

## **SECTION 1 - INTRODUCTION**

### **1.1 Watersheds and Their Importance**

A watershed is an area of land that drains water into a specific pond, stream or river for which it is named. For example the Hudson River watershed encompasses 13,000 square miles, where all the water flows downhill through a network of connected streams, ponds, wetlands and underground waters into the Hudson River. Watersheds have boundaries, called divides, located at relatively high elevations or ridges. Whenever you leave one watershed, you immediately enter another. A healthy watershed performs many functions. It serves to capture, store and recharge groundwater, filter out water pollutants, and safely release precipitation or rainwater as to avoid flood events during severe rainfall. (Coquille Watershed Association, 2010).

These watersheds and the waterways they feed into were the focus of the Clean Water Act of 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States. In attempts to restore impaired waters regulations were implemented to reduce pollution from a variety of industries. Critics of the regulatory approach assert that these strategies offered few economic incentives to comply with mandated watershed protection and required the government to specify which technologies and methods should be used in every situation rather than provide situation-specific alternatives (Rosenbaum, 1998).

In response, since the 1980s, watershed organizations or partnerships as well as federal and state agencies have focused more intently on managing the quality of water resources through an approach that more strongly incorporates community engagement and empowers stakeholders rather than relying solely on government officials (Steelman and Carmin, 2002; Koontz and Korfmacher, 2000; Luxenberg, 2007). The 1987 amendments to the Clean Water Act (CWA) established Section 319: Nonpoint Source Management Program. Under Section 319, states, territories and tribes receive grant money that supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring to assess the success of specific nonpoint source implementation projects (Clean Water Act Section 319, 2010). Watershed organizations and partnerships have become increasingly important as venues for this type of interaction and have been rapidly increasing in number since the 1990's (Low and Randhir, 2005). Water resource experts strongly recommend that towns develop watershed management plans, so that management practices on individual sites can be coordinated as to location, size and function.

A comprehensive approach to watershed management and best land use management practices has been embraced as a leading strategy to address threats to the natural environment and to improve the conditions within a watershed (Wholey, 1999). The Handbook for Developing Watershed Plans published by the EPA in 2008 defines this watershed approach as a "flexible framework for managing water resource quality and quantity within specified drainage areas, or watersheds. This approach includes collaborative stakeholder involvement and comprehensive management actions supported by sound science and technology" (Handbook for Developing Watershed Plans to Restore and Protect Our Waters, 2008). The watershed planning process works within this framework by using a series of cooperative, iterative steps to characterize

existing conditions, identify and prioritize problems, define management objectives, develop protection or remediation strategies, and adapt and implement selected actions as necessary (EPA, 2008).

Researchers suggest that using knowledge from multiple segments of society helps to generate policies, projects and plans that are technically sound and can more accurately address local concerns. They also assert that increased participation in these collaborative processes can increase awareness of issues and/or enhance the skills and knowledge of stakeholders. Increasing skills and knowledge can further contribute to increased adoption of best management practices (Curtis and Lockwood, 2000). Collaborative and comprehensive processes are an important component in the development of any watershed management plan.

## **1.2 History of the Rondout Creek Watershed Council:**

Between 2004-07, a series of heavy rain events occurred in the Hudson River Valley region and caused severe flooding and public water supply contamination in multiple counties. By the end of that three-year period, a total of 20 counties were declared disaster areas. Major damages occurred on the Esopus and Rondout Creeks in Ulster and Greene County. The damage to private property owners and local businesses was worth millions of dollars; many homes were lost and residents forced to evacuate. The Federal Emergency Management Agency stated that an average of 3,400 New Yorkers registered for federal aid, making the disaster recovery assistance \$35 million (Suro and Firda, 2007). With concerns and questions about the condition of watershed management in the Hudson Valley at a high, state and local government and agencies began more actively meeting with local residents and stakeholders to provide watershed education and identify the needs of their communities. These inquiries and meetings lead to the increased consensus-seeking watershed partnerships by the Hudson Valley property owners and residents who were affected by the flooding. Stakeholder partnerships consist of representatives from private interest groups, local public agencies, and state and federal agencies, which convene as a group, periodically and indefinitely, to discuss and or negotiate public policy within a broadly defined issue area (Leach, 2002). They strive to reach agreement and may pursue intermediate goals such as trust building, outreach, education and research.

As a direct result of these events, the Rondout Creek Watershed Council (RCWC), a coalition of multiple stakeholders, was formed in 2007 to promote watershed awareness, planning and protection. Grant funding from the NYS DEC Hudson River Estuary program was administered by the Open Space Institute (OSI) /Hudson Basin River Watch (HBRW) and enabled Hudson River Sloop Clearwater to incubate the RCWC while providing administrative support. Since the formation of the RCWC, information and education has increased significantly throughout the watershed through the development of outreach materials and events. These include: a detailed delineation of the lower, non-tidal or central portion of the Rondout Creek Watershed from the Rondout reservoir to the Eddyville dam, the completion of a municipal questionnaire that was used to draft a State of the Rondout Report, and multiple public education events. The RCWC also facilitated the adoption of an Intermunicipal Agreement among the four major municipalities, the Towns of Wawarsing, Rochester, Marbletown and Rosendale, for the development of a Rondout Creek Watershed Management Plan. A second grant from HREP supported Clearwater and HBRW to incubate parallel efforts in the Catskill and

Kinderhook/Stockport Creek watersheds in partnership with Cornell Cooperative Extension of Greene County/Agroforestry Center. In 2010, the New England Interstate Water Pollution Control Commission provided additional funding for completion of the project.

