TIDAL RONDOUT CREEK WATERSHED MANAGEMENT PLAN
EXECUTIVE SUMMARY

FINAL DRAFT FOR PUBLIC COMMENT
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EXECUTIVE SUMMARY

The City of Kingston has completed a watershed management plan for the tidal section of Rondout Creek. This is the 3.6-mile section of the creek downstream of the dam at Eddyville, representing 6% of the 63-mile length of the river. Financial resources for this watershed management plan were provided through the New York State Department of State with funds provided under Title 11 of the Environmental Protection Fund.

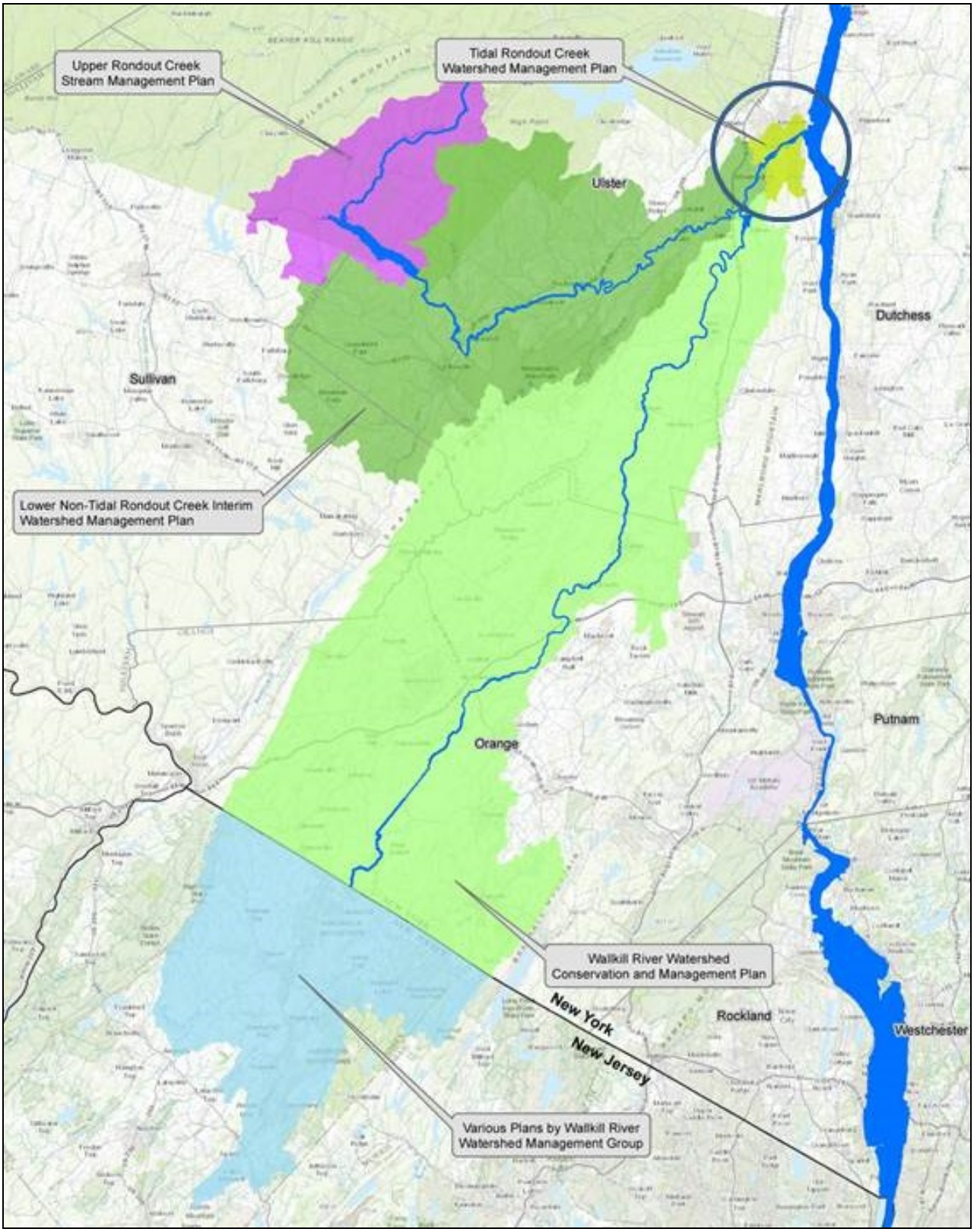
Rondout Creek is one of the largest tributary watersheds to the Hudson River, with an area of approximately 1,199 square miles. The watershed includes the entire Wallkill River subwatershed as well as Rondout Reservoir, which is part of the New York City water supply network. The headwaters of Rondout Creek begin in the Town of Shandaken in the eastern Catskills. The river flows south into Rondout Reservoir then continues east and northeast until it reaches the Hudson River along the City of Kingston waterfront, pictured to the right. The image on the next page illustrates the entire watershed and identifies the planning activities in other portions of the watershed.

