

Chapter 4: Recommendations

4.1 Overview of Goals and Strategies

The purpose of the Mohawk River Watershed Management Plan is to improve conditions in the watershed to protect and restore water quality and habitat throughout this 3,460-square-mile area of Central New York, while revitalizing waterfront communities and improving the quality of life for residents. Quality of life encompasses multiple dimensions; these include economic development, resilience to damaging storms and floods, food security, recreational opportunities, clean air, and an ample supply of clean water. Achieving the seven goals articulated by the Watershed Advisory Committee will be challenging and will require a coordinated effort at many levels, including federal, state and local governments, educational institutions, resource management agencies, not-for-profit organizations, and the public at large. As set forth in previous chapters, these seven goals are:

1. Protect and restore the quality and ecological function of water resources
2. Protect and enhance natural hydrologic processes
3. Promote flood hazard risk reduction and enhanced flood resilience
4. Protect, restore, and enhance fish and wildlife habitat
5. Revitalize communities and waterfronts and adopt smart growth land use practices
6. Promote agriculture and other working landscapes
7. Increase watershed awareness

Actions taken to achieve these goals will not only restore or protect the natural processes of a healthy watershed, but will also bring beneficial economic consequences to the communities within the watershed.

This chapter presents three general strategies that support goals for the Mohawk River Watershed: Implement Best Management Practices, Advance Municipal Actions, and Advance Collaboration and Partnerships. The first two strategies are proposed as a framework for organizing the recommendations for actions and practices. The third strategy encompasses the many parallel efforts by agencies and organizations working to build a better future and quality of life for communities in the watershed. The strategies are defined in terms of *components* that support goals for the watershed:

Strategy 1: Implement Best Management Practices. Implement best management practices to protect and restore natural hydrology, reduce erosion and sedimentation, minimize pollution, and protect and restore habitats.

Strategy 2: Advance Municipal Actions. Advance municipal actions to promote sustainability, reduce risk of flood damage, and revitalize communities and waterfronts through the adoption of appropriate zoning and land use policies to encourage cluster development, protect steep slopes, protect and enhance floodplains, reduce impervious surfaces, protect, restore or enhance unique and natural areas, riparian areas, and wetlands.

Strategy 3: Advance Collaboration and Partnerships. Advance collaboration and partnerships to promote sustainable communities, smart growth, economic development, and environmental quality through advancing collaboration and partnerships with the NYSDOS Local Waterfront Revitalization Program, Mighty Waters Working Group, NYSDEC Mohawk River Basin Action Agenda, New York Rising Community Reconstruction Program, and the Cleaner, Greener Communities Program.

In this chapter, the strategies and their components (e.g., minimize pollution) are developed into a set of detailed recommendations for practices and other actions that can be implemented in the watershed. The recommendations address current conditions of the natural and built environment, as presented in Chapters 2 and 3. Since each community and subwatershed faces unique conditions influencing water quality, hydrology and flooding, waterfront revitalization, community development, etc., many of the recommendations are discussed in terms of their relevance within each of the three main watershed regions and subwatershed areas within those regions. In Chapter 5: Implementation, Tracking, and Monitoring, the recommendations are presented in greater detail with consideration of location, cost, and implementation partners for various restoration and protection projects. The Mohawk River Watershed Management Plan will be a “living document” that is updated as actions and projects are implemented and new actions and projects are identified as necessary and incorporated into recommendations. These updates will be published on the [Mohawk River Watershed Coalition website](#) and reflected in the [Interactive Mapping Tool for the Mohawk River Watershed](#).

4.2 Strategy 1: Implement Best Management Practices

Implement best management practices to protect and restore natural hydrology, reduce erosion and sedimentation, minimize pollution, and protect and restore habitats.

Best Management Practices (BMPs) are effective, practicable actions or processes that can be implemented to support watershed goals. In this section, the BMP strategy is discussed first in terms of its components and their relationship to key watershed goals, and then in terms of specific recommendations that can be implemented in agricultural, developed, or all areas of the watershed. Finally, BMPs are discussed in terms of their relevance to regions and subwatersheds. The BMP recommendations were developed with input from SWCD staff, who were instrumental in developing this Watershed Management Plan. In Chapter 5, these BMPs are linked to specific projects that have been proposed or initiated by SWCDs throughout the watershed.

Many aspects of this strategy carry economic implications for watershed communities. For example, polluted waterbodies reduce recreational use and tourism, and cleansing or finding substitutes for water resources tends to be expensive. Aquatic as well as terrestrial invasive species not only degrade habitat for native species, but also detract from the economic value of the watershed, affecting agriculture and recreation, and can be very costly to control. The aesthetically attractive landscape of much of upstate New York—including the Mohawk River Watershed—is a well-recognized economic asset to the area. Finally, minimizing runoff that contributes to excessive stream flow can help reduce the frequency and intensity of localized flooding in the watershed, which carries an obvious economic benefit.

4.2.1 Strategy Component 1A: Implement BMPs to Protect and Restore Natural Hydrology

Restoring natural hydrology reduces the risk of flooding and its concomitant losses to agriculture and the built environment, and thus bears directly on the economic health of the communities within the watershed. As such, this BMP component for watershed health addresses the following goals of this Watershed Management Plan:

Goal 2: Protect and enhance natural hydrologic processes

Goal 3: Promote flood hazard risk reduction and enhanced flood resilience

Precipitation that falls on the landscape will follow diverse paths, depending on the intensity and duration of the precipitation and the suite of environmental conditions encountered. Water may run into streams, or be retained in lakes, ponds, or wetlands. It may seep into the ground and replenish aquifers. Storage in wetlands or percolation into the soil helps reduce the volume of water flowing across the land surface and into the surface network of streams and rivers, thereby reducing flooding. Extended contact with the soil and vegetation allows the absorption of harmful materials, mitigating their impact.

Human activities that modify surface drainage, disturb vegetative cover, and increase impervious surfaces will inevitably affect natural hydrology. Even in relatively undeveloped landscapes, periods of intense rainfall or rapidly melting snow can overwhelm the capacity of the surface drainage network and lead to flooding. The potential energy of flowing water, especially during storm conditions when velocity is high, can lead to erosion of the landscape with adverse impacts on the built environment and the loss of important resources. Therefore, many of the recommendations aim to replicate the natural hydrology of the Mohawk River Watershed and its subwatersheds. The USEPA has determined that well-planned, clustered, higher-density development reduces per-household storm-water run-off and allows for the natural management of water, thus reducing run-off pollution and disturbance of natural systems and habitats.¹

4.2.2 Strategy Component 1B: Implement BMPs to Reduce Erosion and Sedimentation

Reducing erosion and sedimentation improves water quality; restores in-stream habitats for fish and other organisms; supports the economies of waterfront and other watershed communities by reducing water-treatment costs and improving the aesthetic and recreational qualities of waterbodies; and supports agriculture by preserving valuable topsoil and the loss of streamside land. As such, this BMP component for watershed health addresses the following goals of this Watershed Management Plan:

- Goal 1: Protect and restore the quality and ecological function of water resources
- Goal 4: Protect, restore, and enhance fish and wildlife habitat
- Goal 5: Revitalize communities and waterfronts and adopt smart growth land use practices
- Goal 6: Promote agriculture and other working landscapes

A number of the recommended practices have the goal of retaining soil on the land and preventing its movement into waterways. Not only can erosion cause the loss of valuable topsoil, degrade streambanks and alter the course of streams, it carries silt and sediment into the water, making it turbid and reducing its quality. The subsequent deposition of suspended sediment alters aquatic habitats, adversely affecting organisms at multiple levels in the food web.

4.2.3 Strategy Component 1C: Implement BMPs to Minimize Pollution

Minimizing pollution restores water quality, improves fish and wildlife habitat, and supports communities faced with dealing with polluted waters. As such, this BMP component for watershed health addresses the following goals of this Watershed Management Plan:

- Goal 1: Protect and restore the quality and ecological function of water resources
- Goal 4: Protect, restore, and enhance fish and wildlife habitat
- Goal 5: Revitalize communities and waterfronts and adopt smart growth land use practices

¹ USEPA. 2006 (January). *Protecting Water Quality with Higher Density Development*. Available at http://www.epa.gov/dced/pdf/protect_water_higher_density.pdf.

Water pollution may be defined as any impairment of the suitability of water for any of its beneficial uses, actual or potential, by human-induced changes in the quality of the water.² It is sometimes useful to think of water pollutants in two broad categories: nutrients stimulate the growth of organisms in the water, especially algae and plants, which increases the turbidity of the water and may have other adverse effects; toxins—broadly construed—may be harmful to aquatic organisms or human health. Many of the recommendations aim to minimize the generation and movement of nutrients and other chemicals into the Mohawk River and its subwatersheds.

4.2.4 Strategy Component 1D: Implement BMPs to Protect and Restore Habitats

Habitats in and near streams are important in maintaining good water quality, providing an ecosystem service that might otherwise be expensive or impossible to duplicate. Inasmuch as water- and wildlife-based recreation is important to many communities in the watershed, protecting and restoring habitats also represents an investment in watershed communities. Therefore, this BMP component for watershed health addresses the following goals of this Watershed Management Plan:

Goal 1: Protect and restore the quality and ecological function of water resources

Goal 4: Protect, restore, and enhance fish and wildlife habitat

Goal 5: Revitalize communities and waterfronts and adopt smart growth land use practices

A successful watershed management planning effort must consider ways to improve and protect both terrestrial and aquatic habitats within the watershed. The presence of a healthy fishery, for example, requires not only the presence of the fish themselves, but the resources upon which the fish depend—a food web that sustains them with nutrients and energy, the plants and algae that replenish the oxygen in the water, and appropriate physical spaces in which to live and spawn.

