bank erosion. The eastern bank of the creek has **"slumped"** and has exposed an area approximately 20 feet high and 50 feet long. The photo in Figure 17 is taken from NYS Route 171 looking southwest.

Figure 17: Typical stream bank erosion on Moyer Creek.

"North and South Bridge" Site: From the northern most bridge referenced above (located approximately .7 miles from the intersection of Brice Road) to the next bridge south along NYS Route 171 (located approximately 800 feet further south), Moyer Creek passes through a narrow gorge with very **steep slopes** on both sides of the road. On the western bank of the creek there is a **moderately** significant, steep, shale cliff that extends along the entire outside curve of the creek in this location (roughly 800 linear feet). Figure 18 includes a photo of this area looking southwest from NYS Route 171.

Just upstream of this site, there is an additional area that contains a large shale cliff that overhangs the creek on its eastern bank. Figure 19 illustrates this site as seen from NYS Route 171 looking northwest.

Figure 18: (Right) Steep and unstable slopes on the western bank of Moyer Creek.

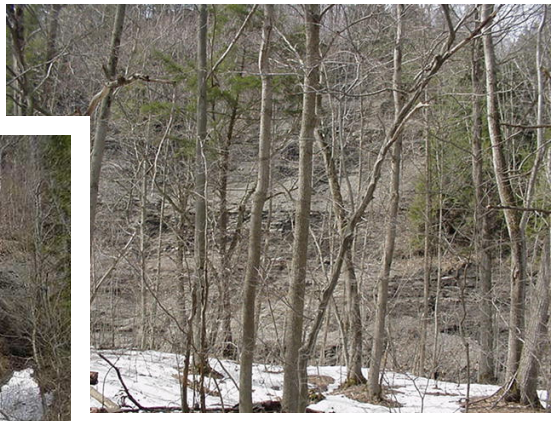


Figure 19: (Left) Steep and unstable slopes on the eastern bank of Moyer Creek.

"F. Fox Property" Sites: As the creek passes behind the F. Fox property located at 944 St Rt 171, a **moderately** significant area of bank erosion occurs on the outside bend of the creek's eastern bank. This bank **slump** is approximately 75 feet long and almost 40 feet in height. Figure 20 shows this bank slump looking toward the southeast from NYS Route 171.

Just downstream of this site, there is a **moderately** significant bank **cut** that parallels NYS Route 171 for approximately 400 feet. The bank cut is located on the eastern bank of the creek and is approximately 5 feet in height.

Figure 20: Bank slump near Fox residence.

"The Falls" Site: Approximately 3000 feet south of where the large overhead transmission lines cross NYS Route 171, there is a relatively large natural waterfall on the western side of the road. Just upstream from the falls there is a **moderately** significant bank **slump**. The slump is approximately 50 feet high and 50 feet long.

"Furnace Road" Sites: Approximately 2200 feet north (downstream) of the intersection of Furnace Road and NYS Route 171, there are two **moderately** significant areas of **steep and unstable** rock slopes. The area on the eastern slope of the creek extends approximately 300 feet linearly around the inside curve of the creek bend in this

location. Across NYS Route 171 from this location, there is a much larger area of steep and unstable rock slopes on the western bank of the creek. This steep slope extends approximately 600 feet linearly along NYS Route 171 in the "gorge". Both of these areas look very similar to those illustrated in Figures 18 and 19.

Also in this area, approximately 500 feet north (downstream) of the intersection of Furnace Road and NYS Route 171, there is a unique example of a bank **slump** that is more linear in nature. In this example, the bank slump follows a narrow gorge of a very small tributary that bisects the steep slope. While this type of narrow slump may be only **slightly** significant with regard to sediment loading, the area extends more than 200 feet upslope.

"Fish Road" Site: Just downstream of the intersection of Fish Road and NYS Route 171, there is a **slight** bank **slump** on the eastern bank of the creek. The slump is approximately 15 feet high and 30 feet long.

"Ball Road" Site: Near the intersection of NYS Route 171 and Ball Road, there is a **moderately** significant bank **slump** on the eastern bank of the creek. This slump is approximately 30 feet high and extends 50 feet linearly along the outside edge of a bend in the creek.

SUMMARY OF STREAMBANK EROSION SITES ON FULMER CREEK, MOYER CREEK AND STEELE CREEK

Table 1: Summary Matrix

BASIN	SITE REFERENCE	TYPE	SEVERITY	ESTIMATED (ft)	
				HEIGHT	LENGTH
Fulmer	DeGristina Property	Bank Cut	Severe	8 to 10	700
	Spring Street	Bank Cut	Slight	3	100
	Rt 28 Retaining Wall	Bank Cut	Moderate	<5	<100
	Bielanski Property	Bank Slump	Severe	30	250
	Town Barn Entrance	Bank Cut	Slight	<5	500 to 600
	Emerich Bridge	Bank Cut	Slight	<5	15
	Helmer Trailer Park	Bank Cut	Severe	15 to 20	200
	Barnett Property	Bank Cut	Moderate	<5	25
	Casey Road	Bank Cuts	Slight	<8	300 and 400
	Rt 168 Double Bridge	Bank Slump	Severe	150	650
	Pine Bush Road	Bank Cut	Moderate	5 to 7	800
	Rockwell Property	Bank Cut	Moderate	<5	300
	Pickett Property	Bank Cut	Moderate	10	200
	Farm Dealership	Bank Cut	Slight	<6	175
	Pumilia Trailer Park	Bank Cut	Moderate	10	150
	Rock Hill Road	Bank Slump	Severe	75	200
	Heath Road	Bank Slump	Slight	<15	<20
	Cote Property	Bank Slump	Moderate	<20	<20
	McCready Road	Bank Slump	Moderate	50	50
Steele	Spinnerville Road	Bank Slump	Severe	100	250
	Reservoir Site	Bank Slump	Moderate	50	50
	Ferdula Mine	Bank Slump	Moderate	100	300
	Jones Hill Road	Bank Slump	Slight	50	50
	Route 51 Bank Cut	Bank Cut	Moderate	<5	1600
Moyer	Edgebrook Estates	Bank Slump	Severe	50	125
	Brice Road	Bank Cut	Moderate	<5	200
	Smiley Property	Bank Slump	Severe	100	200
	Rt 171 Bridge	Bank Slump	Moderate	20	50
	North/South Bridge	Steep/Unstable Slopes	Moderate	>100	800
	Fox Property	Slump/Bank Cut	Moderate	40/<5	75/400
	The Falls	Bank Slump	Moderate	50	50
	Furnace Road	Slump/Steep Slopes	Moderate	na/>100	200/300
	Fish Road	Bank Slump	Slight	15	30
	Ball Road	Bank Slump	Moderate	30	50

APPENDIX D

STATE AND FEDERAL PROGRAMS
For
FLOOD HAZARD MITIGATION ACTIVITIES

Note: *Much of the following information was summarized from two publications, "Federal Programs Offering Non-Structural Flood Recovery and Floodplain Management Alternatives", June 1998 by The Office of Management and Budget within the Executive Office of the Presiden; and, "CRS Coordinators Manual", January 1999 by FEMA.*

Hazard Mitigation Grant Program (HMGP)

Objective: *Provide funds to states and communities for implementing long-term hazard mitigation measures following a major disaster declaration.*

Agency: Federal Emergency Management Agency (FEMA) and State Emergency Management Office (SEMO).

Link to Non-Structural Alternatives: The HMGP can be used to fund projects to protect both public and private property. Types of eligible projects include, but are not limited to, elevation, acquisition, or relocation of structures and retrofitting of facilities.

The Hazard Mitigation Grant Program is a Post Disaster Program designed with the intent to reduce future disaster damages, public expenditure, private losses and a community's vulnerability to natural hazards. This program is the major source of mitigation funding in the state and is triggered by a Presidential disaster declaration. Eligible applicants usually are confined to state and local agencies who propose projects in disaster-designated areas. The program provides 75% federal share for approved projects that are recommended to the Federal Emergency Management Agency (FEMA) by SEMO.

Forms of Assistance: Grants.

Program Target: State and local governments and certain private, non-profit organizations or institutions and Native American tribes.

Total Funding: Federal funding available under the HMGP is based on 15% of the Federal funds spent on the Public Assistance and Individual Assistance programs (minus administrative expenses) for each disaster.

Eligibility Requirement(s): Projects must be cost-effective, must meet Federal environmental requirements, must be consistent with the overall State Hazard Mitigation Plan, and must be within an area covered by a Federal disaster declaration.

Cost Sharing Requirement(s): 25 percent local, 75 percent Federal.

Repayment Requirement(s): None.

Application Procedure(s): Contact your FEMA Regional Office or your State Hazard Mitigation Officer (SEMO).

Application Time Line: The state notifies FEMA of intent to participate in the program within 60 days of the disaster declaration. Applications for mitigation projects are encouraged as soon as possible following a disaster declaration so that mitigation opportunities are not lost during reconstruction. All applications must be submitted no later than 90 days following FEMA's approval of the State Hazard Mitigation Plan.

Programmatic/Funding Constraint(s): Projects must be consistent with FEMA's HMGP Regulations found at 44 CFR Part 206, Subpart N. Additional guidance for state and local applicants has been developed and is available from FEMA Headquarters or your FEMA Regional Office.

Other Comments: The HMGP is a state-administered program in which funding priorities and project selection is based upon recommendations made by the state. FEMA retains final approval of each project.