The 11-square mile watershed of the *tidal* section of Rondout Creek consists of portions of the City of Kingston, Town of Ulster, and Town of Esopus. Although this watershed management plan addresses only 1% of the entire watershed of Rondout Creek, actions in these three communities may directly affect water quality in the tidal section of the creek. To help evaluate the sometimes subtle differences between issues in different parts of the watershed, the tidal watershed was divided into 17 subwatersheds. Eight of the subwatersheds are located along the north bank of the creek in Kingston and Ulster, and nine are located along the south bank of the creek in Esopus.

In order to educate the general public on the watershed planning effort, gain community support, and learn from the community, a Project Advisory Committee was developed to guide the watershed planning effort. The Committee developed a public participation plan to encourage a meaningful dialog.

The Tidal Rondout Watershed Management Plan is organized by the following series of chapters:

- ❑ Chapter 1 identifies the study area, project stakeholders, watershed vision and project goals and objectives.
- ❑ Chapter 2 presents an inventory of existing conditions based upon available data and information, including the assessment of the watershed.
- ❑ Chapter 3 presents the key studies and plans that are most directly relevant to the subject plan.
- ❑ Chapter 4 provides a review of plans, policies, and regulations that affect the watershed.
- ❑ Chapter 5 describes potential management strategies for identified problems.
- ❑ Chapter 6 presents the findings and suggested actions for watershed management objectives.


Upper Rondout Creek
Stream Management Plan
Tidal Rondout Creek
Watershed Management Plan
Ulster
Dutchess
Sullivan
Lower Non-Tidal Rondout Creek Interim
Watershed Management Plan
Putnam
Orange
Wallkill River Watershed
Conservation and Management Plan
New York
New Jersey
Rockland
Westchester
Various Plans by Wallkill River
Watershed Management Group

The vision and goals of the watershed management plan were developed through a thorough public outreach process. The vision statement describes desired accomplishments, sets the tone of the watershed plan, and was used throughout the planning process. The vision statement was structured to translate into a set of goals and objectives.

THE VISION FOR THE TIDAL RONDOUT CREEK WATERSHED IS THAT IT BECOMES A HEALTHY NATURALLY SUSTAINABLE STREAM SYSTEM SURROUNDED BY A VIBRANT WATERFRONT COMMUNITY.

Two goals were identified through the planning process to provide a framework for the suggested watershed management actions:

Goal #1

Restore tributary streams and subwatersheds to improve water quality.

This goal focuses on conditions along tributary streams and subwatersheds within the watershed communities of Kingston, Ulster, and Esopus.

Goal #2

Create a vibrant waterfront by improving water quality.

This goal focuses on the main stem of the tidal Rondout Creek abutting Kingston, Ulster, and Esopus.

Because the tributary streams and subwatersheds are directly connected to the main stem of the Tidal Rondout Creek, the two goals support the vision that the Tidal Rondout Creek Watershed becomes a healthy naturally sustainable stream system surrounded by a vibrant waterfront community. The following objectives were developed for each goal:

Goal #1 – Restore tributary streams and subwatersheds to improve water quality

- ❑ Restore tributary streams and enhance riparian vegetation along tributary streams
- ❑ Reduce streambank and channel erosion along tributary streams
- ❑ Prevent or minimize flood damage along tributary streams
- ❑ Modify stormwater management in tributary subwatersheds
- ❑ Manage land use and redevelopment in tributary subwatersheds
- ❑ Manage disposal of sanitary wastewater in tributary subwatersheds

Goal #2 – Create a vibrant waterfront by improving water quality

- ❑ Manage land use and redevelopment along the Kingston waterfront
- ❑ Mitigate tidal flooding in the Kingston, Esopus, and Ulster waterfront areas
- ❑ Reduce sewer overflows into Rondout Creek
- ❑ Improve water quality classification of Rondout Creek from C to B
- ❑ Increase training, education, and stewardship

One of the key findings of the watershed management planning process is that the tidal section of Rondout Creek is not listed on the Section 303(d) List of Impaired Waters. The City of Kingston's recently-completed water quality study found that water quality parameters in Rondout Creek did not exceed the water quality standards set by NYSDEC. On the other hand, water quality monitoring results provided by Riverkeeper demonstrate that water quality in Rondout Creek stands to benefit from improvements in the watershed. These conclusions are not mutually exclusive, nor do they directly contrast with the lack of Rondout Creek appearing on the list of impaired waters. The bottom line is that there is room for improvement in the water quality found in Rondout Creek. In fact, despite its absence from State impaired water lists, Rondout Creek is a Class C watercourse in its tidal section. A Class C designation indicates that the waters support fisheries and are suitable for non-contact activities, but are not suitable for swimming, contact recreation or as drinking water.

Another key finding of the watershed management planning process is that flooding in the watershed communities has negatively impacted Rondout Creek whether it occurs (1) along tributary streams, (2) where streams are *not* present, or (3) directly from tidally-influenced flooding of the creek. Consideration of floods is essential in the context of watershed planning because floods are a significant cause of water quality impairment. Floodwaters mobilize pollutants from developed land including petroleum products, chemicals, and sanitary wastewater. Floodwaters can disengage tanks, equipment, and vehicles and carry them downstream to sensitive watercourses. Reduction of flood damage is one of the most important aspects of protecting water quality.