The terrestrial environment is essential as well. Forests, for example, provide timber directly, but they also provide habitat for many beneficial terrestrial organisms. The quality of such habitat is reduced when the total area of habitat is reduced, as well as when habitats are fragmented. Creating corridors between otherwise fragmented areas of natural forest habitat improves their quality.

Terrestrial vegetation, including forest cover, is linked to the natural hydrology of the watershed. Forested riparian areas absorb runoff and restrict the direct flow of water and the sediment, nutrients and other chemicals it contains directly into streams. Through transpiration, forests also transfer water from the land into the atmosphere, and this can have a significant effect on the hydrology.

The advent of exotic, invasive species can also greatly degrade the quality of the watershed. Such species—plants or animals—are often capable of rapid proliferation and can crowd out or otherwise outcompete the native species. Some exotic invasive species are predators or parasites of native species and harm the native species directly. Some aquatic invasive species disrupt the food web or clog waterways to such an extent that boating or other water-based recreation is impossible.

² Warren, Charles E. 1971. *Biology and Water Pollution Control*. Philadelphia: W. B. Saunders Co.

4.2.5 Watershed-Wide BMP Recommendations

The Best Management Practices identified below are grouped in terms of their relevance to agricultural, developed/developing areas, or all areas of the watershed.³ A summary of these recommendations and their relationship to the strategy components for BMP implementation is shown in [Table 4-1](#), which follows the list of recommendations for BMP implementation applicable to all areas.

4.2.5.1 Agricultural Areas

Restore or create vegetated riparian buffer zones. Riparian buffer zones impede the direct runoff of water, allowing it to be absorbed and percolate into the ground or be taken up by the vegetation. Not only does this provide a buffer for the flow of water and reduce erosion, it also reduces the flow of pollutants from the landscape into waterways.

Restore wetlands. Like vegetated riparian zones, wetlands serve to buffer the flow of water and pollutants the water may carry directly into waterways. Wetlands serve as water storage areas, reducing the intensity of flooding, and they provide habitat for many wildlife species.

Improve animal feeding and waste operations and nutrient management programs. Animal feed and animal waste that find their way into waterbodies introduce nutrients that lead to eutrophication and reduced water quality.

Initiate or continue formal programs to reduce the impact of agriculture. Agricultural Environmental Management (AEM), prescribed grazing, and established soil erosion BMPs represent integrated strategies to reduce soil erosion and to prevent the export of nutrients from farms.

4.2.5.2 Developed Areas

Initiate green infrastructure, preserve green space, and decrease impervious surfaces. These strategies contribute to the management of stormwater in built-up areas by reducing the direct flow of water and pollutants that might otherwise be washed directly into streams. Application of natural processes like these to absorb stormwater also mitigates the risk of flooding and has an impact on the management of water quality. Examples of green infrastructure in developed areas include stream buffers, greenbelts, vegetative zones between impervious surfaces and storm sewers (including rain gardens), street trees, rooftop gardens, and permeable pavement. Examples of ways to decrease impermeable surfaces includes directing new development toward existing cities and villages, reducing parking lot and road width requirements, and allowing higher density development.

Improve floodplain development standards. In order to reduce the risk of damage to infrastructure and property from flood events, consider measures such as requiring increased setbacks and buffers, elevation of existing structures and infrastructure, and prohibition of septic tanks in the floodplain.

Incorporate/apply/incentivize/reward smart growth. Smart growth is a holistic approach to planning aimed not only toward improving water quality—partly by preserving green space and reducing per capita impervious surfaces—but also toward reducing auto dependence, reducing greenhouse gas emissions and other air pollutants, reducing infrastructure costs, and developing livable communities more conducive to physical and social wellbeing. The essential principals of smart growth include creating development patterns that are compact and include a mix of land uses in close proximity. Streets are designed to interconnect in a system of short blocks, which accommodate walking, biking, transit and the automobile. Smart growth also promotes a balance between private

³ Some of these BMPs are relevant for municipalities and are thus related to components of Strategy 2, Municipal Actions.

property and the shared space of the public realm. These principles can be actively advanced at the municipal and regional level.

Implement stormwater management plans. Municipal Separate Storm Sewer Systems (MS4s) are stormwater collection systems (not associated with sanitary sewerage systems) that discharge into a waterbody. Urbanized areas subject to the USEPA's MS4 program are required to develop a program to reduce the transport of pollutants via storm sewers.

Address combined sewer overflows. In certain older municipalities, a single sewerage (piping) system collects both sanitary and stormwater and directs this flow to a wastewater treatment plant. During periods of intense precipitation the capacity of the wastewater collection system is exceeded, and a mixture of stormwater and sanitary sewage is discharged to the waterways through relief points in the collection system called combined sewer overflows. Remedial measures include separating the stormwater collection system from the sanitary system, installing storage capacity, or adopting green infrastructure measures designed to reduce the peak rate of stormwater runoff.

4.2.5.3 All Areas

Address failing septic systems near streams and lakes and promote tertiary treatment to remove phosphorus at WWTPs. These strategies are aimed at reducing the load of nutrients discharged to waterbodies in the watershed. Throughout the northeastern US, phosphorus loading is the principal cause of eutrophication and its concomitant impact on water quality. Secondary treatment at WWTPs typically removes organic matter and pathogens, but removal of phosphorus and other specific nutrients requires tertiary treatment. Failing septic systems may contribute nutrients and pathogens to nearby waterbodies. Even well-maintained septic systems may be a source of nutrients, depending on their distance from waterways, the age of the system, and the characteristics of the soil matrix between the leach field and the receiving water.

Ensure compliance with SPDES permits. These permits regulate the discharge of pollutants from WWTPs and other point sources.

Improve Department of Public Works sand and salt storage facilities. Runoff from these storage facilities contributes to sediment load and salt content of receiving waterbodies.

Address legacy and transboundary contaminants (e.g., Superfund, Brownfield, mercury). Two Superfund sites have been identified in the Mohawk River Watershed. These areas are regulated under the USEPA program to clean up the nation's worst hazardous waste sites. Some developed areas in the Mohawk River Watershed contain Brownfield sites, former industrial or storage areas where chemical pollutants have infiltrated the soil, serving as an actual or potential source of pollution for surface and/or groundwater. Reclaiming or restoring such sites will contribute to improved water quality.

Reduce streambank erosion through natural stream design methods. Reducing streambank erosion reduces both the sediment load added to the stream and the damaging effects on the surrounding landscape.

Protect drinking water supplies. Both surface water and groundwater serve as drinking water sources for people in the watershed. Specific actions may be required to protect the quality and the quantity of flow of these sources.

Encourage forest management planning. The goal of this general recommendation encompasses maintaining healthy forests and ensuring sustainable sources of timber, as well as preventing erosion and the resultant water quality impairment.

Protect wetlands and wildlife management areas. Protecting these areas preserves habitat for resident flora and fauna and reduces the risk that invasive species will become established. In addition, intact wetland and upland ecosystems promote natural hydrology and prevent soil loss by erosion.

Best Management Practices recommendations that can be applied watershed-wide are presented in [Table 4-1](#). Some of the BMPs were not included in the discussion.

**TABLE 4-1
BMP Recommendations to Support Watershed Management Goals**

BMP Recommendation	Targeted BMP Component			
	Protect & Restore Natural Hydrology	Reduce Erosion & Sedimentation	Minimize Pollution	Protect & Restore Habitats
Agricultural Areas				
Restore/increase riparian buffers	X	X	X	X
Restrict animal access to streams		X	X	
Restore/protect wetlands	X	X	X	
Continue AEM programs		X	X	
Expand nutrient management programs			X	
Promote prescribed grazing		X		
Improve animal feeding and waste operations			X	
Implement soil erosion BMPs		X		
Developed Areas				
Implement stormwater management practices	X			
Implement green infrastructure practices	X			
Preserve green space	X			X
Address legacy/transboundary contaminants (e.g., Brownfields, Superfund, mercury)			X	
Address Combined Sewer Overflow issues			X	
Encourage smart growth	X			X
Increase pervious surfaces	X			
All Areas Watershed-Wide				
Address failing septic systems near waterbodies			X	
Protect drinking water supplies	X		X	
Reduce streambank erosion w/ natural design	X	X		
Ensure compliance w/ SPDES permits			X	
Promote advanced phosphorus removal at WWTPs			X	
Encourage forest management planning		X		X
Improve DPW sand and salt storage facilities			X	
Protect wildlife management areas				X
Enhance in-stream habitat				X
Protect trout spawning waters				X
Regulate development along streams	X	X	X	
Seed drainage ditches to prevent erosion		X		
Quantify impacts of varying flow from reservoirs	X			X
Restore natural floodplains	X			
Manage invasive species				X

4.2.6 Specific BMP Recommendations for Regions

Members of the Coalition and project partners completed detailed assessments of the subwatersheds (classified by 12-digit HUC) to identify what actions might be required to address specific sources of water quality or habitat impairment in those areas. The following subsections summarize the recommendations by the three major watershed regions: Upper Mohawk, Main River, and Schoharie Watershed.

4.2.6.1 Upper Mohawk Region

The subwatersheds within the Upper Mohawk Region are summarized in [Table 4-2](#), and a summary of recommendations for this region is presented in [Table 4-3](#).