Contacts:

Contact Title, Office, and Address	Service Area	Phone Number
SEMO Bldg 22 Suite 101 1220 Washington Ave Albany, NY 12226-2251	NY State	(518) 485-1797
FEMA NY District – Region II 26 Federal Plaza New York, NY 10278	NY, NJ, PR,	(212) 680-3600
Program Support Division Mitigation Directorate - FEMA 500 C Street, SW Washington, DC 20472	National Headquarters	(202) 646-4621

Flood Mitigation Assistance (FMA)

Objective: *Provides funds to states and communities for pre-disaster mitigation, to help reduce or eliminate the long-term risk* of *flood damage to buildings, manufactured homes, and other insurable structures. The long-term goal of the FMA is to reduce or eliminate claims under the National Flood Insurance Program (NFIP).*

Agency: Federal Emergency Management Agency (FEMA)

Contact: Program Support Division, Mitigation Directorate, National Headquarters, (202) 6464621. A complete list of regional contacts is included at the end of this program summary.

Link to Non-Structural Alternatives: The program focus is to protect or remove insured structures from the floodplain. Eligible types of projects include elevation, acquisition, or relocation of insured structures.

Forms of Assistance: The program provides cost-shared grants for three purposes:

1. Planning Grants to states and communities to assess the flood risk and identify actions to reduce that risk;
2. Project Grants to states and communities to execute measures to reduce flood losses; and
3. Technical Assistance Grants that states may use to assist communities to develop viable FMA applications and implement approved projects.

Program Target: States, communities, certain private, non-profit organizations, and Native American Nations participating in the NFIP.

Total Funding: A maximum of $20 million annually may be credited to the National Flood Insurance Fund for use under FMA. The annual funding level is dependent upon the number of flood insurance policies in-force under the NFIP. All costs associated with FMA will be borne by flood insurance policyholders. States must ensure that the following legislative funding limits are followed:

A maximum of $1,500,000 may be allocated for Planning Grants nationally each fiscal year. A Planning Grant will not be awarded to a state or community more than once every 5 years, and an individual Planning Grant will not exceed $150,000 to any state agency applicant, or $50,000 to any community applicant. The total Planning Grant made in any fiscal year to any state, including all communities within the state, shall not exceed $300,000.

The total amount of FMA Project Grant funds provided during any 5-year period shall not exceed $10,000,000 to any state or $3,300,000 to any community. The total amount or Project Grant funds provided to any state, including all communities within the state, shall not exceed $20,000,000 during any 5-year period.

A maximum of ten percent (10%) of funds available for Project Grants will be allocated for use as Technical Assistance Grants each fiscal year. The state shall use these funds to assist communities in completing project applications

Eligibility: Structures must be insured through the NFIP at the time of application. States or communities requesting consideration for a Project Grant must have a Flood Mitigation Plan approved by the FEMA Regional Director.

Cost-Sharing: 25 percent local, 75 percent Federal.

Repayment Requirement(s): None.

Application Procedure(s): Contact your FEMA Regional Office.

Application Time Line: Contact your FEMA Regional Office.

Programmatic/Funding Constraint (s): The use of Planning, Project, or Technical Assistance Grants must be in conformance with 44 CFR Part 78. Additional guidance for states and local applicants is available from FEMA Headquarters or your FEMA Regional Office.

Other Comments: FMA is a state administered program. The state is responsible for determining funding priorities within the state and selecting projects that conform with the state mitigation objectives. FEMA retains final approval of each project.

Contacts:

Contact Title, Office, and Address	Service Area	Phone Number
SEMO Bldg 22 Suite 101 1220 Washington Ave Albany, NY 12226-2251	NY State	(518) 485-1797
FEMA NY District – Region II 26 Federal Plaza New York, NY 10278	NY, NJ, PR,	(212) 680-3600
Program Support Division Mitigation Directorate - FEMA 500 C Street, SW Washington, DC 20472	National Headquarters	(202) 646-4621

Flood Plain Management Services

(Section 206 of the 1960 Flood Control Act, as amended)

Objective: *Foster public understanding of the options for dealing with flood hazards and promote prudent use and management of the Nation's flood plains through technical assistance and planning guidance.*

Agency: Department of Defense (DoD), U.S. Army Corps of Engineers (USACE)

Link to Non-Structural Alternatives: The Flood Plain Management Services Program provides the full range of technical services and planning guidance that is needed to support effective flood plain management. The types of assistance available are listed below.

a. *General Technical Services.* The program develops or interprets site-specific data on floodplain patterns. It also provides technical information on natural and cultural flood plain resources, and flood loss potentials before and after the use of flood plain management measures.

b. *General Planning Guidance.* On a larger scale, the program provides assistance and guidance through studies on all aspects of flood plain management planning, including the possible impacts of plain land use changes on the physical, socio-economic, and environmental conditions of the flood plain. Studies can range from helping a community identify present or future flood plain areas and related problems, to a broad assessment of which of the various remedial measures may be effectively used. Some of the most common types of studies include:

- Flood Plain Delineation/Flood Hazard Evaluation Studies
- Dam Break Analysis Studies
- Hurricane Evacuation Studies
- Flood Warning/Preparedness Studies
- Regulatory Floodway Studies
- Comprehensive Flood Plain Management Studies
- Flood Damage Reduction Studies
- Urbanization Impact Studies
- Stormwater Management Studies
- Flood Proofing Studies
- Inventory of Flood Prone Structures.

c. The program also provides guidance and assistance for meeting standards of the National Flood Insurance Program and for conducting workshops and seminars on non-structural flood plain management measures, such as floodproofing.

d. *Guides, Pamphlets, and Supporting Studies.* The program enables studies to be conducted to improve methods and procedures for mitigating flood damages. It also can be used for preparing guides and pamphlets on flood proofing techniques, flood plain regulations, flood plain occupancy, natural flood plain resources, and other related aspects of flood plain management.

Form of Assistance: Technical assistance and planning assistance.

Program Target: State, regional, and local governments, Native American tribes, and other non-Federal public agencies.

Eligibility: State, regional, and local governments, Native American tribes, and other nonFederal public agencies.

Total Annual Funding: Approximately $9 million appropriated in FY 1998, Corps-wide.

Cost-Sharing Requirement: Program services are provided to state, regional, and local governments, Native American tribes, and other non-Federal public agencies without charge. Implementation costs for proposed measures are 100 percent non-Federal, absent eligibility or authorization for another Corps program.

Program services also are offered to non-water resource Federal agencies and to the private sector provided that they provide advance funding for 100 percent of costs.

Repayment Requirement(s): None.

Application Procedure(s): Written requests for services should be sent directly to the appropriate Corps offices noted in the table below.

Application Timeline: Requests are generally honored on a first-come, first-served basis, within the limits of available appropriations.

Programmatic/Funding Constraint(s): Constrained by available funding.

Other Comments: This program is not intended to be a substitute for other Corps planning activities. All requestors are encouraged to furnish available field survey data, maps, historical flood information and the like, to help reduce the cost of services.

Regional Contacts:

Division	Office	Phone Number
North Atlantic	Flood Plain Management	(212) 264-7813

NFIP and Community Rating System Assistance

Objective: *Each of the ten FEMA Regional Offices has a Mitigation Division that handles the administration of the National Flood Insurance Program (NFIP), the Community Rating System (CRS), and several mitigation funding programs. These offices help states, communities and private entities interpret the federal regulations.*

Agency: Federal Emergency Management Agency (FEMA) Regional Office - Mitigation Division, NYS Department of Environmental Conservation and NYS Emergency Management Office.

Program Description: Regional staff includes engineers and planners who are assigned to help communities. They provide technical assistance and publications to help citizens and local officials understand NFIP flood maps and the regulatory requirements for communities to participate in the NFIP. While each office has one person designated as the lead person for the CRS, a local official's first point of contact should be the planner or emergency management specialist assigned to that community.

Contacts:

Contact Title, Office, and Address	Service Area	Phone Number
SEMO Bldg 22 Suite 101 1220 Washington Ave Albany, NY 12226-2251	NY State	(518) 485-1797
FEMA NY District – Region II 26 Federal Plaza New York, NY 10278	NY, NJ, PR,	(212) 680-3600
Program Support Division Mitigation Directorate - FEMA 500 C Street, SW Washington, DC 20472	National Headquarters	(202) 646-4621

FEMA Emergency Management Institute

Objective: *To provide training and education to emergency managers, firefighters, and elected officials in many areas of emergency management, including emergency planning, exercise design and evaluation disaster management, hazardous materials response, and fire service management.*

Agency: Federal Emergency Management Agency (FEMA) Regional Office - Mitigation Division

Program Description: FEMA's National Emergency Training Center in Emmitsburg, MD, is the home of the Emergency Management Institute (EMI) and the National Fire Academy. There, emergency managers, firefighters, and elected officials can take classes in many areas of emergency management, including emergency planning, exercise design and evaluation disaster management, hazardous materials response, and fire service management. EMI course are also given by many states. An Independent Study Program is also available to private citizens. Special seminars and workshops are offered via satellite as part of FEMA's *Emergency Education Network*, called EENET.

Courses of special interest to engineers, architects and building code officials are:

Retrofitting Floodprone Residential Buildings
Multihazard Building Design Summer Institute
Digital Hazard Data Course
Managing Floodplain Development Through the National Flood Insurance Program
National Flood Insurance Program - Community Rating System

Point of Contact:

Contact Title, Office, and Address	Service Area	Phone Number
SEMO Bldg 22 Suite 101 1220 Washington Ave Albany, NY 12226-2251	NY State	(518) 485-1797
FEMA NY District – Region II 26 Federal Plaza New York, NY 10278	NY, NJ, PR,	(212) 680-3600

National Water Data Exchange

Objective: *To collect and disseminate data relating to flooding and stream hydrology.*

Agency: Department of the Interior, US Geological Survey (USGS)

Program Description: The USGS performs surveys, investigations and research, covering topography, geology, hydrology, and the mineral resources of the United States. They classify lands as to their mineral water resources and publish and disseminate data relative to the foregoing activities. The USGS also publishes flow rates, and peak flows of certain streams and rivers.