### **1.3 Rondout Creek Interim Watershed Management Plan (RCIWMP)**

The purpose of this document, created by the RCWC for the lower, non-tidal portion of the Rondout Creek, is to provide civic leaders, policy makers, community groups and individual citizens with comprehensive information about the state of the Rondout Creek and actions that are needed to enhance water quality and quality of life within the watershed boundaries. The plan acts to identify current information that will help inform interested parties about what is known about the watershed, as well as pointing out the unknowns, thus suggesting what research is needed and what future actions should be taken. The plan is based upon the results garnered from a Municipal Watershed Questionnaire (MWQ) (*Appendix A*), water quality data gathered by Hudson River Basin Watch (*cross reference Section 4*), and pertinent information gathered from RCWC stakeholders.

Since this plan covers only a portion of the Rondout Creek, it is serving as an interim plan. The New York City Department of Environmental Protection has developed a management plan for the upper portion of the Rondout Creek. A plan for the tidal portion is currently underway. The RCWC envisions that the management plans for these three sections of the Rondout will be combined into one complete document addressing the needs and providing information about the entire Rondout Creek Watershed.

### **1.4 RCWC Watershed Assessment Process**

#### **Municipal Watershed Questionnaire Summary**

In 2007 the Rondout Creek Watershed Council designed and implemented a MWQ to evaluate the perspectives held by local municipalities about the condition of the watershed. This was then updated in the fall of 2009. The MWQ was distributed to the four municipalities which occupy the most land in the lower non-tidal portion of the Rondout Creek watershed area, with four distinct goals:

1. To assist municipalities in assessing what is known about the current health of the Rondout Creek watershed within their jurisdictions.
2. To create a convenient inventory of all relevant watershed management information to be used by decision makers and local agencies that are working toward watershed management.
3. To identify areas in which additional research is required.
4. To target the major areas of concern for each municipality and use them as focal topics for watershed management planning.

A total of eight representatives from each municipality’s local Environmental Conservation Commissions (ECC) in the towns of Wawarsing, Rochester, Marbletown, and Rosendale completed the questionnaire(s) (*Appendix B*).

**Assets Identified in the MWQ**

Participants of the survey identified significant assets of the watershed. These included the use of the watershed as a source of drinking water, its historic and scenic values, and tourism and recreational activities such as fishing, boating, swimming and bird watching. Even though it was apparent that public use of the creek was important in all of the municipalities, official public access points to the creek are limited and have not been officially identified. The questionnaire also asked participants to identify characteristics of the watershed in need of protection. Responses included aquifers, wetlands, floodplains, forested areas, and agricultural lands. In addition, special viewsheds such as the Shawangunk Ridge and Catskill Park and the karst regions in the watershed add to the historical and scenic value of the region. The fact that the Rondout Creek has been designated as a waterway of historical importance, as well as the fact that it provides habitat for rare and endangered species, reaffirms the necessity of protecting these unique areas.

Significant work is in progress or has been completed and adopted to ensure protection of the watershed and natural resources in all four municipalities. The plans and reports selected as strong representations of watershed protection initiatives are Comprehensive Plans, Natural Resource Inventories, Open Space Plans, Biodiversity Assessments, Water Resource Inventories, well-log data and watershed ordinances. Table 1.1 presents the consolidated responses for all work that is in progress or has been completed in each municipality.

Document	Wawarsing	Rochester	Marbletown	Rosendale
Comprehensive Plan	C	C	C	C
Natural Resource Inventory (NRI)		C	C	C
Open Space Plan		IP	C	
Biodiversity Assessment			C	C
Water Resource Inventory	IP	C	C	C
Well-Log Data		IP	C	C
Watershed Ordinance				

**Table 1.4.1** Consolidated watershed resource management and protection documents that are in progress (indicated by “IP”) or that have been completed (indicated by “C”).

Rosendale and Warwarsing are currently in discussion about cooperating on the development of their respective Open Space Plans.

## **Challenges Identified in the MWQ**

Thirteen categorical options were provided to survey participants to identify the existing challenges to watershed conservation. Their replies indicate that there are 12 perceived potential and existing threats to the health of the Rondout Creek Watershed: flooding, facilities requiring State Pollution Discharge Elimination System (SPDES) permits (*Appendix C*), historic discharges, filling of wetlands, streams with fish advisories, improper drainage, brownfields, dried up streams, Toxic Release Inventory (TRI) (*Appendix D*) listing, inadequate wetland protection, non-point source pollution and invasive species. Common threats identified by all four municipalities were: areas that have existing SPDES permitting, filled in wetlands, and occurrences of flooding events. Recommendations derived from this questionnaire have been incorporated in the recommendations outlined in this management plan.

### **1.5 RCWC Vision and Goals of the RCIWMP**

The RCWC is committed to protecting water resources, increasing community awareness through education and improving conservation efforts throughout the Rondout Creek Watershed. To further this purpose RCWC has developed the following Interim Watershed Management Plan focused on the four municipalities of the Lower, Non-Tidal portion of the Rondout Creek. The Plan will focus on the following key watershed protection goals for the lower non-tidal portion of the watershed and specified by local stakeholders.

1. Stormwater Management: Identify stormwater regulations and best practices that are currently in use in the watershed; it addresses the impacts of impervious surfaces, as well as options that maximize groundwater recharge and reduce or minimize incidents of flooding in the watershed, such as better site design and green stormwater infrastructure.
2. Floodplain Management: Address the sustainable management of riparian buffers, climate change issues, the need to use revised floodplain maps in planning, and promote access to the creek and its tributaries, where appropriate.
3. Agriculture and Forestry: Identify best management programs and practices for agriculture and forestry, which address water quality and quantity issues, open space preservation, biodiversity and wetlands protection in the watershed.
4. Outreach and Education: Identify existing programs and potential partnerships that foster stewardship and education throughout the watershed