TABLE 4-2
Subwatersheds of the Upper Mohawk Region

10-Digit HUC	12-Digit HUC	
Middle West Canada Creek	Hinckley Reservoir Cincinnati Creek Conklin Brook	Fourmile Brook Mill Creek Headwaters of Black Creek
Lower West Canada Creek	Shed Brook White Creek	City Brook North Creek
Upper West Canada Creek	Headwaters of West Canada Creek Honnedaga Indian River South Branch West Canada Creek	Metcalf Brook Big Brook Vly Brook
Delta Reservoir	West Branch Mohawk River Lansing Kill Stringer Brook	Wells Creek Delta Reservoir
Oriskany Creek	Deans Creek Lower Oriskany Creek Middle Oriskany Creek	Upper Oriskany Creek Headwaters Oriskany Creek
Ninemile Creek	Headwaters Mohawk River Sixmile Creek Lower Ninemile Creek Middle Ninemile Creek Upper Ninemile Creek Wheeler Creek	Oriskany Battlefield Crane Creek Reall Creek Mud Creek Squoit (Roberts) Creek
Nowadaga Creek	Ferguson Creek Sterling Creek Moyer Creek Steele Creek Bridenbecker Creek	Crum Creek Nowadaga Creek Fulmer Creek Beaver Brook

Upper and Middle West Canada Creek

Much of the northern part of this watershed region lies within the Adirondack Park or otherwise largely in forested land. As a result, water quality here is, on the average, relatively good with high assessment scores.

Recommendations for these areas are therefore mostly directed at protecting the existing attributes that promote good water quality, protecting forested riparian buffer zones and controlling streambank erosion. Where timber harvesting occurs, it should be done employing best management practices to reduce erosion and the flow of

nutrients and sediment into watercourses. Where necessary, the in-stream habitat should be enhanced to maintain biological integrity and support fisheries. Failing septic systems along streams and lakes in this area should be repaired or replaced to prevent nutrient pollution of the water. Where agriculture occurs in these areas, agricultural BMPs should be employed to reduce erosion and the flow of nutrients and sediment into watercourses.

The Upper and Middle sections of West Canada Creek subwatersheds continue to suffer adverse impact from acid precipitation and atmospheric deposition of mercury, and Upper West Canada Creek is on the 303(d) list of impaired waterbodies for this reason. The only long-term solution is the reduction of emissions from coal-fired power plants in the Midwest.

Lower West Canada Creek and Delta Reservoir

Closer to the main stem of the Mohawk River agriculture intensifies and has a greater effect on water quality. Recommendations here aim to reduce erosion and prevent the movement of soil and nutrients into waterbodies. Maintaining or establishing riparian buffer zones, implementing soil erosion BMPs and maintaining or restoring wetlands. Animal feed and waste should be managed so as to reduce the runoff of nutrient-laden water into streams, and animal access to streams should be restricted.

Ninemile Creek, Oriskany Creek, and Nowadaga Creek

These subwatersheds lie along the main stem of the Mohawk River and in the heavily farmed upland areas to the south. In many of these agricultural areas, watershed health is compromised by soil erosion and runoff. Recommendations to restore watershed health in these areas are aimed at mitigating these negative impacts: creating or increasing riparian buffer zones, restoring wetlands and employing soil erosion BMPs. Managing animal feed and waste operations and keeping animals out of streams will reduce the nutrient load entering waterbodies and mitigate eutrophication.

The cities of Rome and Utica and other developed areas lie along the Mohawk River in these subwatersheds. Recommendations for these developed areas address the restoration of impaired waterbodies and elimination, or at least reduction, of point and non-point sources of pollution. Implementing stormwater management plans in MS4 communities and reducing impervious surfaces, perhaps by preserving or increasing green space, can reduce the flow of pollutants into waterbodies and help to ameliorate periodic flooding. Encouraging smart growth and implementing green infrastructure initiatives in Utica and Rome can reduce run-off and the flow of pollutants. Green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. It includes stormwater management systems that mimic nature by soaking up and storing water. These communities should also continue to address the issue of combined sewer overflows, which transport stormwater as well as untreated wastes into waterbodies during times of high rainfall or snowmelt.

Recommendations also include continuing to address issues associated with a number of brownfield sites and a Superfund site (the former Griffiss Air Force Base near Rome) that lie in this region. A number of stream segments in this area appear on NYDEC's 2012 Section 303(d) list of impaired waterbodies. Remedial actions to address these issues should be initiated or continued, and compliance with SPDES permits for facilities in these areas should be ensured.

A summary of the recommended BMPs for each of the HUC-10 subwatersheds in the Upper Mohawk Region is presented in [Table 4-3](#). These recommendations came from subwatershed assessment reports prepared by Mohawk River Watershed Coalition Soil and Water Conservation Districts, and as such the wording of the BMPs varies slightly from those listed in Table 4-1.

TABLE 4-3
BMP Recommendations for the Upper Mohawk Region

SUBWATERSHED (10-DIGIT HUC)	Recommendations to protect & restore natural hydrology (Strategy Component 1A)	Recommendations to reduce erosion and sedimentation (Strategy Component 1B)	Recommendations to minimize pollution (Strategy Component 1C)	Recommendations to protect & restore habitats (Strategy Component 1D)
Upper West Canada Creek	<ul style="list-style-type: none"> - Protect wetlands - Protect forested riparian buffers 	<ul style="list-style-type: none"> - Develop forest management planning - Stabilize streambanks 	<ul style="list-style-type: none"> - WWTP in Barneveld - Address failing septic systems 	<ul style="list-style-type: none"> - Enhance in-stream habitats
Middle West Canada Creek	<ul style="list-style-type: none"> - Protect wetlands - Protect forested riparian buffers 	<ul style="list-style-type: none"> - Employ forest management planning 	<ul style="list-style-type: none"> - Address failing septic systems - Apply agricultural BMPs 	
Lower West Canada Creek	<ul style="list-style-type: none"> - Restore/protect riparian buffers - Restore wetlands - Manage urban stormwater 	<ul style="list-style-type: none"> - Stabilize stream banks - Apply AEM 	<ul style="list-style-type: none"> - Apply AEM - Upgrade WWTPs - Address failing septic systems 	<ul style="list-style-type: none"> - Enhance in-stream habitats - Protect trout spawning water
Delta Reservoir	<ul style="list-style-type: none"> - Restore/protect riparian buffers - Restore wetlands - Work w/ Canal Corp. to stabilize water levels 	<ul style="list-style-type: none"> - Develop forest management planning - Stabilize streambanks - Stabilize steep slopes 	<ul style="list-style-type: none"> - Apply agricultural BMPs 	
Oriskany Creek	<ul style="list-style-type: none"> - Restore/protect riparian buffers 	<ul style="list-style-type: none"> - Stabilize streambanks w/ natural stream design - Employ soil conservation methods on farms 	<ul style="list-style-type: none"> - Apply agricultural BMPs 	
Ninemile Creek	<ul style="list-style-type: none"> - Enhance forested buffers - Restore/protect wetlands - Preserve green space - Employ control measures in MS4 communities - Employ green infrastructure - Redevelop vacant impervious surfaces 	<ul style="list-style-type: none"> - Develop forest management plans - Work w/ farmers on conservation plans - Encourage smart growth - Implement natural stream design 	<ul style="list-style-type: none"> - Address legacy contaminants (e.g., clean-up of Griffiss AFB) - Address CSO issues - Ensure compliance with SPDES permits 	<ul style="list-style-type: none"> - Protect wildlife management areas
Nowadaga Creek	<ul style="list-style-type: none"> - Install riparian buffers - Restore wetlands - Manage stormwater 	<ul style="list-style-type: none"> - Stabilize streambanks w/ natural stream design 	<ul style="list-style-type: none"> - Apply agricultural BMPs - Address 303(d) issues - Improve DPW sand and salt storage - Upgrade WWTPs to tertiary treatment for phosphorus 	

4.2.6.2 Main River Region

The subwatersheds in the Main River Region are summarized in [Table 4-4](#), and a summary of BMP implementation recommendations for this region is presented in [Table 4-5](#).

TABLE 4-4
Subwatersheds of the Main River Region

10-Digit HUC	12-Digit HUC	
Alplaus Kill	North Chuctanunda Creek South Chuctanunda Creek Sandsea Kill Poentic Kill Shakers Creek	Kayaderoseras Creek Evas Kill Indian Kill Stony Creek Headwaters Alplaus Kill
Fly Creek	Irish Creek Fly Creek Town of Esperance	Wilsey Creek Cripple Bush Creek
Cayadutta Creek	Headwaters Cayadutta Creek Auries Creek Flat Creek	Hall Creek Yatesville Creek Headwaters Flat Creek
Canajoharie Creek	Peck Lake North Creek Fort Plain-Otsquago Creek Middle Canajoharie Creek	Zimmerman Creek Mother Creek Lower Canajoharie Creek Upper Canajoharie Creek
East Canada Creek	Headwaters East Canada Creek Middle East Canada Creek Spruce Creek Middle Sprite Creek	Upper East Canada Creek Lower East Canada Creek Sprite Creek North Creek

East Canada Creek

The northeastern upland portion of the Main River region of the Mohawk River Watershed (East Canada Creek 10-digit HUC) lies largely within the Adirondack Park and has little agriculture and few developed areas. There are relatively few negative impacts on the environmental quality of this area, and the aim of recommended actions should be to protect the landscape from further degradation.

Forests and wetlands cover much of this area with expansive riparian buffer areas and few impervious surfaces. These conditions should be protected. With low population density, little agriculture and few sources of point or nonpoint pollution, there are few serious threats to water quality, and these conditions should be maintained.

The few WWTPs that are present should be upgraded to tertiary treatment to remove phosphorus. Failing septic systems near streams or lakes should be repaired or replaced. In-stream habitats should be maintained or improved where necessary and mechanisms for preventing the introduction of invasive species or their control, once introduced, should be instituted.

Canajoharie Creek, Cayadutta Creek, Alplaus Kill

Lying in lowland areas along the main stem of the Mohawk River, these areas are subject to intensive agriculture. They also have a long history of industrial, commercial, and residential development and contain the cities of

Amsterdam, Johnstown, Schenectady and parts of Albany. The principal aim of watershed management in these areas must be to mitigate the sources of degradation and restore environmental quality.