Each state has a User Assistance Center. These centers can provide

- Factual information on flood peaks and discharges, flood depths and velocities, profiles of the water surface and areas inundated during major floods, time-of-travel of flood wave, and sediment transport information;
- Interpretative information regarding flood frequency relations, estimates of 10-, 50-, 100-, and 500-year flood discharges, computed water surface profiles, and flood-prone areas delineated on topographic maps;
- Assistance in minimizing flood losses by quickly identifying areas of potential flood hazards; and
- Additional information on the hydrology of floodplains.

Point of Contact: USGS Office or State NFIP Coordinator.

Contact Title, Office, and Address	Service Area	Phone Number
NYS DEC NFIP Coordinator 625 Broadway Albany, NY 12233	NY State	(518) 402-8146
USGS 425 Jordan Rd Troy, NY 12180		(518) 285-5600

Local Flood Warning Systems

Objective: *To provide weather forecasts to the general public, issue warnings against natural events, such as hurricanes, tornadoes, floods, and tsunamis, provide special services in support of aviation, marine activities, agriculture, forestry, urban air quality control, and other weather-sensitive activities; monitor and report all non federal weather modification activities conducted in the U.S.*

Agency: National Oceanic and Atmospheric Administration, National Weather Service (NWS)

Link to Non-Structural Alternatives: Floodplain information and interpretation assistance for specific points on larger rivers of the United States can be obtained from the National Weather Service. NWS provides flood forecasts and warnings on larger rivers and provides flash flood warnings on smaller streams. Interested communities are assisted in establishing flood warning systems.

Also, storm surge frequency information and interpretative assistance are available for the Gulf of Mexico and Atlantic coasts. Studies have been completed for the Gulf of Mexico coast from the Alabama-Florida border to southern Florida and along the Atlantic coast from southern Florida to Cape Henlopen, the southern boundary of Delaware Bay. NWS also provides warnings of storm surges associated with tropical and extra-tropical storms.

Point of Contact: Regional Office of the NWS

Eastern: Bohemia, NY (516) 244-0100
(Connecticut, Delaware, District of Columbia,
Rhode Island, Maine, Maryland, Massachusetts,
New Hampshire, New Jersey, New York, North Carolina,
Ohio, Pennsylvania)

Joint Loss Reduction Partnership Project

Objective: *To utilize the expertise of many of the state's home corporations in recommending and beginning the implementation of actions which are necessary to make businesses "disaster resistant."*

Agency: NYS State Emergency Management Office (SEMO)

Contact: Hazard Mitigation Specialist, NYS SEMO, Bldg 22, Suite 101, 1220 Washington Avenue, Albany, NY 12226-2251. (518) 485-1797.

Link to Non-Structural Alternatives: New York State has sponsored the Joint Loss Reduction Partnership project under the leadership of the State Emergency Management Office (SEMO). The partnership comprises a cross-section of the state's business leadership, along with key federal, state and local government officials, all of whom are familiar with business disruptions and their potentially devastating consequences in our communities.

The project is receiving funding support from the Federal Emergency Management Agency and a host of other public and private sector sources. In addition to a committee-wide dedication to training, planning and public awareness needs, subcommittees have been established on the following critical crisis management issues: commercial practices, emergency access, financial support, legislation, clearing house technology and business facility mitigation. The solutions generated by the State Joint Loss Reduction Partnership Committee will provide a blueprint for the improvement, at the community level, of corporate emergency preparedness throughout the Empire State.

Form of Assistance: Advice and a committee-wide dedication to training, planning and public awareness needs

Program Target: Private businesses, and State and local organizations.

Total Funding: n/a

Eligibility: n/a

Cost Sharing: n/a

Clean Water Act Section 319 Grants

Objective: *Funds are awarded to the States to implement State non point source programs pursuant to Section 319(h) of the Clean Water Act.*

Agency: Environmental Protection Agency (EPA), NYS Department of Environmental Conservation (DEC)

Contact: EPA Branch Chief, Office of Water, Non-point Source Control Branch, (202) 260-7088 (Additional information is available at http://www.epa/gov/owow/nps.). NYS DEC Region 6 office (315) 793-2554.

Link to Non-Structural Alternatives: These grants can be used for funding non-structural watershed resource restoration activities that include wetlands and other aquatic habitat.

Form of Assistance: Grants.

Program Target: EPA to State agencies. State to Local Governments.

Total Funding: $105 million appropriated in Federal FY 1998.

Eligibility: EPA approved state non-point source management program required.

Cost-Sharing: 40 percent state match.

Repayment Requirement(s): None.

Application Procedure(s): States apply annually to EPA Regional Office.

Application Time Line: States are to submit final applications on March 1; decision are made by May 1.

Programmatic/Funding Constraint(s): Funding goes to all states by formula; dollars per state are limited.

Other Comments: Only certain restoration activities are fundable: those that control non-point pollution and that are within the scope of approved state non-point programs (e.g., relocation of structures would not be fundable; wetland restoration would be fundable).

Clean Water State Revolving Funds

Objective: *Build or relocate wastewater treatment plants.*

Agency: Environmental Protection Agency (EPA) and NYS Department of Environmental Conservation (DEC)

Contact: EPA Branch Chief, Office of Water, State Revolving Fund Branch, (202) 260-7359 . NYS DEC Region 6 office (315) 793-2554.

Link to Non-Structural Alternatives: Could be used to relocate, repair or replace wastewater treatment plants damaged by flooding.

Form of Assistance: Loans at below market interest rates for up to 20 years.

Program Target: Loans can be made to towns, counties, conservation districts, and other public agencies; loans for certain activities may be available to private parties.

Total Funding: SRF funds available for loans from 1987 through 1997 is about $24 million.

Eligibility: Loans available for agricultural, rural and urban runoff control; estuary improvement; wet weather flow control; and alternative treatment technologies.

Cost-Sharing: Local municipalities or others who quality receive loans and make payments to the State Revolving Fund.

Repayment Requirement(s): Repayments based on final loan amortization schedule, but generally 20 years or less. Adjustable rate loans, stepped payments, and balloon payments allowed at State discretion.

Application Procedure(s): Every State is different, but-each State has a designated SRF agency to which interested parties may apply.

Application Time Line: Accelerated/emergency application processes vary State by State.

Programmatic/Funding Constraint(s): Legislation only allows these funds to be used for wastewater treatment facilities, certain non-point source activities, and activities covered by national estuary plans.

Drinking Water State Revolving Funds

Objective: *Build or relocate community water systems (both public and private).*

Agency: Environmental Protection Agency (EPA) and NYS Department of Environmental Conservation (DEC)

Contact: Branch Chief, Office of Water, State Revolving Fund Branch, (202) 260-7359. NYS DEC Region 6 office (315) 793-2554.

Link to Non-Structural Alternatives: Can be used to repair, replace, or relocate community water systems damaged by flooding.

Form of Assistance: Loans at below-market interest rates for up to 20 years, although disadvantaged communities may quality for 30 year loans.

Program Target: Public and privately owned community water systems.

Total Funding: A total of $2 billion was appropriated in FYs 1997-1998, but amount of loans available unknown due to different state treatment of funds.

Eligibility: Loans available for public/private community water systems; non-profit noncommunity water systems; compliance and public health related projects; restructuring or consolidation; planning and design; some types of land acquisition.

Cost-Sharing: None. Local municipalities receive loans and make payments to the State Revolving Fund.

Repayment Requirement(s): Repayments based on final loan amortization schedule, but generally 20 years or less. Disadvantaged communities may quality for 30 year loans. Adjustable rate loans, stepped payments, and balloon payments allowed at State discretion.

Application Procedure(s): Every state is different, but each state has a designated SRF agency to which interested parties may apply.

Application Time Line: Accelerated or emergency application processes are available, but this varies state-by-state.

HUD Disaster Recovery Initiative

Objective: *HUD's Disaster Recovery Initiative helps communities impacted by Presidentially declared disasters. HUD steps in with gap funding for recovery activities -- providing the glue that pulls together the full disaster recovery effort. Because Federal government resources will never be sufficient to cover the costs of total recovery, HUD's program requires a partnership of Federal, state and local governments, the business community, and citizens.*

Agency: Department of Housing and Urban Development (HUD) and NYS Governor's Office for Small Cities.

Contact: Public entities needing assistance under this program should contact the Community Planning and Development division at their respective HUD field office.

Link to Non-Structural Alternatives: Grantees must use the Disaster Recovery Initiative for buyouts, relocation, long-term recovery, and mitigation related to a covered disaster. There is a wide range of activities which may be funded from HUD Disaster Recovery Initiative funds:

- Acquisition of real property (including the buy out of properties in a flood plain and the acquisition of relocation property);
- Relocation payments and assistance for displaced persons, businesses, organizations, and farm operations;
- Debris removal, clearance and demolition;
- Repair, rehabilitation or reconstruction of residential and non-residential structures;
- Acquisition, construction, reconstruction, or installation of public facilities and improvements, such as water and sewer facilities, streets, neighborhood centers, and the conversion of school buildings for eligible purposes;
- Code enforcement in deteriorated or deteriorating areas, e.g., disaster areas;
- Assistance to facilitate homeownership among low- and moderate-income persons, e.g., downpayment assistance, interest rate subsidies, loan guarantees;
- Public services (within certain limits);
- Activities relating to energy conservation and renewable energy resources, incorporated into recovery;
- Assistance to for-profit businesses to carry out economic development or recovery activities that benefit the public through job creation/retention;
- Acquisition, construction, or reconstruction of buildings for the general conduct of government damaged or destroyed as a direct result of a Presidentially declared disaster;
- Construction of new replacement housing by units of general local government; and
- Planning and administration costs up to 20 percent of the grant.