Other important findings are related to stormwater runoff, combined sewer overflows, land use and development densities, and the condition of tributary streams. In many parts of the watershed, tributary streams are not visible because they have been relegated to stormwater systems and buried culverts. Ecological functions have been lost and floodplains have been disconnected from these tributaries. All of these factors may contribute to water quality impairment.

In light of the vision, goals, objectives, and findings, the following management strategies were explored in the planning process:

- ❑ Stormwater management
- ❑ Sanitary wastewater management
- ❑ Land use planning and regulations
- ❑ Tributary stream restoration
- ❑ Flood mitigation
- ❑ Wetlands and habitat restoration
- ❑ Monitoring
- ❑ Education and training
- ❑ Consideration of changing conditions

Approximately 60 individual recommended actions were developed during the planning process, with a handful of actions stemming from consideration of each management strategy. Actions are listed in Table 6-1. Table 6-1 also presents suggested timeframes, responsible parties, and funding sources. Appendix G presents identifies the priority subwatersheds for each action, whereas Table 6-1 identifies the *overall* high priority actions determined by the Project Advisory Committee. The following three projects have been identified as high priority projects for implementation:

225 Wilbur Avenue

Eroding stream banks, steep slopes and sharp turns in the Twaalfskill Brook were identified in a section of the brook that runs parallel to Wilbur Avenue near address number 225. Signs of damage from erosion are evident upstream, downstream and at this location. Stream banks and the stream channel can be stabilizing using a number of techniques such as cross vanes in the channel and combinations of rocky and vegetated treatments in the stream banks. These channel and bank treatments must be designed to withstand water velocities and elevated stream power during high discharge events.

> From Objective #1.2, 'Reduce streambank and channel erosion along tributary streams,' the actions identified are (1) Stabilize eroding banks along watercourses in Kingston, Ulster, and Esopus using natural, bioengineered, and hybrid gray/green bank treatments and (2) Address downcutting and channel erosion on a case-by-case basis with cross vanes and other base level control techniques.

Tannery Brook parallel to Linderman Avenue beginning at Twin Ponds Drive

Objective #1.3, 'Prevent or minimize flood damage along tributary streams' was identified as a high priority objective for the neighborhood bordered by Twin Ponds Drive to the southwest and Washington Avenue to the northeast. Beginning near Twin Ponds Drive, Tannery Brook flows roughly parallel to Linderman Avenue and crosses Loughran Court, Navara Street, and Hewitt Place, approximately 200 feet from the start of each side street. Tannery Brook then becomes piped and buried and is no longer

visible. There has been a great deal of nuisance flooding in this neighborhood. Clogged and undersized culverts were observed along this stream segment as well as natural debris and manmade structures which span or are in the tributary and pose a threat during storm events.

Under Objective #1.3, the following action items could greatly improve conditions within this area:

a. Re-connect tributary streams to their floodplains by pursuing all the actions suggested above (daylighting streams, replacing walls with naturalized stream banks, and stabilizing banks) and by removing berms and any other obstructions
b. Enhance existing floodplains and construct floodplain benches to accommodate flood waters and provide space for debris flowing downstream in floods
c. Increase bridge and culvert capacities to allow conveyance of floodwaters while minimizing debris clogs
d. Remove outbuildings, tanks, and stored materials from stream corridors

In the short term, option (c) in the text box to the left may be most easily implemented as it would require a lesser acreage of disturbance and involve fewer property owners. Option (d) may also be relatively easy to implement, whereas options (a) and (b) will require working with property owners and securing easements for floodplain projects.

Green Infrastructure along 9W Bypass

From Objective 1.4, 'Modify stormwater management in tributary subwatershed,' action 'i. to incorporate green infrastructure and improved stormwater management at and along the Route 9W bypass,' has been identified as a high priority action item. This section of 9W is largely void of green infrastructure. The addition of green infrastructure features such as vegetated swales and increased stormwater retention would aid in the management of stormwater from this area. Reducing stormwater runoff would then help reduce nonpoint source pollution and lower the frequency of combined sewer overflows.

Typical Definitions of Green Infrastructure (GI)

EPA: GI uses vegetation, soils, and natural processes to manage water and create healthier urban environments.

American Rivers: GI is an approach to water management that protects, restores, or mimics the natural water cycle…. GI incorporates both the natural environment and engineered systems to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people and wildlife…. On the local level, GI practices include rain gardens, permeable pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting systems.

The Nature Conservancy: GI solutions are planned and managed natural and semi-natural systems which can provide more categories of benefits, when compared to traditional gray infrastructure. GI solutions can enhance or even replace a functionality that is traditionally provided by man-made structures…. GI solutions employ ecosystem services to create more resource efficient systems involving water, air and land use.