Actions that reduce runoff from the landscape directly into waterways will reduce erosion, impede the flow of pollutants, and reduce the risk of flooding. In agricultural areas, restoring or increasing riparian buffer zones and restoring wetlands serve to reduce runoff. Improving animal feeding and waste operations and expanding nutrient management programs reduce the flow of pollutants, especially nutrients, into streams, preventing eutrophication and the water-quality problems associated with it. Established programs for AEM, prescribed grazing and soil erosion BMPs should be implemented or expanded.

Developed areas in this Main River region have many impervious surfaces. As rain flows off these surfaces directly into waterways, it carries pollutants—road salt and sand, petroleum products, solid wastes, etc. Since the flow-buffering effect of percolation to the soil is prevented, variation in flow volume and the risk of periodic flooding is increased. Many recommended strategies for these developed areas are aimed at reducing runoff and the flow of the pollutants. Smart growth and green infrastructure principles that concentrate development in already developed areas, increase green spaces, increase development densities, and decrease road width and parking requirements, will serve to reduce and filter stormwater runoff. Communities with municipal separate stormwater systems must implement stormwater management programs that may include some of these elements.

Other recommendations for managing this region are aimed at reducing the generation and flow of pollutants into waterbodies. Combined sewer overflows, where they occur, should be managed or eliminated to prevent the flow of untreated sewage, and WWTPs should be upgraded to tertiary treatment to reduce phosphorus pollution, and SPDES permit conditions should be enforced. Failing septic systems near streams and lakes should be improved. There are a number of brownfields and a Superfund site (Johnstown Landfill) in this region as well, and programs to restore these areas should be continued.

Fly Creek–Schoharie Creek

This subwatershed comprises the lower reaches of Schoharie Creek up to its confluence with the Mohawk River. Although this subwatershed lies close to the main stem of the Mohawk River and drains directly into it, it has little industrial, commercial, or residential development. Agricultural land use, however, is relatively high, and recommendations for this area aim both to protect and to restore the subwatershed.

For agricultural areas, recommended management strategies to reduce runoff, control erosion and prevent the flow of pollutants into lakes and streams, are similar to those for agricultural areas in the Canajoharie Creek-Mohawk River, Cayadutta Creek-Mohawk River, Alplaus Kill-Mohawk River, discussed above.

In areas where the impact of agriculture or development is less, recommendations are directed toward protecting the natural qualities of the watershed. These include protecting vegetated riparian buffer areas, wetlands and wildlife management areas, reducing streambank erosion through natural stream design and addressing failing septic systems near lakes and streams.

A summary of the recommended BMPs for each of the HUC-10 subwatersheds in the Main River Region is presented in [Table 4-5](#). These recommendations came from subwatershed assessment reports prepared by Mohawk River Watershed Coalition Soil and Water Conservation Districts, and as such the wording of the BMPs varies slightly from those listed in Table 4-1.

TABLE 4-5
BMP Recommendations for the Main River Region

SUBWATERSHED (10-DIGIT HUC)	Recommendations to protect & restore natural hydrology (Strategy Component 1A)	Recommendations to reduce erosion and sedimentation (Strategy Component 1B)	Recommendations to minimize pollution (Strategy Component 1C)	Recommendations to protect & restore habitats (Strategy Component 1D)
Alplaus Kill	<ul style="list-style-type: none"> – Manage stormwater in MS4s – Restore forested riparian buffers – Restore wetlands – Educate homeowners re stormwater runoff – Employ green infrastructure – Decrease impervious surfaces – Encourage smart growth 	<ul style="list-style-type: none"> – Restrict animal access to streams – Employ forest management BMPs – Employ agricultural BMPs 	<ul style="list-style-type: none"> – Employ nutrient and waste management BMPs on farms – Address failing septic systems – Upgrade WWTPs to reduce phosphorus 	
Fly Creek	<ul style="list-style-type: none"> – Maintain forested riparian buffers – Restore/protect wetlands 	<ul style="list-style-type: none"> – Employ soil conservation BMPs – Prevent soil erosion on steep slopes – Reduce streambank erosion 	<ul style="list-style-type: none"> – Employ nutrient and waste management BMPs on farms – Address failing septic systems 	<ul style="list-style-type: none"> – Protect wildlife management areas
Cayadutta Creek	<ul style="list-style-type: none"> – Restore forested riparian buffers 	<ul style="list-style-type: none"> – Restrict animal access to streams – Employ soil conservation BMPs 	<ul style="list-style-type: none"> – Upgrade WWTPs to reduce phosphorus – Employ nutrient and waste management BMPs on farms – Protect drinking water supplies – Address brownfield and Superfund sites 	
Canajoharie Creek	<ul style="list-style-type: none"> – Install riparian buffers – Restore wetlands 	<ul style="list-style-type: none"> – Prevent streambank erosion 	<ul style="list-style-type: none"> – Manage animal feeding operations 	<ul style="list-style-type: none"> – Conduct biodiversity assessments
East Canada Creek	<ul style="list-style-type: none"> – Protect forested riparian buffers 		<ul style="list-style-type: none"> – Upgrade WWTPs – Address failing septic systems 	<ul style="list-style-type: none"> – Maintain or improve in-stream habitats

4.2.6.3 Schoharie Watershed Region

The subwatersheds in the Schoharie Watershed Region are summarized in [Table 4-6](#), and a summary of recommendations for this region is presented in [Table 4-7](#).

TABLE 4-6
Subwatersheds of the Schoharie Watershed Region

10-Digit HUC	12-Digit HUC	
Cobleskill Creek	Headwaters West Creek Punch Kill Cobleskill Creek	West Creek Schenevus Creek
Batavia Kill	Huntersfield Creek Bear Kill Manor Kill	Lewis Creek Headwaters Batavia Kill
East Kill	East Kill West Kill Gooseberry Creek	Little West Kill Red Kill
West Kill	West Kill Wharton Hollow Platter Kill	Mine Kill Cole Brook
Panther Creek	Panther Creek Little Schoharie Creek Stony Brook	Keyser Kill Line Creek
Fox Creek	Headwaters Fox Creek Beaver Dam Creek Switz Kill	Ox Kill King Creek

Cobleskill Creek

Relatively high agricultural land use in this subwatershed compromises water quality. Recommendations to restore water quality here are directed toward reducing runoff and the flow of nutrients from agricultural areas into streams. These should include encouraging the protection of wetland areas for flood attenuation, nutrient control and habitat improvement. Critical riparian buffer areas should be restored or protected to control nutrient input, bank erosion and the flow of nutrients. Animal waste and feed should be managed so as to minimize the movement of nutrients into waterbodies. Established programs for AEM, prescribed grazing and soil erosion BMPs should be implemented or expanded.

Parts of this subwatershed, especially the Village of Cobleskill have moderate levels of commercial and suburban development with the concomitant problems of increased impervious surfaces. Recommendations here include the application of the principles of smart growth and the preservation of green space. Communities with municipal separate stormwater systems must implement stormwater management programs that may include some of these elements. Failing septic systems near streams should be repaired or replaced and WWTPs in these areas should apply tertiary treatment to remove phosphorus.

Some segments of Cobleskill Creek appear on the NYDEC’s Section 303(d) list of impaired waterbodies (see Chapter 3), and these issues should be addressed.

Batavia Kill–Schoharie Creek

Much of this subwatershed lies in upland forested areas with relatively low intensity of agriculture and few developed areas. Recommendations, therefore, for much of this subwatershed involve protecting those attributes

that promote good water quality. Nonetheless, the presence of steep slopes, combined with erodible soils has led to turbidity of a number of streams. Schoharie Reservoir, in this subwatershed, appears on the NYDEC’s Section 303(d) list of impaired waterbodies because of silt and sediment. Recommendations here include reducing streambank erosion through natural stream design methods and protecting riparian buffer zones.

West Kill, East Kill, Panther Creek

These subwatersheds have few developed areas and relatively little agriculture. Forest cover is high. Recommendations here are largely for protecting existing attributes that support good water quality. Some streams carry excess sediment loads because of streambank erosion and highly erodible soils. Recommendations include the application of natural stream design methods, protecting forested riparian buffers, and managing stormwater in developed areas.

Fox Creek

This subwatershed has a mix of agricultural and residential land use, and very little commercial land use. Land cover is approximately 60% agricultural and 30% mixed forest. Forest cover increases to the south in the higher terrain of the Catskills. Water quality throughout the subwatershed is good, thus recommendations are mainly for protecting water quality. In agricultural areas, increasing riparian buffers and restoring wetlands are recommended, along with restricting animal access to streams. To reduce erosion along streams, streambanks should be stabilized in areas of highly erodible soils. Also, development along streams should be regulated, which would include requirements such as setbacks, riparian buffers, and floodplain protection. To better understand habitat health, biodiversity assessments are recommended. Failing septic systems are an issue for Warner's Lake.

A summary of the recommended BMPs for each of the HUC-10 subwatersheds in the Schoharie Watershed Region is presented in [Table 4-7](#). These recommendations came from subwatershed assessment reports prepared by Mohawk River Watershed Coalition Soil and Water Conservation Districts, and as such the wording of the BMPs varies slightly from those listed in Table 4-1.