Forms of Assistance: Grants.

Program Target: State and local governments.

Total Funding: Funds provided through emergency supplemental appropriations only. Amount varies depending on the magnitude of the disaster. $500 million was appropriated for HUD Disaster Recovery Initiative grants under Title II, Chapter 10 of the 1997 Emergency Supplemental Appropriations Act for Recovery from Natural Disasters (Public Law 105-18). This law covers disasters that receive a Presidential declaration between September 1, 1996 and September 30, 1997.

Eligibility Requirements: Eligible grantees are states and units of general local government which experience a Presidentially declared disaster.

Cost-Sharing Requirement(s): None.

Repayment Requirement(s): None.

Application Procedure(s): Each state and local government applicant must prepare a Disaster Recovery Plan for HUD approval. The plan must describe: the recovery needs resulting from the covered disaster; the grantee's overall plan for recovery; expected Federal, non-Federal public, and private resources, and their relationship, if any, to activities to be funded with HUD Disaster Recovery Grant funds; and the proposed uses for the HUD Disaster Recovery funds. The plan also must include monitoring standards and procedures and appropriate certifications.

To assist in planning, HUD will make Community 2020 software available to every jurisdiction. This software will permit states and localities to display proposed and completed projects on maps showing the social and economic conditions of neighborhoods. This could include existing projects funded by other agencies.

Programmatic/Funding Constraint(s): A grantee must use more than 50 percent of its HUD Disaster Recovery funds for activities that benefit persons of low- and moderate-income. However, the Secretary may waive this requirement on a case-by-case basis when there is good cause and the use of HUD Disaster Recovery funds will be consistent with a public purpose and reflects public accountability. Program requirements may be waived provided such actions are consistent with the purposes of the statute. Among the requirements which may not be waived are those related to civil rights, fair housing and nondiscrimination, the environment, and labor standards. HUD Disaster Recovery funds are intended to supplement, not replace, grants from the Federal Emergency Management Agency (FEMA) and other agencies. They may not be used for activities that can and will be funded by FEMA, the Small Business Administration (SBA), or the U.S. Army Corps of Engineers.

Other Comments:

Allocation of Funds: HUD allocates the funds directly to certain grantees based generally on a formula which reflects existing disaster recovery needs and needs that are not met by other federal programs.

Recordkeeping and Reporting: A critical part of protecting the public trust and ensuring accountability to the public for funds expended is keeping good records and reporting on results. Accordingly, grantees must maintain records and submit reports on accomplishments in accord with existing CDBG regulations.

Physical Disaster Loans and Economic Injury Disaster Loans

Objective: *Federal disaster loans to non farm, private sector owners of disaster damaged property for uninsured losses, including homeowners and renters, businesses of all sizes, and nonprofit organizations.*

Agency: U.S. Small Business Administration (SBA)

Contact: Assoc. Administrator for Disaster Assistance, National Headquarters, (202) 205-6734. A list of regional contacts follows this program summary.

Link to Non-Structural Alternatives: Primary form of Federal assistance in declared disasters for disaster damage to non-farm, private property to help home or business owners fund repair or replacement of uninsured or otherwise uncompensated losses.

Wetlands restoration: SBA disaster loan funds could be used by a property owner to restore any primary home or business property including, to a limited extent, wetlands damaged by flooding.

Relocation of non farm structures: Owners of non-farm, flood damaged properties may use SBA disaster loan funds to help fund acquisition of a replacement property at a different site. In cases of forced relocation (where a building permit to repair the damaged property will not be issued) or substantial damage (as defined by FEMA/NFIP) in a special flood hazard area, the damaged property may be treated as a total loss, making the property owner eligible for full replacement value. In the case of substantially damaged units, the relocation property must be outside a special flood hazard area. This assistance is available to all nongovernmental, non-farm property owners.

Mitigation: Physical disaster loan amounts may be increased by up to 20 percent for devices to mitigate against damage to real property from the same type of disaster.

Form of Assistance: Loan, generally with an interest rate of 4 percent, and with terms up to 30 years, depending on borrowers ability to repay. Bylaw, borrowers able to use their own resources to meet disaster needs without hardship (generally about 5 percent of applicants) have a higher interest rate, generally 8 percent, and businesses in these circumstances are limited by law to a repayment period of 3 years. Prior liens may be refinanced, within certain limits.

Program Target: Individuals (primary homeowners and renters), businesses (of all sizes), and nonprofit organizations. This covers the entire private sector, except for agricultural enterprises similar assistance is available from USDA programs).

Total Funding: Total funding levels is based on a combination of regular appropriation and emergency supplemental funds. Amount varies annually.

Eligibility: All property owners that are not governmental units and agricultural enterprises are eligible recipients. Eligible parties include: primary homeowners, renters, businesses of all sizes, and nonprofit organizations. Applicants own the damaged property. Eligibility is limited to uninsured or otherwise uncompensated losses. Applicants must have ability to repay loans. Full collateral is not required, but applicants must pledge any available collateral.

Cost-Sharing: None.

Repayment Requirement: All loans must be repaid. Applicants must be able to make loan payments from current income or cash flow from operations. (The law offers low interest rates, long terms, soma refinancing of prior liens, and other tools to make the loan assistance affordable to many disaster victims who could not otherwise afford to pay for the disaster recovery.) Terms of each loan are established by SBA in accordance with each borrowers' needs and ability to repay.

Application Procedure: Applicant must complete SBA disaster loan application, available from SBA representatives at all Disaster sites or through FEMA teleregistration process. SBA representatives are available to assist in completing the application and to answer questions.

Application Time Line: SBA processes most disaster business loan applications in 1 to 3 weeks from receipt by SBA. Timing of loan closing is determined by each borrower. Disbursement of loan funds s similar to a construction loan and is in increments as the borrower completes repairs. Duration of reconstruction projects varies widely as a function of the complexity of each project.

Programmatic/Funding Constraints: By law, disaster loans to businesses and nonprofit organizations are limited to $1.5 million. However, SBA has authority to waive that statutory maximum for businesses which are major sources of employment. Disaster loans to homeowners are limited to $200,000 for real estate, $40,000 for personal property, $200,000 for refinancing of prior liens, and up to 20 percent additional, but not to exceed $48,000 for additional mitigation devices not required by code. Governmental entities are not eligible. However, private entities established by governmental units may be eligible. By law, agricultural enterprises are not eligible for SBA disaster assistance; farmers may seek similar assistance from USDA.

Other Comments: Some levees are privately owned by businesses or nonprofit organizations. Thus potentially some private owners of levees may seek SBA disaster loan assistance. In addition to loans for physical disaster damage, small businesses located in the declared disaster area which have suffered adverse effects of the flood are also eligible for SBA economic injury disaster Assistance. Economic injury disaster loans are working capital loans to help a small business meet necessary obligations which it cannot meet as a result of the disaster during the period it is adversely effected by a disaster. A business need not have sustained property damage to qualify for economic injury assistance; decreased revenues caused by a disaster and resulting in insufficient cash flow to meet all ongoing obligations is a common form of eligible economic injury. These loans are at 4 Percent with terms up to 30 years.

Contacts: In addition to the following list, SBA disaster loan representatives can be found in the Federal Disaster Field Offices.

Contact Title, Office, and Address	Service Area	Phone Number
Assoc. Administrator for Disaster Assist. Small Business Administration 409 Third Street, S.W. Washington, D.C. 20416	National Headquarters	202-205-6734
Director Disaster Area 1 Office Small Business Administration 360 Rainbow Blvd., South 3rd Fl. Niagara Falls, NY 14303	Serves SBA Regions 1,2, and 3 CT, DC, DE, MD, ME, MA, NH, NJ, NY, PA, RI, VA, VT, WV, PR, VI	1-800-659-2955 716-282-4612

Post-Disaster Economic Recovery

Objective: *Make grant awards that will assist in the long-term economic recovery of communities, industries, andfirms adversely impacted by disasters.*

Agency: Department of Commerce (DOC), Economic Development Administration (EDA)

Contact: Disaster Recovery Coordinator, Washington D.C., (202) 482-6225

Link to Non-Structural Alternatives: Can provide funds to help finance long-term flood recovery and floodplain management strategies. EDA's recovery strategy is directed toward:

(1) initially awarding planning grants for economic recovery to help organize and mobilize the local response capabilities and to assist in the preparation of recovery strategies,
(2) awarding revolving loan fund grants to provide a local source of financing to promote business recovery, and
(3) awarding implementation construction project grants.

EDA anticipates a broad array of implementation project proposals and will give priority to those proposals which have greatest impact to enhance the commercial/industrial base of the affected area. EDA will also consider grant awards to respond to emergency infrastructure needs in advance of a final economic recovery strategy for the area.

Form of Assistance: Grants for economic recovery planning, technical assistance, revolving loan fund ;rants, and construction of infrastructure.

Program Target: State, sub-state planning areas, local governments to help mitigate the dislocation to the economic base of the area.