**TABLE 4-7
BMP Recommendations for the Schoharie Watershed Region**

SUBWATERSHED (10-DIGIT HUC)	Recommendations to protect and restore natural hydrology (Strategy Component 1A)	Recommendations to reduce erosion and sedimentation (Strategy Component 1A)	Recommendations to minimize pollution (Strategy Component 1C)	Recommendations to protect and restore habitats (Strategy Component 1D)
Cobleskill Creek	<ul style="list-style-type: none"> – Restore riparian buffers – Restore wetlands – Implement stormwater management practices – Preserve green space 	<ul style="list-style-type: none"> – Restrict animal access to streams – Reduce streambank erosion – Implement soil erosion BMPs 	<ul style="list-style-type: none"> – Address failing septic systems – Employ nutrient and waste management BMPs on farms – Monitor road salt at bridge crossings 	
Panther Creek	<ul style="list-style-type: none"> – Restore riparian buffers 	<ul style="list-style-type: none"> – Stabilize streambanks 		<ul style="list-style-type: none"> – Control invasive plants
Batavia Kill	<ul style="list-style-type: none"> – Increase riparian buffers 	<ul style="list-style-type: none"> – Stabilize streambanks 		
Fox Creek	<ul style="list-style-type: none"> – Restore wetlands – Increase riparian buffers 	<ul style="list-style-type: none"> – Regulate streamside development – Stabilize streambanks – Restrict animal access to streams – Regulate development along streams 	<ul style="list-style-type: none"> – Address failing septic systems (Warner's Lake) 	<ul style="list-style-type: none"> – Conduct biodiversity study along streams
West Kill	<ul style="list-style-type: none"> – Address streamflow below reservoir – Restore/increase riparian buffers 	<ul style="list-style-type: none"> – Seed roadside ditches – Stabilize streambanks 		<ul style="list-style-type: none"> – Conduct biodiversity study of streams – Manage culvert for fish migration
East Kill	<ul style="list-style-type: none"> – Enhance riparian buffers – Install adequate culverts 	<ul style="list-style-type: none"> – Stabilize streambanks – Discourage development near streams 		<ul style="list-style-type: none"> – Control invasive species

4.3 Strategy 2: Advance Municipal Actions

Advance municipal actions to promote sustainability, reduce the impact of flooding and enhance flood resilience, and revitalize communities and waterfronts through the adoption of appropriate zoning and land use policies in the areas of cluster development, control development on steep slopes, floodplain protection, reduce impervious surfaces, protect and restore unique and natural areas, riparian areas, and wetlands.

Municipalities have the regulatory authority under NY state law to adopt local laws governing land use. Many of the tools available to local governments (such as comprehensive planning, zoning, subdivision ordinances, site plan review, etc.) can ultimately affect the potential for water resources protection by reducing the potential for nonpoint source pollution and flooding. Stormwater management and controls on sediment and erosion are key tools available to municipalities. In addition, local land use laws can afford additional protections to critical areas such as wetlands and riparian zones.

As part of the development of the Mohawk River Watershed Management Plan, existing land-use regulations were reviewed for their ability to protect water quality and habitat conditions that challenge the three watershed regions. Seven regulatory tools were identified as holding the potential to help move the watershed communities toward realizing the goals of this Plan. The following subsections describe components of the municipal action strategy, along with recommendations for their adoption. A summary of these recommendations is presented in [Table 4-8](#) (at the end of this subsection). For additional regional summaries, as well as community-specific results, refer to the Mohawk River Watershed Regulatory Review & Analysis (sections 3.1–3.4).⁴

4.3.1 Strategy Component 2A: Increase Density of Cluster Development

The purpose of increased density cluster development is to reduce the impact of new construction on floodplains, streams, wetlands, woodlots, farmland and other environmentally sensitive features. Cluster development regulations typically allow for increased density in areas where that density would result in the preservation and permanent protection of the features described above. As it relates to water quality, clustering can result in a reduction in the broad creation of new impervious surfaces, which can lessen the impact of stormwater runoff on areas outside the development. Additionally, by requiring that naturally vegetated buffers be maintained around lakes, streams and other waterbodies, significant water quality benefits can be obtained.

The lack of cluster development regulations was identified as one of the top five major gaps in all three regions:

- Main River Region – Approximately 52% of municipalities in the Main River Region do not have provisions in their regulatory programs addressing cluster development. Of those that do, only 6% are consistent with best management practices.
- Upper Mohawk Region – Approximately 75% of municipalities in the Upper Mohawk Region do not have any provisions in their regulatory programs addressing cluster development. Of those that do, only 1% are consistent with best management practices.
- Schoharie Watershed Region – Approximately 57% of municipalities in the Schoharie Watershed Region do not have any provisions in their regulatory programs addressing cluster development. Of those that do, only 8% are consistent with best management practices.

⁴ Bergmann Associates. 2014 (January). *Mohawk River Watershed Regulatory Review & Analysis*. Prepared for the Mohawk River Watershed Coalition of Conservation Districts. Link to [Executive Summary](#) or [Full Report](#).

Recommendations to Increase Density of Cluster Development

Where local gaps exist, municipalities should incorporate one or more of the following in their land use control or incentive-based program:

Establish ordinances for higher density cluster development and PUDs. Higher density cluster development and Planned Unit Development (PUD) ordinances should be developed to specifically support environmental objectives such as natural area preservation and stormwater absorption. This should incorporate design standards such as impervious surface limits, riparian buffer zones, green infrastructure requirements, woodlot protection, steep slope regulations, and other BMPs identified elsewhere in this document.

Require buffers around water features in developments. Open spaces associated with higher density cluster development should be placed in lake or streamside areas of the property to buffer the developed areas of the property from these natural water features.

Offer incentives to developments that preserve open space. Provide density bonuses to developments that preserve open space or agriculture. Density bonuses permit higher development density on one portion of a property if the remaining land is preserved for open space or agriculture.

Allow cluster development by right. Municipalities can permit cluster development under current zoning, assuming that the ordinance provides specific guidelines for reducing environmental impacts and that all specific provisions of the cluster development provision are met.

Encourage higher density cluster developments at the hamlet-, village- and/or city-scale rather than as single use subdivisions. This approach not only takes pressure off undeveloped land but would also shape development into mixed-use walkable communities. The resulting mixed-use communities would have the additional environmental benefit of reducing the number of vehicle trips required by local residents. This is a particularly important smart growth practice for minimizing sprawl.

4.3.2 Strategy Component 2B: Control Development on Steep Slopes

Generally speaking, steep slopes tend to be more erosive than flatter slopes. As such, communities often regulate development in these areas so as to prevent erosion and reduce the risk of landslides that endanger lives, damage property and infrastructure, degrade wildlife habitat, and impact water quality by increasing sedimentation.

The lack of regulations addressing development on steep slopes was identified as one of the top five major gaps in two of the three regions:

- Main River Region – Approximately 64% of municipalities in the Main River Region do not have any provisions in their regulatory programs addressing development on steep slopes. Of those that do, only 15% are consistent with best management practices.
- Upper Mohawk Region – Only 25% of municipalities in the Upper Mohawk Region have provisions in their regulatory programs addressing development on steep slopes, of which, only 4% are consistent with best management practices.

Recommendations to Control Development on Steep Slopes

Where local gaps exist, municipalities should incorporate the following recommendations in their regulatory program (see Section 3 of the *Mohawk River Watershed Regulatory Review & Analysis* for community-specific recommendations):

Adopt an ordinance regulating development on steep slopes. This ordinance should require the use of measures designed to prevent/reduce runoff and erosion on all development sites with slopes greater than a predetermined threshold, or require the development of an Erosion, Sediment and Stormwater Control Plan. Alternatively, this ordinance could prohibit development on slopes exceeding a predefined threshold. Typical steep slope thresholds range from 8 to 15%.

Designate a steep slope overlay zone. All development within that zone would be required to implement measures designed to prevent/reduce runoff and erosion. This steep slope ordinance could be included as part of a stormwater, sedimentation, and erosion control ordinance, or it could be created as a stand-alone ordinance.

4.3.3 Strategy Component 2C: Provide Floodplain Protection

Floodplains provide a number of societal benefits related to water quality and watershed management and can be far more effective than many man-made structures (e.g., floodwalls, stream channelization) in reducing downstream flood peaks. By providing flood and erosion control by storing and slowly releasing floodwaters, floodplains can help reduce the depth and velocity of flooding. Naturally vegetated floodplains also trap sediments and pollutants and prevent them from being carried downstream.

While the vast majority of watershed municipalities participate in the National Flood Insurance Program and have enacted the necessary ordinances to do so, many of these are not consistent with accepted best management practices. Floodplain regulatory gaps were identified as one of the top five major gaps in all three regions:

- Main River Region – More than two-thirds of municipalities in the Main River Region have provisions in their regulatory programs addressing floodplain protection, but only 6% are consistent with best management practices.
- Upper Mohawk Region – Approximately 48% of municipalities in the Upper Mohawk Region do not have any provisions in their regulatory programs addressing floodplain protection. Of those that do, only 3% are consistent with best management practices.
- Schoharie Watershed Region – Although 86% of municipalities in the Schoharie Watershed Region have provisions in their regulatory programs addressing floodplain protection, only 8% are consistent with best management practices.

Recommendations to Provide Floodplain Protection

Where local gaps exist, municipalities should incorporate the applicable recommendations in their land use control program:

Adopt the most recent NYSDEC Model Local Law for Flood Damage Reduction. The most up-to-date model laws are available from the NYSDEC's Floodplain Management Section.

Prohibit new impervious surfaces in undeveloped floodplains. Avoiding the creation of new impervious surfaces can lessen the impact of stormwater runoff.

Prohibit on-site septic systems in floodplains. Such systems can leach wastewater into waterways if flooding occurs.

Incorporate the No Adverse Impacts (NAI) Floodplains Strategy into the existing regulatory structure. This strategy requires that proposed developments take into consideration their impacts on increased flood stages, flood velocity, flood flows or the increased potential for sediment and erosion within the watershed. The goal is to ensure that actions in one community do not adversely affect the flood risks for other communities unless the proper mitigation is identified.

4.3.4 Strategy Component 2D: Minimize Impervious Surfaces

Impervious surfaces are those surfaces through which the infiltration of rainwater and snowmelt is slowed or impeded (e.g., parking lots, roads, sidewalks, patios). By removing natural land cover (e.g., grasses, forests) and replacing it with impervious surfaces, the soil's ability to absorb nutrients and trap particulate material is decreased, resulting in increased amounts of pollutants washing into surface waterbodies. In addition to increased pollutant transport, the hydrologic effects of increased runoff from areas with impervious surfaces can affect downstream conditions, including contributing to localized flooding and transfer of pollutants.