Total Funding: Funds provided, in part, through EDA's Title IX Economic Adjustment Assistance program and through emergency supplemental appropriations. FY 1997 Title IX funding was $31.7 million. FY 1997 emergency supplemental funding was $25 million for infrastructure in response to Hurricanes Fran and Hortense, and $50.2 million for revolving loan fund grants and infrastructure to he Upper Midwest Floods, Ohio River Valley floods, and other disasters. EDA's Title IX Economic Adjustment Assistance program is funded at $29.9 million in FY 1998, part of which may be used to assist communities in disaster recovery efforts.

Eligibility: States, units of local government, and certain non-profit organizations (i.e., community organizations) are eligible recipients; private for-profit entities are not eligible for EDA grants. Special economic adjustment grant funds (Title IX) may be redistributed as subgrants to other entities; they nay not be redistributed (except as loans) to for-profit entities.

Cost-Sharing:

Economic adjustment grants - 75 percent Federal/25 percent Local match
Technical assistance grants - 75 percent Federal/25 percent Local match Revolving Loan Fund *Grants* 75 percent Federal/ 25 percent Local match
Public Works direct grants - 80 percent Federal/20 percent Local match

Repayment Requirements(s): None.

Application Procedures(s): Following a review of project proposals, EDA will invite entities whose projects are selected for consideration to submit applications; the Application will include a Form ED 900, as approved by OMB Control No. 06100094.

Application Time Line: From receipt of application to decision:

-*Planning and technical assistance grants - 60* days
-*Economic adjustment grants (non-construction) - 60* days
-*Revolving loan fund grants - 60* days
-*Economic adjustment grants (construction) - 120* days
-*Public Works construction grants - 120* days

Programmatic/Funding Constraints(s): Funding available through EDA's Title IX Economic Adjustment Assistance programs and through emergency supplemental appropriations.

Other Comments: EDA will coordinate with other agencies at the program level and at headquarters to expedite efforts to eliminate program duplication. EDA will continue to coordinate program activities, with other agencies within Commerce through existing mechanisms.

Further information on programs can be obtained through EDA's Internet address (http://ecix.doc.gov)

Watershed Protection and Flood Prevention Program

Public Law 83-566

Objective: *The short-term objectives of the Watershed Protection and Flood Prevention Program, authorized by Public Law 83-566, are to provide technical assistance in planning works of improvement to protect, develop, and utilize the land and water resources in small watersheds under 250,000 acres in size.*

Agency: Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)

Contact: National Headquarters Office, Washington, D.C., (202) 690-0848. Herkimer County NRCS (315) 866-2520.

Link to Non-Structural Alternatives: Program purposes are watershed protection, flood prevention, end agricultural and nonagricultural water management. Conservation land treatment, structural, and nonstructural measures are used to address these purposes. Application of conservation land treatment measures to upstream watersheds is the main feature that separates this program from others. Nonstructural measures will be preferred. The program emphasizes planning through interdisciplinary teams which include the sponsors, other agencies, and environmental groups in all stages of plan development.

Form of Assistance: Technical assistance to state and local governments for planning watershed projects.

Program Target: Local organizations representing the people living in small watersheds.

Total Funding: $101 million appropriated in Federal FY 1998.

Eligibility: Watershed projects must address one or more of the purposes authorized by Public Law 33-566 to solve problems and needs that are beyond the capability of individual landowners. Projects must be sponsored by entities legally organized under state law, or any Indian tribe or tribal organization, having authority to carry out, operate, and maintain works of improvement. For plans hat incorporate structural or nonstructural measures, sponsors must have the power of eminent domain and the authority to levy taxes or use other adequate funding sources to finance their share of the project cost and all operation, maintenance, and replacement costs of works of improvement.

Cost Sharing: Variable, depending on nature of the project.

Repayment Requirements(s): For loans, interest rates are near Treasury rates and may be repaid up to 30 years (loans are made through Farm Service Agency).

Application Procedure(s): Sponsors must follow state-developed procedures for coordination of proposed Federal financial assistance and must notify the state's Single Point of Contact for Federal Assistance of their intent to apply for assistance under Public Law 83-566.

Programmatic/Funding Constraint(s): A watershed or subwatershed area may not exceed 250,000 acres. No structure providing more than 12,500 acre-feet of floodwater detention capacity or more than 25,000 acre-feet of total capacity may be included in a plan. Each project must contain benefits directly related to rural communities, including agricultural related enterprises, that account for at least 20 percent of the total benefits of the project. Project sponsors must be willing to carry out all phases of project installation, operation, and maintenance and have the financial ability for meeting their full responsibilities with relation to the project. Funds must be available for project installation.

Of the $101 million in FY 1998 funds, roughly half is available for technical assistance, with the remainder going for financial assistance. Some of the funds may already be committed to projects approval and initiated in earlier years. A competitive ranking process is used for selecting those projects with the highest environmental and economic net benefits.

Aquatic Ecosystem Restoration

(Section 206 of the Water Resources Development Act of 1996)

Objective: *To carry out aquatic ecosystem restoration projects that will improve the quality of the environment, are in the public interest, and are cost-effective.*

Agency: U.S. Army Corps of Engineers (Corps)

Link to Non-Structural Alternatives: This program focuses on designing and implementing engineering solutions that restore degraded ecosystems to a more natural condition.

Form of Assistance: The Corps will carry out the study and implement the project in conjunction with a non-Federal sponsor.

Program Target: State, tribal, and local governments.

Eligibility Requirement(s): State, tribal, or local governments. Ecosystem restoration benefits that justify the cost.

Total Annual Funding: The program has an annual total program limit of $25 million. The FY 1998 appropriation was $6 million.

Cost-Sharing Requirement: Non-Federal interests must contribute 35 percent of the cost of construction, and 100 percent of the cost of operation, maintenance,-replacement, and rehabilitation.

Repayment Requirement(s): None.

Application Procedure(s): Potential project sponsors may contact the appropriate Corps office. If the project appears eligible, the Corps will provide preliminary information, including a letter of intent from the non-Federal sponsor, through Corps channels for review and approval of funding for report preparation. The letter of intent indicates the sponsor understands the process, cost-sharing requirements, and estimated cost of the proposed project.

Application Timeline: May be done at any time, subject to availability of resources.

Programmatic/Funding Constraint(s): Individual projects are limited to $5 million in Federal cost.

Regional Contacts:

Division	Office	Phone Number
North Atlantic	Chief of Planning	(212) 264-7111

Watershed Surveys and Planning

Objective: *Watershed Surveys and Planning studies are for appraising water and related land resources and formulating alternative plans for conservation use and development. Generally, studies are of limited scope and short duration to provide specific information needed for planning.*

Agency: Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)

Contact: National Headquarters Office, Washington, D.C., (202) 690-0848. Herkimer County NRCS (315) 866-2520.

Link to Non-Structural Alternatives: Watershed Surveys and Planning can provide technical planning assistance in developing non-traditional flood recovery and floodplain management strategies plans may include management and land treatment measures, nonstructural measures, structural measures or combinations thereof that would meeting existing and projected needs and objectives.

Form of Assistance: Technical assistance to Federal, regional, state and local governments who have he responsibility for planning and developing water and related land resources.

Program Target: Federal, regional, state and local governments.

Total Funding: $11.1 million appropriated in FY 1998

Eligibility: Applicant must be an entity of Federal, regional, state, or local government.

Cost Sharing: None.

Repayment Requirements(s): None.

Application Procedures(s): Formal written request from appropriate entity of government to NRCS itate Conservationist.

Application Time Line: None.

Programmatic/Funding Constraint(s): Funding must be available for studies. Activities must deal with specific needs of the requesting agency and are to be consistent with the mission and the responsibilities of the U.S. Department of Agriculture. Some of the funds may already be committed o surveys approved and initiated earlier.

Emergency Watershed Protection Program (EWP)

Objective: *The Natural Resources Conservation Service provides technical and financial assistance to local sponsors for the relief of imminent hazard and reduction of the threat to* life *and property.*

Agency: Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)

Contact: National Headquarters Office, Washington, D.C., (202) 690-0848. Herkimer County NRCS (315) 866-2520.

Link to Non-Structural Alternatives: The EWP program provides assistance to reduce hazards to life and property in watersheds damaged by severe natural events. Emergency work includes establishing quick vegetative cover on denuded land, sloping steep land, and eroding banks; opening dangerously restricted channels; repairing diversions and levees; and other emergency work. The emergency area need not be declared a national disaster area to be eligible for technical and financial assistance. Emergency watershed protection is applicable to small scale localized disasters as well as disasters of national magnitude.

The Food and Agriculture Improvement and Reform Act (Farm Bill) of 1996 contains language that authorizes the purchase of floodplain easements as an emergency measure under the EWP program. The purchase of floodplain easements can retire land from frequent flooding to preclude federal disaster payments, retire land to allow levee setbacks, or limit the use of the land. This new tool provides an opportunity to purchase easements when the long-term cost of the easement is less than repeated repairs to the same land.

Areas eligible for floodplain easement purchase include non-urban low-lands, which are predominantly cropland, grazing land, hayland, or forest land, that lie adjacent to channels of a river, streams, watercourse, lake, or ocean and have been subject to flood damage.

Form of Assistance: Technical and financial assistance to state government, local units of government, and individuals.

Program Target: Individual landowners.

Total Funding: Funds provided through emergency supplemental appropriations only. Amount varies depending on magnitude of the disaster. FY 1998 supplemental funding was $80 million.

Eligibility:

• *Eligible person:* Must be the owner of the eligible property for at least the previous 12 months.
• *Eligible land:* Non-urban low-lands, which are predominantly cropland, grazing land, hayland, or forest land, that lie adjacent to the channel of a river, stream, watercourse, lake, or ocean and have been subject to flood damage.

Cost Sharing: Federal share is 100 percent of the easement value and the administrative cost associated with obtaining the easement; 100 percent of technical assistance; and 75 percent of other eligible measures.

Repayment Requirements(s): None.

Application Procedures(s): The application to participate must be filed with the local NRCS field office during an announced submission period.

Application Time Line: Announced period.

Programmatic/Funding Constraint(s): None.

Wetlands Protection - Development Grants

Objective: To *support development and enhancement of state and tribal wetland protection programs.*

Agency: Environmental Protection Agency (EPA)

Contact: EPA Wetlands Hotline, (800) 832-7828. Up-to-date regional contacts and current grant information is available through the EPA Wetlands Hotline.

Link to Non-Structural Alternatives: Grants can fund wetland protection and restoration through state or tribal government programs.

Form of Assistance: Grants.

Program Target: States and Federally recognized Native American tribes.

Total Funding: $15 million appropriated in Federal FY 1998 budget.

Eligibility: State and tribal agencies, and interstate and intertribal entities and associations.

Cost-Sharing: Sponsor required to provide 25 percent of total cost.

Repayment Requirement(s): None.

Application Procedure(s): Application forms can be requested from and submitted to the appropriate EPA Regional office. Each Regional office establishes its deadline.

Application Time Line: 4 months.

Programmatic/Funding Constraint(s): (1) Funds must be used to develop new or refine existing state or tribal wetland protection programs, (2) State and tribal agencies, and interstate and intertribal entities and associations are eligible, (3) some funds can be passed through by the grant recipient to ether entities, but the grant recipient must have a major role in the project, and protect wetland resources.

Other Comments: Funds can be used for identification, but not purchase, of flood easements, & cannot be used for relocation of farm/urban structures or to support construction activities.

Wetlands Reserve Program

Objective: *Provides owners of eligible land an opportunity to offer an easement for purchase*

Agency: Department of Agriculture (USDA), Commodity Credit Corporation

Contact: National Headquarters Office, Washington, D.C., (202) 690-0848. Herkimer County NRCS (315) 866-2520.

Link to Non-Structural Alternatives: Program can purchase easements from landowners to protect end restore wetlands.

Form of Assistance: Financial and technical assistance to restore wetlands.

Program Target: Private landowners.

Total Funding: 212,000 acres or approximately $180 million nation-wide (FY 1998)

Eligibility: One-year ownership and have farmed wetlands, or prior converted wetlands.

Cost-Sharing: Federal government will provide not less than 75 percent cost-share for restoration, plus lump sum payment for easement.

Repayment Requirement(s): None.

Application Procedure(s): Landowner must submit an intention to enter into the program through Natural Resources Conservation Service (NRCS) field office. NRCS, in consultation with the U.S. Fish and Wildlife Service, will determine land eligibility and develop a wetland reserve plan of operation for the acres that are eligible, and are selected through a bidding process.

Application Time Line: Continuous sign-up.

Programmatic/Funding Constraint(s): One-third acres enrolled in permanent easements, 1/3 in 30-year easements, and 1/3 in restoration cost-share agreement.

North American Wetland Conservation Fund

Objective: *Provides Federal cost-share funding to stimulate public private partnerships to protect, restore, and manage a diversity of wetland habitats for migratory birds and other wildlife. The program also helps maintain the proper distribution and abundance of migratory birds. The program provides matching grants for protection and restoration of wetland ecosystems in the United States, Canada, and Mexico.*

Agency: Department of the Interior (DOI), Fish and Wildlife. Service (FWS)

Contact: North American Waterfowl and Wetlands Office, (703) 358-1784

A list of all State/Regional Coordinators is available from the National Coordinator upon request. Information is also available on the Internet at http://www.fws.gov

Link to Non-Structural Alternatives: The Program emphasizes public/private partnerships to protect and restore wetland habitats.

Form of Assistance: Grants.

Program Target: Individual landowners, businesses, state and local governments.

Total Funding: $12 million nationwide in FY 1998.

Eligibility: Any agency, group, or individual involved in the acquisition, restoration, enhancement, and Management of wetland ecosystems/other habitat for migratory birds and other fish and wildlife.

Cost-Sharing: At least 50 percent non-Federal.

Repayment Requirement(s): None.

Application Procedure(s): Grant applicants can be sent to the North American Waterfowl and Wetlands Office, 4401 N. Fairfax Drive, Room 110, Arlington, VA 22203.

Application Time Line: Grant proposals are due the first Friday in April and August of each year.

Programmatic/Funding Constraints: There are more project proposals than can be funded with available resources.

Other Comments: Funds are distributed nationwide based on quality of proposals submitted yearly.

Beneficial Uses of Dredged Material

(Section 204, Water Resources Development Act of 1992, as amended)

Objective: *Provides for projects that protect, restore, and create aquatic and ecologically related habitats, including wetlands, in connection with dredging an authorized Federal navigation project.*

Agency: Department of Defense (DoD), U.S. Army Corps of Engineers (Corps)

Link to Non-Structural Alternatives: May be used in connection with post-flood dredging of navigation projects to create, restore or protect wetlands.

Form of Assistance: The Corps will carry out the study and implement the project in conjunction with a non-Federal sponsor.

Program Target: Native American, State, or Local Governments with the capabilities to meet the cost sharing requirements.

Eligibility Requirement(s): Non-Federal sponsor required.

Total Annual Funding: There is an annual appropriations limit of $15 million, Corps-wide. The FY 1998 appropriation was $2 million.

Cost-Sharing Requirement: Non-Federal sponsors are responsible for 25 percent of the incremental project cost over the cost of the dredging in the most cost effective way consistent with economic, engineering, and environmental criteria. This includes any necessary lands, easements, rights-of way, and relocations, and 100 percent of the incremental cost of operation, maintenance, replacement, and rehabilitation.

Repayment Requirement(s): None.

Application Procedure(s): Potential project sponsors may contact the appropriate Corps office to discuss section 204 opportunities. If the project appears eligible, the Corps would provide preliminary information, including a letter of intent from the non-Federal sponsor, through Corps channels for review and approval of funding for report preparation. The letter of intent indicates that the sponsor understands the process, cost-sharing requirements and estimated cost of the
proposed section 204 project.

Application Timeline: May be done at any time.

Programmatic/Funding Constraint(s): The program limit is $15 million in annual appropriations.

Other Comments: Implementation of these projects requires close coordination with planned dredging schedules. This can be difficult in an emergency situation.

Regional Contacts:

Division	Office	Phone Number
North Atlantic	Chief of Planning	(212) 264-7111

Partners for Fish and Wildlife

Objective: *Provides financial and technical assistance to private landowners interested in restoring wetlands and riparian habitats on their land. The program uses a non-acquisition approach to voluntary habitat restoration on private lands.*

Agency: Department of the Interior (DOI), Fish and Wildlife Service (FWS)

Contact: National Coordinator, Ecological Services, (703) 358-2201.

Link to Non-Structural Alternatives: Landowners in the watershed receive, on a voluntary request basis, technical and financial assistance to restore as many drained wetland and degraded riparian and instream habitats in the watershed as possible, as well as technical assistance in restoring floodplain habitats.

Form of Assistance: Grants and technical assistance.

Program Target: Individual land owners, businesses, local government.

Total Funding: $24 million nationwide in FY 1998.

Eligibility: Landowners enter into a binding agreement with the FWS to restore and protect the site. At a minimum, agreements are for 10 years; however, landowners with intention to protect the area perpetually are given higher priority for funding. The program is targeted at restoring wetland and riparian (streamside), and instream habitats.

Cost-Sharing: The cost sharing agreement is negotiated. The FWS can cost share with the USDA, crate agencies, conservation organization, etc, to minimize landowner expenditures.

Repayment Requirement(s): If the landowner decides to return the restoration site to agricultural or other intensive use prior to the expiration of the agreement, the landowner must refund FWS contribution to the project.

Application Procedure(s): Contact the State Coordinator who will arrange for a site visit and plan development (often working closely with the local Natural Resource Conservation Service representative). Landowner then applies for cost-sharing. If approved, the landowner would implement the restoration plan. The FWS verifies project completion and provides the agreed upon cost share.

Application Time Line: Projects submitted early in the fiscal year (which runs from October 1
-September 30) have a better chance at receiving funding than projects submitted late in the year. Financing is generally available in less than six months from when the application is approved.

Programmatic/Funding Constraints: Grant funds must be obligated within a single fiscal year.

Other Comments: The Partners for Fish and Wildlife Program has assisted over 16,000 landowners in projects that have restored over 360,000 acres of wetlands and 930 miles of riparian habitat.

Rivers, Trails and Conservation Assistance Program

Objective: *Program provides National Park Service staff assistance to communities for river and trail corridor planning and open space preservation efforts. Program personnel facilitate cooperative planning efforts; projects are all based on substantial involvement of varied community interests.*

Agency: Department of the Interior (DOI), National Park Service (NPS)

Contact: Manager, Rivers and Watersheds Program, National Office, (202) 565-1175

Link to Non-Structural Alternatives: Program staff can work with interested communities to help hem identify non-structural options and set goals. Targeted NPS assistance with grassroots planning ;an help communities make informed choices, based upon consensus, about future growth and development that will help avoid future flood losses.

Form of Assistance: Staff consultants and technical assistance. No grants are available.

Program Target: State and local governments and not-for-profit groups.

Total Funding: $7.0 million appropriated in FY 1998.

Eligibility: State-local and public-private partnerships are required.

Cost-Sharing: Variable, usually in-kind services. No grant funds are available.

Repayment Requirement(s): None. No grants are made.

Application Procedure(s): Contact the National office. Formal application is prepared with NPS assistance after consultation.