The lack of impervious surface regulations was identified as one of the top five major gaps in all three regions.

- Main River Region – Approximately 67% of municipalities in the Main River Region do not have any provisions in their regulatory programs addressing impervious surfaces. Of the 33% that do, only 9% are consistent with best management practices.
- Upper Mohawk Region – Only 9% of municipalities in the Upper Mohawk Region have provisions in their regulatory programs addressing impervious surfaces, most of which are consistent with best management practices.
- Schoharie Watershed Region – Approximately 70% of municipalities in the Schoharie Watershed Region do not have any provisions in their regulatory programs addressing impervious surfaces. Of those that do, only 8% are consistent with best management practices.

Recommendations to Minimize Impervious Surfaces

Where local gaps exist, municipalities should consider incorporating the following recommendations in their regulatory program:

Define Total Impervious Surface Area to include all impervious surfaces on land plots. Include a definition for *Total Impervious Surface Area* that encompasses all impervious surfaces located on a particular plot of land, including, but not limited to structures (primary, accessory, and/or storage), sidewalks, driveways, and patios.

Incorporate standards for Total Impervious Surface Area in municipal zoning ordinances. For rural communities, impervious surfaces should be limited to 10–15% or 2,500 square feet of any lot, whichever is greater, unless a system of stormwater management and artificial recharge of precipitation is developed. For higher density locations (e.g., village cores, urban centers, etc.), impervious surface limits should range from 60–80%. Note that these are just guidelines and that specific thresholds will vary by location and place type (e.g., urban, rural, suburban).

Prohibit or limit new impervious surfaces in riparian zones and floodplain areas. Avoiding the creation of new impervious surfaces can lessen the impact of stormwater runoff and reduce nonpoint source pollution.

Encourage development and redevelopment of existing hamlets/villages/cities. By encouraging the development and redevelopment of existing hamlets, villages and cities, municipalities can limit the amount of new impervious surface added to watersheds.

Encourage compact, higher-density, mixed-use development in areas of high development pressure. This type of development uses less impervious surface per person than low density sprawl.

Incorporate green infrastructure requirements into local land use codes. Examples of green infrastructure include stream buffers, greenbelts, and vegetative zones between impervious surfaces and storm sewers.

4.3.5 Strategy Component 2E: Protect Unique and Natural Areas

Abundant and scenic open spaces are a defining characteristic of the Mohawk River watershed. In addition to providing opportunities for both active and passive recreation, these natural areas can also help to combat pollution and improve water quality by minimizing erosion and reducing runoff to local streams and waterbodies. Protection of these areas can also reduce habitat fragmentation by connecting existing natural areas into a single network.

The lack of regulations addressing the protection of unique and other natural areas was identified as one of the top five major gaps in all three regions:

- Main River Region – Approximately 48% of municipalities in the Main River Region do not have any provisions in their regulatory programs addressing the protection of unique and other natural areas. Of those that do, only 6% are consistent with best management practices.
- Upper Mohawk Region – Approximately 41% of municipalities in the Upper Mohawk Region have provisions in their regulatory programs addressing the protection of unique and other natural areas, of which, only 1% are consistent with best management practices.
- Schoharie Watershed Region – Although 76% of municipalities in the Schoharie Watershed Region have provisions in their regulatory programs addressing the protection of unique and other natural areas, only 8% are consistent with best management practices.

Recommendations to Protect Unique and Natural Areas

Where local gaps exist, municipalities should consider incorporating one or more of the following in their land use control and incentive-based programs to address the protection of unique and other natural areas:

Designate specific areas as Critical Environmental Areas (CEAs). To be designated as a CEA within a given municipality, an area must have an exceptional or unique character with respect to one or more of the following: (1) a benefit or threat to human health; (2) a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality); (3) agricultural, social, cultural, historic, archaeological, recreational, or educational values; or (4) an inherent ecological, geological or hydrological sensitivity to change that may be adversely affected by any change.

Designate areas as nature preserves or afford protections similar to CEAs. Specific areas within a given municipality can be designated as nature preserves, or afforded protections similar to those provided to CEAs.

Require tree survey and integrated site plan for new development. As part of Site Plan Review, require that all new development (and substantial improvements) provide a tree survey and an integrated site plan which includes

a woodlot protection plan, a landscape plan and any additional development on the site, including all new or expanded structures, utilities, access roads, grading or other activities, which may adversely affect woodlots. To reduce the burden on landowners, tree surveys, woodlot plans and landscape plans can be limited to only those areas that will actually be disturbed.

4.3.6 Strategy Component 2F: Protect Riparian Areas

Preventing pollutants from entering waterbodies is considerably more cost-effective than attempting to remediate polluted water. One of the most effective (and least expensive) best management practices to reduce the amount of pollutants entering waterbodies is the use of naturally vegetated riparian buffers. Riparian buffers absorb eroding soils and other pollutants during land grading activities, capture and filter pollutants from post-development stormwater runoff and help to trap fertilizers, pesticides and siltation from croplands, and animal waste from pastures, barnyards and intensive livestock operations. While buffers extending 300 feet beyond the shoreline are recommended as the most effective means to protect waterways, 100-foot buffers are a typical compromise that balances the rights of landowners with the need to improve and preserve water quality.

Generally, municipalities in the Main River and the Upper Mohawk Regions are addressing lake and stream protection at a level somewhat consistent with best management practices, although some gaps do exist. The lack of regulations addressing the protection of lakes, streams and other waterbodies was identified as one of the top five major gaps in only one of the three regions:

- Schoharie Watershed Region – Approximately 54% of municipalities in the Schoharie Watershed Region do not have any provisions in their regulatory programs addressing lake and stream protection.

Recommendations to Protect Riparian Areas

Where local gaps exist, municipalities should incorporate the following recommendations in their land use control or incentive-based program:

Incorporate Shorelines in the definitions section of a municipal zoning ordinance. This definition should include the shorelines of lakes, streams, creeks, ponds, wetlands, and other waterbodies.

Adopt a stream/shoreline buffer ordinance for new development and significant redevelopment in watershed municipalities. This ordinance should prohibit the placement of impervious surfaces within the buffer zone and require that the buffer be naturally vegetated.

Develop guidelines for a naturally vegetated (preserved or planted) water quality buffer adjacent to all shorelines. Provisions should be included that require the planting of a buffer when improvements to an existing lakefront or shoreline property or structure are proposed, and where such a buffer does not exist. Buffers, in this context, are not necessarily forested. These guidelines should also address the differences between vegetated buffers in steeply sloped areas and those areas characterized by relatively flat terrain.

Require exclusionary livestock fencing around streams and stream banks to reduce access by livestock. Variances can be granted for specific stream crossing locations determined necessary for livestock movements on a given property.

4.3.7 Strategy Component 2G: Protect Wetlands

Like floodplains, wetlands provide a number of ecosystem services that contribute to water quality, such as filtering out pollutant- and sediment-laden run-off prior to it entering streams, providing valuable flood protection, acting as storage basins and reducing the amount of downstream flow. To ensure that these services continue, state and federal legislation has been developed to protect these natural features. However, gaps in these laws leaves isolated wetlands smaller than 12.4 acres unprotected in New York State. As such, the only way to extend protection to all wetlands is through the use of local municipal ordinances.

The lack of regulations addressing wetland protection was identified as one of the top five major gaps in only one of the three regions:

- Schoharie Watershed Region – Approximately 30% of municipalities in the Schoharie Watershed Region do not have any provisions in their regulatory programs addressing lake and stream protection.

Recommendations to Protect Wetlands

Where gaps exist, municipalities should incorporate the following recommendations in their regulatory program:

Incorporate Shorelines in the definitions section of a municipal zoning ordinance. This definition should include the shorelines of lakes, streams, creeks, ponds, wetlands, and other waterbodies.

Require Wetland Determination from USACOE for new developments and substantial improvements. As part of Site Plan Review, municipalities can require that all new development (and substantial improvements) provide a Wetland Determination from the U.S. Army Corps of Engineers. A Wetland Determination is a baseline assessment conducted to determine whether wetlands are present, as well as their jurisdictional status.

Adopt a wetland protection ordinance protecting wetlands that fall within the federal/state regulatory gap. This ordinance could exempt certain non-permanent agricultural operations (for example, tilling).

A summary of the recommended municipal action practices for the seven components discussed above is presented in [Table 4-8](#).