Application Time Line: Deadline is generally August 1 for project work in the following fiscal year.

Programmatic/Funding Constraint(s): General limit of 2 to 3 work months per project.

Conservation Contracts

Objective: *To reduce the debt of delinquent and nondelinquent borrowers in exchange for conservation contracts placed on environmentally sensitive real property that secures Farm Service Agency loans.*

Agency: Department of Agriculture (USDA), Farm Service Agency (FSA)

Contact: Farm Loan Programs, National Office, (202) 720-1976. Herkimer County FSA (315) 866-2520.

Link to Non-Structural Alternatives: Sets up conservation contracts for conservation, recreational, and wildlife purposes on farm property that is wetland, floodplain, wildlife habitat, upland, or highly erodible land.

Form of Assistance: FSA can forgive debt from FSA Farm Loan Programs loans that are secured by real property, in exchange for conservation contracts on environmentally sensitive portions of a borrower's property. A conservation contract may be obtained for a period of not less than 50, 30, or 10 years. The amount of debt canceled is directly proportional to the term of the contract.

Program Target: Individual land owners.

Total Funding: No explicit funding limit, since the authority required to establish conservation contracts already exists in FSA's regulation.

Eligibility: Both current and delinquent FSA borrowers with loans secured by real estate are eligible to participate in the conservation contract program. The contracts can be established for conservation, recreational, and wildlife purposes on farm property that is wetland, floodplain, wildlife habitat, upland, or highly erodible land. Non-program borrowers are not eligible to participate in this program.

Cost-Sharing: None. The amount credited to a FSA borrower's account will be applied on the loans as an extra payment in order of lien priority on the security.

Repayment Requirement(s): Except as necessary to meet the requirements stated in the contract, the landowner is not obligated to take any action or to incur any expense related to the maintenance or restoration of the contract area. In the event of violations of terms and conditions of the contract, the USDA may utilize such administrative, civil, or criminal remedies as may be available under applicable law. The landowner may be liable for the costs of enforcing the terms and conditions of the contract including litigation expenses, and repair or restoration of the contract area.

Application Procedure(s): Interested borrowers should contact their local FSA office. The local FSA office will assist the borrower in the application process. The FSA official in conjunction with the contract review team will determine whether or not the borrower is eligible to receive a contract.

Application Time Line: The estimated time from application to the completion of the contract process is 60-90 days. The length of time which is required to perform functions such as appraisals, surveys, and title opinions will have a direct impact on the time required to complete the contract process.

Other Comments: Exchanging conservation contracts for debt reduction could provide an economical mechanism to establish floodplain and watershed protection measures that will reduce damage caused by similar flood events in the future. Establishment of conservation contracts may be viewed as economically and environmentally preferable to repairing flood-damaged farm lands. Therefore, before disaster assistance funds are expended on repair of damaged farmland that secures FSA loans, the landowner should be apprised of the opportunity to reduce their FSA debt in exchange for conservation contracts.

APPENDIX E

SELECTION OF
FLOOD HAZARD MITIGATION ALTERNATIVES

Basin: ___Steele Creek____ **Municipality(s):** German Flatts (T), Ilion (V), Litchfield (T) Columbia (T), Frankfort (T), Winfield (T).

SELECTION OF FLOOD HAZARD MITIGATION ALTERNATIVES

The municipalities referenced above have considered the following alternative techniques for reducing flood damages. The alternatives that are checked include those techniques that were selected as being potentially feasible within the subject basin. Unless otherwise specified, these solutions are proposed to be applied within the entire basin.

TECHNIQUES FOR "MANAGING THE USE OF LAND"

LOCAL LAND USE CONTROLS: *(See also: "Techniques for Preserving and Restoring Natural Resources" and "Infrastructure Protection")*

Development Policies

- __✳__ Develop or revise a Community Comprehensive Plan
- __✳__ Separate policy and design guidelines for (utility siting / erosion / essential facilities / drainage / open space / other)
- _____ Other: _____

Floodplain Regulations

- __✳__ Update Local Flood Hazard Mitigation Law
- _____ Revise law to require building elevation at least 2 feet above base flood elevation
- _____ Revise law to include additional flood-prone areas
- _____ Training for local officials (Code Enforcement Officer, Planning Board, etc.)
- __✳__ Updates to Flood Insurance Rate Maps (restudy, amend, or revise)
- _____ Require that all new buildings in and out of the designated floodplain be elevated above historic high water levels
- _____ Other: _____

Conventional Land Use Regulation

- __✳__ Low-density zoning
- __✳__ Clustering Provisions
- _____ Depth restrictions for basements
- __✳__ Standards for private bridges
- __✳__ Standards for driveways and driveway culverts
- _____ Maximum lot coverage for impervious surfaces
- _____ Other: _____

Subdivision Regulation

- _____ Require that each lot include a safe building site at an elevation above selected flood heights (either by a lot layout that enables out-of-the-floodplain construction or by filling a portion of each lot).
- _____ Require placement of streets above selected flood protection elevations

_____ Require placement of public utilities above selected flood protection elevations
_____ Prohibit encroachment of floodway
_____ Require that flood hazard areas be shown on plat
_____ Require adequate drainage facilities
_____ Other: _____

ACQUISITION AND RELOCATION:

Relocation

__✳__ Relocation of building(s) from *floodplain areas*
_____ Other: _____

Acquisition

_____ Acquisition of undeveloped flood-prone property at _____
_____ Acquisition and demolition of buildings at _____
__✳__ Acquisition of development rights or easements at *property bordering the creek corridor for development of a greenway corridor*
_____ Other: _____

FLOODPROOFING:

Floodproofing of Buildings and Retrofitting

__✳__ Elevate (~~Existing~~ / New) Buildings
__✳__ Distribute information about floodproofing techniques
__✳__ "Dry" Floodproofing (~~Existing~~ / New) Buildings
__✳__ "Wet" Floodproofing (~~Existing~~ / New) Buildings
__✳__ Barriers
_____ Technical assistance
_____ Financial assistance
_____ Other: _____

Infrastructure Protection

__✳__ Design standards for new or replaced bridges and culverts
_____ Mitigation of existing problems at _____
__✳__ Debris removal when problems occur
__✳__ Routine inspection and maintenance
_____ Other: _____

TECHNIQUES FOR "PREPARING FOR, RESPONDING TO, AND RECOVERING FROM A FLOOD"

HAZARD MITIGATION PLANNING:

Floodplain Management Plan

- __✳__ Develop and adopt a floodplain management plan (flood hazard mitigation plan)
- _____ Develop an All Hazards Mitigation Plan

Enhanced Mapping

- __✳__ Develop new mapping of floodway delineation and elevations.
- __✳__ Map "Special Hazard" areas (ice jams, areas of erosion, etc)
- __✳__ Map non-developable open space areas
- _____ Model and map future conditions hydrology
- __✳__ Implement a computerized "Flood Data Management System"
- __✳__ Digital mapping of real property data and/or other GIS information

Early Warning System

- __✳__ Rain gauges (Automated gauges /Volunteer reporting)
- __✳__ Stream/river level gauges (Automated gauges / Staff (ruled) gauges)
- _____ Local flood forecast center (operated by Environmental Emergency Services)
- __✳__ Automated Call-up ("Reverse 911")
- _____ Other: _____

Flood Response

- _____ Flood stage forecast maps
- __✳__ Local (~~municipal~~ / basin) Emergency Response Plan (including command structure, communication procedures, emergency flood proofing measures, evacuation procedures, etc.)
- _____ Staff Training (i.e. Emergency Management Institute)
- _____ Other: _____

Critical Facilities Plan

- __✳__ Protection or relocation of critical facilities (sites with toxic materials, medical facilities, emergency operation centers, utilities) _____
- _____ Emergency plan for critical facilities _____
- _____ Other: _____

PUBLIC OUTREACH AND EDUCATION:

Information about Flood Insurance Rate Maps

- __✳__ Availability of floodplain maps in municipal buildings
- __✳__ Map determinations (flood zone for a particular property or structure)
- __✳__ Publicize the availability of maps and FHA determination services
- __✳__ Provide information about additional locations with known flood problems (riverine flooding, shallow water table, bank erosion, etc.)

_____ Other: _____

Flood Hazard Insurance

__✳__ Education of property owners about insurance
__✳__ Education of insurance agents, mortgage lenders, and real estate agents
__✳__ Community Rating System Application (to reduce insurance premiums)
_____ Other: _____

Flood Information Outreach Projects

__✳__ Develop a Public Information Strategy (See: CRS Guidance)
__✳__ Newsletter article in *Evening Telegram*
__✳__ Enclosure in utility bill
__✳__ Direct mailing to (~~residents in FHA /~~ All residents)
__✳__ Workshops/training
_____ Special outreach project (i.e. Flood Awareness Week)
_____ Other: _____

Real Estate Disclosure

__✳__ Education of and Brochures to potential property buyers
__✳__ Disclosure by real estate agents
__✳__ Mandatory disclosure via local regulation
_____ Other: _____

Flood Protection References at Public Library

__✳__ Current Flood Insurance Rate Maps
__✳__ Past Flood Insurance Rate Maps
__✳__ Flood insurance information
__✳__ Information about protecting buildings from flooding
__✳__ Documents on community floodplain management and flood hazard mitigation
__✳__ Information about the natural and beneficial functions of floodplains
__✳__ Directory of sources for additional information on these topics
_____ Other: _____