TABLE 4-8
Recommendations to Support Municipal Action Strategy and Components

Municipal Action Components and Recommendations		
Increase Density of Cluster Development	Strategy Component 2A	Goals 1, 4, 5
Establish ordinances for higher density cluster development and PUDs		
Require buffers around water features in cluster developments		
Offer incentives to preserve open space		
Allow cluster development by right		
Encourage cluster development at hamlet/village/city scale		
Control Development on Steep Slopes	Strategy Component 2B	Goals 1, 5
Adopt ordinance regulating development on steep slopes		
Designate a steep slope overlay zone		
Provide Floodplain Protection	Strategy Component 2C	Goals 1, 2, 5
Adopt the most recent NYSDEC Model Local Law for Flood Damage Reduction		
Prohibit the creation of new impervious surfaces in undeveloped floodplains		
Prohibit on-site septic systems in floodplains		
Incorporate NAI Floodplains Strategy into existing regulatory structure		
Minimize Impervious Surfaces	Strategy Component 2D	Goals 1, 3, 5
Define <i>Total Impervious Surface Area</i> to include all impervious surfaces on plots		
Incorporate <i>Total Impervious Surface Area</i> standards in zoning ordinances		
Prohibit or limit new impervious surfaces in riparian zones and floodplain areas		
Encourage development/redevelopment of existing hamlets, villages, cities		
Encourage compact, higher-density, mixed-use in areas of high development pressure		
Incorporate green infrastructure requirements into local land use codes		
Protect Unique and Natural Areas	Strategy Component 2E	Goals 1, 4
Designate specific areas within a given municipality as CEAs		
Designate areas as nature preserves or afford protections similar to CEAs		
Require tree survey and integrated site plan for new development		
Protect Riparian Areas	Strategy Component 2F	Goals 1, 2, 3
Incorporate Shorelines in the definitions section of a municipal zoning ordinance		
Adopt stream/shoreline buffer ordinance for new development/significant redevelopment		
Develop guidelines for naturally vegetated buffer adjacent to all shorelines		
Require exclusionary livestock fencing around streams and stream banks to reduce access by livestock		
Protect Wetlands	Strategy Component 2G	Goals 1, 3, 4
Incorporate Shorelines in the definitions section of a municipal zoning ordinance		
Require Wetland Determination for new developments / substantial improvements		
Adopt ordinance protecting wetlands that fall within the federal/state regulatory gap		

4.4 Strategy 3: Advance Collaboration and Partnerships

Advance collaboration and partnerships to promote sustainable communities, smart growth, economic development, and environmental quality through advancing collaboration and partnerships with the NYSDOS Local Waterfront Revitalization Program (LWRP), Mighty Waters Working Group, NYSDEC Mohawk River Basin Action Agenda, New York Rising Community Reconstruction (NYRCR) Program, and the Cleaner, Greener Communities Program.

The development of this Mohawk River Watershed Management Plan is itself an example of effective collaboration and partnerships. As noted in Chapter 1, the 14 county SWCDs within the Mohawk River Watershed formed the Mohawk River Watershed Coalition of Conservation Districts in 2009. Montgomery County applied for and was awarded a 2009 grant from the NYS Department of State's Title 11 Environmental Protection Fund (EPF) Local Waterfront Revitalization Program (LWRP) to prepare a watershed plan in partnership with the 14 SWCDs. The Plan was developed in collaboration with the Mohawk River Watershed Advisory Committee, which includes representatives from the NYSDOS, NYSDEC, USGS, the State University of New York, Union College, the U.S. National Park Service, The Nature Conservancy, NYS Canal Corporation, Cornell Cooperative Extension, Cornell Water Resources Institute, NYS Dept. of Agriculture and Markets, Tug Hill Commission, Capital District Regional Planning Commission, Herkimer-Oneida Counties Comprehensive Planning Program, USDA NRCS, USACOE, NYSDOT, Empire State Development, USFWS, all 14 SWCDs in the watershed, and watershed municipalities.

The active participation of these agencies and organizations reflects the importance of the Mohawk River Watershed and the severity of the flood-related damages incurred in recent years. There are five major program initiatives underway in the watershed; the goals of these related programs are described in the subsections that follow. Many specific projects recommended by these programs are included in Chapter 5. The key programs include

- NYSDOS Local Waterfront Revitalization Program
- Mighty Waters Working Group
- NYSDEC Mohawk River Basin Action Agenda
- New York Rising Community Reconstruction Program
- Cleaner, Greener Communities Program

In addition, the U.S. Army Corps of Engineers (USACOE) plans to complete a detailed hydrologic evaluation of the basin once federal funding is approved. Following the floods of 2006, Congress requested a reconnaissance study of the Mohawk River, which was completed in 2008. The next step is to complete a feasibility study, followed by specific recommendations to enhance flood resiliency in the watershed. As of the end of 2014, the feasibility study had not yet been funded by Congress. Once the study is funded, the USACOE will coordinate with this Plan and adjust the scope of work to carry forward the tasks that the Mohawk River Watershed Coalition prioritizes. Per agreement with the USACOE in 2011, the cost of the Mohawk River Watershed Management Plan will serve as the local match for the federal investment in the planned feasibility study and action plan.

All the cited programs and initiatives encompass water resource management issues related to water quantity (flooding) and/or quality. The vision and goals of the Mohawk River Watershed Management Plan are clearly focused on all aspects of water resources in the watershed, including water quality, hydrologic processes, flood hazard risk reduction, fish and wildlife habitat, waterfront communities, and working landscapes such as agriculture. As the Watershed Management Plan is implemented, it will be important to continue the effective collaboration and working partnerships among agencies fostered by its development.

4.4.1 Strategy Component 3A: Local Waterfront Revitalization Program

The objective of the Local Waterfront Revitalization Program (LWRP) is to assist local governments and community organizations in planning and implementation of sustainable initiatives for community revitalization. This program has accomplished a great deal to advance community and waterfront revitalization, including Main Street and downtown revitalization efforts, in communities adjacent to the Mohawk River. The vision for the Mohawk River Watershed (section 1.1.1) states, in part, that “vibrant watershed communities find prosperity in the strong economy where water-based recreation and tourism thrive along the waterfront.”

City of Amsterdam Local Waterfront Revitalization Program. This program was approved in 1993, and with EPF LWRP funding led to design, planning and construction of streetscapes, waterfront parks, and trail facilities on both sides of the river. The “Proposed Land and Water Uses and Proposed Projects” section of the City’s Local Waterfront Revitalization Program states that “primary water use shall be recreational boating” and that “a key component of the City’s waterfront revitalization strategy is to take advantage of the recreational tourism potential of the Erie Canal.” The proposed water projects all aim to fulfill this goal – the Downtown Waterfront Park which now exists as the Riverlink Park. The ongoing redevelopment of Chalmers Mill is the southern terminus of the multi-million dollar Overlook Bridge, which is also under construction, as is the West End Boat Launch located near Lock 11.

City of Little Falls Local Waterfront Revitalization Program. Approved in 2010, many of the proposed projects are land based, but several are canal or waterside, boating, recreational and access oriented such as Canal Harbor Development and Enhancements, and trail development on both sides of the river. Little Falls Canal Harbor is one of eight designated Harbor Centers on the NYS Canal System.

Western Montgomery draft Local Waterfront Revitalization Program. Completed in 2005, this draft program includes the towns of Minden, St. Johnsville, and the villages of Fort Plain, St. Johnsville. Trail, boating and recreational projects are included, as well as Otsquago Creek Stabilization, which is also a priority for the Montgomery County NY Rising Community Reconstruction Plan. Planning for the Old Military Road Trail in Fort Plain is complete. A grant for implementation is in place but on hold while the village concentrates on storm recovery. Significant upgrades to the St. Johnsville Marina have also been completed with EFP LWRP funding.

Central Mohawk draft Local Waterfront Revitalization Program. With a draft completed in 2000, this program includes the town of German Flatts and the villages of Frankfort, Ilion, Middleville and Mohawk. Relevant proposed projects include trail, park and marina development; stormwater sewer upgrades; stream bank stabilization. A 2014 award will address improve community resiliency, enhance water quality, and promote tourism and recreation (preparing designs for floodplain restoration and public recreation amenities) in the town of German Flatts and village of Mohawk.

Mid-Montgomery County draft Local Waterfront Revitalization Program. With a draft completed in 2009, this program includes the towns of Glen and Mohawk, and the villages of Fonda and Fultonville. There are several relevant “Water and Land Use Goals and Projects” focusing on enhanced access to the waters. Proposed projects include development of a waterfront park and marina and enhancement of regional trails. Design of a new public waterfront park at the Fonda Canal Maintenance Facility is nearing completion, while the dock and overlook in Fultonville is finished and in use.

4.4.2 Strategy Component 3B: Mighty Waters Working Group

In 2010, U.S. Congressman Paul Tonko, who represents New York's 20th district (then the 21st district), hosted the first Mighty Waters Conference. The conference focused on promoting sustainable and responsible waterfront development projects as a means to improve the quality of life in communities along the Hudson and Mohawk Rivers and Erie Canal. As a result, the Mighty Waters Task Force was created. The mission of the Task Force is to identify and implement effective legislative and administrative means that will (1) ensure that federal agencies and resources are used more effectively to benefit the region, (2) attract additional federal resources where necessary, and (3) galvanize local and regional interest in waterway-related projects and policies.

In 2012, Governor Andrew Cuomo directed NYSDEC and NYSDOS to create a cabinet-level Mighty Waters Working Group to promote economic revitalization and environmental sustainability in the Mohawk Valley area. The working group will further the goals of Congressman Tonko's Mighty Waters Initiative and support the work of the Mohawk Valley and Capital Region Economic Development Councils and a number of State agencies. The working group will partner and collaborate with businesses, local governments, academic institutions, federal agencies, civic leaders, and non-governmental organizations. The working group will also position the region to receive and strategically deploy federal resources that may become available.

Coordination of working group efforts toward economic development and community revitalization will be undertaken by NYSDOS, which has worked extensively with localities in the Mohawk Valley to enhance community development through its Local Waterfront Revitalization Program. This effort builds upon, and will work within, the Governor's Regional Economic Development Councils for the Capital Region and Mohawk Valley.

NYSDEC will coordinate the working group partnership's efforts to improve environmental sustainability and flood hazard risk reduction, bringing elements of an award-winning watershed collaboration for the Hudson River Watershed to the Mohawk River valley. The resulting Action Agenda for the Mohawk is described below in section 4.4.3.

The working group will also coordinate with the Cleaner Greener Communities Program administered by NYSERDA. That program (described below in section 4.4.5) will fund the development of comprehensive sustainability plans in the Mohawk Valley and Capital Region. Additional State agencies participating in the working group include Department of Agriculture and Markets, Empire State Development Corporation, New York State Canal Corporation, State Office of Emergency Management, and the New York State Office of Parks, Recreation, and Historic Preservation.

The following Mighty Waters municipal projects, mostly related to waterfront revitalization, are listed under the appropriate Mohawk River Watershed Management Plan goal.