Provide Technical Assistance

_____ Inform residents about flood hazards and ways to reduce damage
_____ Site-specific information about historic flood events
_____ Names of contractors and consultants knowledgeable or experienced in retrofitting techniques and construction
_____ Material on how to select a qualified contractor and what recourse people have if they are dissatisfied with a contractor's performance
_____ Site visits to review flooding, drainage, and sewer problems or provide advice on contemplated development
_____ Advice and assistance on retrofitting techniques
_____ Publicize the availability of Technical Assistance.
_____ Other: _____

Environmental Education

_____ Education programs for children
_____ Education programs for adults

_____ Other: _____

RECORD KEEPING:

Municipal Files

__✳__ Current Flood Insurance Rate Maps
__✳__ Maintain file of Elevation Certificates
__✳__ Past Flood Insurance Rate Maps
__✳__ Local accounts of past flood events

Benchmarks

__✳__ Maintain elevation reference marks

FINANCIAL PLANNING:

Revenue

__✳__ Flood Mitigation Activities as part of capital improvement program and budget
__✳__ District Formation / Impact Fees
__✳__ Grant Research and Application

Incentives

_____ Tax Incentives / Property Credits
__✳__ Flood Insurance (participation in CRS Program)

Cost Savings

__✳__ Shared services among adjoining communities

TECHNIQUES FOR "PRESERVING AND RESTORING NATURAL RESOURCES"

Wetland Protection and Enhancement

_____ Protect existing wetlands at _____
_____ Enhance existing wetlands at _____
_____ Create new wetlands at _____
__✳__ Other: *More stringent local wetland regulation*

Open Space Preservation

__✳__ Stream setback requirement
__✳__ Vegetated buffer strips along _____
__✳__ Agricultural districts
__✳__ Parks, preserves, or recreation areas _____
_____ Transferable development rights
__✳__ Land use/conservation easements _____
_____ Deed restrictions
_____ Open Space Restoration
_____ Apply floodway development standards to wider area along _____
_____ Other: _____

Stormwater Management

- __✳__ Stormwater management plan for (Basin / Municipality)
- __✳__ Voluntarily Implement Six (6) Minimum Requirements for SPDES – Phase II Stormwater Program
- __✳__ Stormwater management regulations
- __✳__ Improvement to Water Quality
- __✳__ Education and technical assistance
- _____ Design and construction of regional stormwater management facilities ~~at~~ *in upstream areas*
  - _____ to address existing problems at _____
  - _____ in anticipation of future development at _____
- __✳__ Inspection and maintenance program for stormwater management facilities
- _____ Other: _____

Erosion and Streambank Stabilization

- __✳__ Channel/bank stabilization of _____
- __✳__ Erosion and sediment control of new development
- _____ Other: _____

Preservation and Maintenance of Drainageways

- __✳__ Local regulation of dumping in streams, ditches and drainageways
- __✳__ Line item in budget for drainage system maintenance
- __✳__ Debris removal when problems occur
- __✳__ Routine inspection and removal of debris ____ times per year
- _____ Written drainage system maintenance plan (specifying maintenance needs and responsibilities)
- __✳__ Establish a drainage district
- __✳__ Channel/bank stabilization on _____
- __✳__ Debris basin(s) on _____
- _____ Other: _____

TECHNIQUES FOR "CONSTRUCTING PROJECTS TO CONTROL FLOOD WATER"

Retention Structures

- ✳ New water retention structures in *sub-basins* watershed
- ✳ Ice control structure and retention near _____
- _____ Identify and maintain existing ponds and retention structures
- _____ Other: _____

Diversions

- ✳ High flow diversion channel at *ice control structures*
- _____ Other: _____

Channel Modifications

- _____ Removal of sand bars or islands from _____
- _____ Straightening, widening, or deepening of _____
- _____ Channel paving of _____
- _____ Other: _____

Levees and Floodwalls

- ✳ New levee/floodwall along *near electric sub-station*
- ✳ Increased protection of existing levee/wall along *near electric sub-station*
- _____ Maintain existing dike system
- _____ Other: _____

Storm Sewers

- _____ Storm sewer installation at _____
- _____ Increased storm sewer capacity at _____
- ✳ Inspection and maintenance of existing storm sewer at _____
- _____ Other: _____

APPENDIX F

SUMMARY OF FLOOD HAZARD MITIGATION ACTION ITEMS

Summary of Steele Creek Flood Hazard Mitigation Recommendations:

7.1 - STRUCTURAL SOLUTIONS ("Constructing Projects to Control Flood Waters")				
Recommendation	**Responsibility**	**Proposed Schedule**	**Priority**	**Expenditure**
7.1.1 - Improve Bridge Flow Capacity	Municipally initiated with multi-agency assistance (NYS DOT, DEC).	2005 and on-going	High	Moderate
7.1.2 - Sediment Control	Town of German Flatts and Town of Litchfield with multi-agency assistance (DEC, NRCS, SWCD, USACE).	2005 and on-going	High	High
7.1.3 - V-notch channel near Main St bridge	Village of Ilion with approval from DEC	2005 and on-going	High	Minimal
7.1.4 - Wall Extension	Village of Ilion with multi-agency assistance (DEC, NRCS, SWCD).	2005 and on-going	High	Moderate
7.1.5 - 1st St Dam Removal	Village of Ilion with multi-agency assistance (DEC, NRCS, SWCD).	2007	Low	Moderate
7.1.6 - Abandoned Railroad Bridge	Village of Ilion with multi-agency assistance (DEC, SWCD, Railroad)	2007	Low	Moderate
7.1.7 - Water Supply Reservoirs	Village of Ilion with multi-agency assistance (DEC, SWCD, Water Commission)	2007	Low	Low

7.2 - LAND USE MANAGEMENT ("Managing the Use of Lands to Reduce Impacts")				
Recommendation	**Responsibility**	**Proposed Schedule**	**Priority**	**Expenditure**
7.2.1 - German Flatts Land Use Controls	German Flatts Municipal Board with multi-agency assistance (HOCCPP, HCPB, DOS).	2004 - 2005 Comp Plan 2006-2007 Land Use Controls	High	Minimal
7.2.2 - Develop stormwater and Erosion Control Ordinances	All municipalities in basin with multi-agency assistance (HOCCPP, DEC, HCPB, DOS).	2005	High	Minimal
7.2.3 - Setbacks and Stream Buffers	All municipalities in basin with multi-agency assistance (HOCCPP, HCPB, DEC, SWCD, NRCS, DOS).	2006	High	Minimal
7.2.4 - Update Local Flood Damage Prevention Laws	Municipal Boards with multi-agency assistance (SEMO, DEC, HOCCPP).	2005	High	Minimal
7.2.5 - Acquisition and Relocation Program	Coordination primarily between the Village of Ilion and Town of German Flatts with multi-agency assistance (SEMO, FEMA).	2005 - 2006	High	High
7.2.6 - Develop Flood Proofing Program	Initiated by Town of German Flatts and Village of Ilionand geared toward property owners. Assistance from SEMO, FEMA, DEC.	2005 and on-going	High	Moderate

7.3 - PREVENTATIVE MEASURES ("Preparing for Floods")					
	Recommendation	**Responsibility**	**Proposed Schedule**	**Priority**	**Expenditure**
7.3.1	- Stream Gauges, Sensors and Monitors	All municipalities (especially those upstream) with multi-agency assistance (USGS, DEC, USACE, SEMO).	2005	High	Moderate
7.3.2	- Automated Early Warning System	Primarily the Town of German Flatts and Village of Ilion with multi-agency assistance (DEC, SEMO).	2005 and on-going	Medium	High
7.3.3	- Update Emergency Management Plans	All municipalities in basin with multi-agency assistance (SEMO, HC EMO).	2005 and on-going	Medium	Minimal
7.3.4	- Data Management System	Cooperation among multiple agencies with local input (HOCCPP, DEC, USACE)	2005 and on-going	Medium	Moderate
7.3.5	- CRS Participation and Public Education	Initiated by all municipalities within basin with Flood Hazard Areas and relying on multi-agency assistance (SEMO, FEMA, HOCCPP).	2005 and on-going	High	Moderate
7.3.6	- Maintenance Program for existing flood mitigation projects and structures	Primarily the Village of Ilion and Town of German Flatts with multi-agency technical assistance (DEC, NRCS, SWCD).	2005 and on-going	High	Minimal
7.3.7	- Financing and/or District Formation	All municipalities in the basin with multi-agency assistance (DEC, DOS, HOCCPP, Municipal Attorney).	2005 and on-going	High	Moderate

7.4 - NATURAL RESOURCE PROTECTION ("Preserving and Restoring Natural Resources")					
	Recommendation	**Responsibility**	**Proposed Schedule**	**Priority**	**Expenditure**
7.4.1	- Wetland Protection and Enhancement	Initiated by all municipalities within the basin with multi-agency assistance (NRCS, SWCD, DEC, USACE, HOCCPP).	2007	Low	Minimal
7.4.2	- Open Space and Recreation	Village of Ilion with multi-agency assistance (DEC, Canal Corp, NYS Office of Parks, NRCS, SWCD).	2005 and on-going	Medium	Moderate
7.4.3	- Streambank Stabilization throughout basin	Initiated by all municipalities within the basin with multi-agency assistance (DEC, SWCD, NRCS, HOCCPP).	2005 and on-going	High	Minimal to High
7.4.4	- Drainageway Maintenance Program	Primarily the Town of German Flatts, Town of Litchfield, and Village of Ilion with multi-agency technical assistance (DEC, DPW, DOT, NRCS, SWCD).	2005 and on-going	Medium	Moderate
7.4.5	- Greenway Development	Primarily the Town of German Flatts, Town of Litchfield, and Village of Mohawk with multi-agency technical assistance (DEC, HOCCPP, NRCS, SWCD).	2005 and on-going	Medium	Minimal