Goal 3: Promote flood hazard risk reduction and enhanced flood resilience.

Resilience Design Planning (Cohoes (Ci))

Goal 5: Revitalize communities and waterfronts and adopt smart growth land use practices.

Blueway Loop Trail (Cohoes (Ci))

Waterfront Upland Development (Cohoes (Ci))

Fort Herkimer Canoe and Kayak Park (German Flatts (T))

Pedestrian Connections and Waterfront Access II: Benton's Landing (Little Falls (Ci))

Benton's Landing and Downtown Boater Access (Little Falls (Ci))

Waterfront Parks (Little Falls (Ci))

Mohawk Valley Gateway Overlook	(Amsterdam (Ci)) – construction underway
River Walk	(Amsterdam (Ci)) – planning underway
Canalway Trail I: Eastern Montgomery	(Montgomery County)
Canalway Trail II: Countywide	(Montgomery County)
Blueway Trail Launches	(Montgomery County)
Bellamy Harbor Park	(Rome (Ci)) – construction imminent
NYS Canalway Trail	(Rome (Ci))
Rod Mill Reuse Strategy	(Rome (Ci)) – construction underway
Utica Harbor Redevelopment	(Utica (Ci)) – planning underway
Mohawk Towpath	(Clifton Park (T))
Mohawk Hudson Bike Trail Rotterdam Extension I: Underpass	(Rotterdam (Ci))
Mohawk Hudson Bike Trail Rotterdam Extension II: Construction	(Rotterdam (Ci))
ALCO Riverfront Revitalization Project	(Schenectady (Ci)) – planning underway
Eastern Gateway Enhancement Project	(Scotia (V))
Scotia/Glenville Canalway Trail	(Scotia (V))

There are several water-related projects that Mighty Waters communities hope to implement. These include:

- Montgomery County: Villages of Canajoharie and Palatine Bridge—Consolidation/expansion of sanitary sewer service
- Oneida County: City of Utica—Utica Harbor Redevelopment (Harbor Point Recreational Area / Utica Marsh Natural Area)
- Herkimer/Oneida Counties: Preparation of intermunicipal Local Waterfront Revitalization Plans.

4.4.3 Strategy Component 3C: Mohawk River Basin Action Agenda

The NYSDEC and its partners developed the Mohawk River Action Agenda as a means to promote coordinated management of the environmental and cultural resources of the Mohawk River and its watershed. The five areas addressed by the Action Agenda are congruent with the vision and goals of the Watershed Advisory Committee that developed this Watershed Management Plan; the areas include elements of both the natural and the built environment, with a focus on sustainable communities. The five elements are fish, wildlife, and habitats; water quality; flood hazard risk reduction; community revitalization; and working landscapes. The NYSDEC has established a Mohawk River Basin Program, modeled on the successful Hudson River Estuary Program, to coordinate the many projects and initiatives underway.

Recently, the Mohawk River Basin Program published a paper entitled “[Mohawk River Basin Initiative 2014-2016](#),” which focuses on the need for additional basin information. Early in 2014, a workshop was held to “identify specific research needs and address filling data gaps in the Mohawk River Basin. The overall purpose of the workshop was to compile the opinions of these diverse experts into a ‘Research Initiative’ document.” Three of the five Action Agenda areas were addressed: Fish, Wildlife, and Habitats; Water Quality; and Flooding.

4.4.4 Strategy Component 3D: New York Rising Community Reconstruction Program

The New York Rising Community Reconstruction (NYRCR) Program was established to provide additional rebuilding and revitalization assistance to communities severely damaged by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. To facilitate community redevelopment planning and the resilience of communities, the state established the NYRCR Program and allocated \$25 million to planning for the most affected communities.

The completion of a NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Plan was locally driven by a Planning Committee that assessed storm damages and current risk, identified community needs and opportunities, and developed recovery and resiliency strategies. Each plan identifies projects and implementation actions to help fulfill those strategies.

Each NYRCR planning area is eligible for between \$3 million and \$25 million of Community Development Block Grant (CDBG) dollars to implement elements of their plans. The NYRCR Team is also working to help communities identify other federal, state, local, nonprofit, and private resources to supplement this funding. Some projects and actions identified in the plans are longer-term, and need to be further developed before their implementation may begin.

Four community reconstruction plans and three countywide resiliency plans were developed for affected areas of the Mohawk River watershed. The plans may be viewed at the [New York Rising website](#).

- City and town of Amsterdam and town of Florida NYRCR Plan
- City of Schenectady and town of Rotterdam NYRCR Plan
- Towns and villages of Esperance, Schoharie, and Middleburgh NYRCR Plan
- Village of Waterford NYRCR Plan

- Herkimer County Communities: Herkimer County NY Rising Countywide Resiliency Plan
- Montgomery County Communities: Montgomery County NY Rising Countywide Resiliency Plan
- Oneida County Communities: Oneida County NY Rising Countywide Resiliency Plan

The NY Rising countywide resiliency plans for Oneida, Herkimer, and Montgomery Counties include projects recommended based on flood mitigation studies conducted by the engineering firm Milone and MacBroom, Inc., of Cheshire, CT. The 13 studies focused on specific streams or reaches of streams that flooded during recent storm events, and caused property damage to towns and villages. An example is the flooding of Fulmer Creek in Herkimer County that caused damage to structures within the town of German Flatts and the village of Mohawk. The Fulmer Creek study recommendations included several specific actions and resulted in an EPF LWRP award in 2014.

The Milone and MacBroom studies were used to help develop recommended projects in the countywide resiliency plans for Oneida, Herkimer, and Montgomery Counties in sections on natural and cultural resources, and in support of the following strategies:

- Utilize a combination of streambank restoration/alignment and upgrading of infrastructure at stream crossings to reduce erosion and mitigate flooding and losses (Oneida and Herkimer Counties).
- Preserve and restore natural areas including floodplains, streams, and wetlands to help mitigate flooding via watershed and stream restoration projects.

Some of the projects are listed in Chapter 5: Implementation, Tracking, and Monitoring, and can be found in the regional tables of recommended projects, Table 5-3, Upper Mohawk, and Table 5-5, Main River. For the Fulmer Creek example, the project is listed as “Fulmer Creek Bank Stabilization.” Full lists of projects in the countywide resiliency plans can be viewed at the [New York Rising website](#).

4.4.5 Strategy Component 3E: Cleaner, Greener Communities Program

The Cleaner, Greener Communities Program was announced by Governor Cuomo in his 2011 State of the State address as a \$100 million competitive grant program to encourage communities to develop regional sustainable

growth strategies. The Regional Sustainability Planning Program is the first stage of the Cleaner, Greener Communities program and is intended to provide the necessary resources for each region in New York State, as defined by the boundaries of the Regional Economic Development Councils, to develop a comprehensive sustainability plan. The plans that result from this program will

- Establish a statewide sustainability planning framework that will aid in statewide infrastructure decision making.
- Outline specific and tangible actions to reduce greenhouse gas emissions consistent with a goal of 80% carbon reductions by the year 2050.
- Inform municipal land use policies.
- Serve as a basis for local government infrastructure decision making.
- Help guide infrastructure investment of both public and private resources.
- Provide every region with a sustainability plan that will enable them to strategically identify and prioritize the projects they submit for consideration to the Implementation Grant stage.

The [Mohawk Valley Regional Sustainability Plan](#), completed in 2013, includes elements focused on transportation, land use, energy, water management, waste management, economic development, and agriculture and forestry. For water management, the goal of the plan is to "Maintain Water Quality."

4.4.6 USEPA's Nine Minimum Elements of a Watershed Management Plan

The U.S. Environmental Protection Agency has developed a framework for watershed management plans that are developed and implemented for threatened or impaired waters using funding from [Clean Water Act section 319](#). As noted in Chapter 2: Watershed Characterization, about one-third (2,340 miles) of the more than 6,600 river miles in the Mohawk River Basin are included on the 2010 Priority Waterbodies List (PWL) as either not supporting uses or having minor impacts or threats to water quality. Most (79%) of these PWL-designated river miles are considered Stressed or Threatened; these waters fully support designated uses but exhibit declining water quality and/or aquatic habitat conditions. Only about 7% of all stream segments within the watershed are designated as Impaired, signifying that the waters do not fully support their designated uses. Twenty-seven (27) of the 136 separate lake segments in the Mohawk River Watershed are included on the PWL as having either impaired uses or minor impacts/threats to uses. These impaired/impacted lakes represent nearly one-half (47%) of the total lake acres in the basin. Impairments to two of the four largest lakes in the basin (Delta Reservoir and Schoharie Reservoir) account for over 3,500 impaired acres, or 58% of the total impaired lake acres in the basin where fish consumption, recreational uses and/or aquatic life are not fully supported.

The USEPA nine minimum elements to be included in a section-319-funded watershed management plan for threatened or impaired waters are as follows:

1. Identify the causes and sources of pollution
2. Estimate pollutant loading into the watershed and the expected load reductions to be realized with implementation of the recommendations
3. Describe management measures that will achieve load reductions and target critical areas
4. Estimate the amounts of technical and financial assistance and the relevant authorities needed to implement the plan
5. Develop an information/education component
6. Develop a project schedule

7. Describe the interim, measurable milestones
8. Identify indicators to measure progress
9. Develop a monitoring component

The nine elements are addressed in the NYSDOS guidebook *Watershed Plans: Protecting and Restoring Water Quality*, which was used as a framework for developing the Mohawk River Watershed Management Plan. However, due of the size of the watershed, it was not feasible, within the project budget, to estimate the loading reductions to be achieved by implementing specific recommended actions for threatened or impaired waterways (element 2). This important analysis will therefore be carried over as a recommended action for the specific segments to be targeted for remedial measures, as set forth in Chapter 5.