

# **WATERSHED RESTORATION PLAN FOR THE UPPER COHANSEY RIVER WATERSHED**

## **SCOPE OF WORK**

### ***Background Information***

The proposed watershed study area for the Upper Cohansey River is 30.4 square miles. Based upon numerous monitoring sources including the NJDEP AMNET program, the NJDEP/USGS water quality monitoring network, and the Metal Recon Program, the Upper Cohansey River is impaired for aquatic life, phosphorus, pH, lead, and listed on Sublist 5 of the *New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report*. Additionally, a Total Maximum Daily Load (TMDL) for fecal coliform has been proposed for 33.8 miles of the Upper Cohansey River (See Figure 2). This TMDL requires 66% reductions in fecal coliform from medium/high density residential, low density/rural residential, commercial, industrial, mixed urban/other urban, forest, and agricultural lands. The goal of this project is to improve the water quality of the Upper Cohansey River by developing a Watershed Restoration Plan that achieves the required TMDL reductions as well as reduces the nonpoint source pollutant loading that is contributing to the additional aquatic life, phosphorus, pH, and lead surface water quality impairments.

Additionally, this effort will benefit from the use of a detailed study previously funded by the NJDEP, known as the Upper Cohansey River Watershed Management Project. Over a three year period, this project provided for water quality monitoring on the Upper Cohansey River at five locations between Beal Road in Salem County to Seeley Pond (See Figure 3). Furthermore, monitoring and management strategies identified at nursery operations in the watershed will be expanded upon in this watershed-based plan. The Cumberland County Soil Conservation District has also successfully installed 25 acres of riparian and agricultural buffers in the Upper Cohansey (see Figures 4 and 5) and has installed fencing to keep farm animals away from the waters' edge. The Cumberland County Soil Conservation District is targeting a total of 75 acres of buffers in the next coming years.

According to conversations with the Philadelphia District of the Army Corps of Engineers, no current ACOE projects are ongoing or planned within this targeted watershed.

### ***Root Cause Analysis***

Although available data clearly shows that the Upper Cohansey River above Seeley Pond is impaired, the source and causes of these impairments are not generally known (see Attachment A for a summary of this project). Though the TMDL for the Upper Cohansey River requires 66% reductions in nonpoint source fecal coliform loads for all non-natural land uses, the TMDL does not identify specific sources or management measures to achieve these desired reductions. The development of this Watershed Restoration Plan will provide the necessary information to: 1) identify the sources and causes of nonpoint source pollution including new water quality data, 2) identify management measures to address each of the causes, 3) estimate the reductions in nonpoint source pollution that would result from implementing these management measures, and 4) identify funding sources for implementing these measures. This Watershed Restoration Plan will outline a plan for the systematic implementation of management measures to achieve the desired TMDL reductions. The plan will have an immediate positive effect on the watershed by

identifying opportunities for the local Soil Conservation Districts and County Cooperative Extension Offices to target farmers for implementing environmental management and conservation practices.

### ***Goals and Objectives***

The goal of this project is to develop a Watershed Restoration Plan that will detail the management measures needed to achieve the TMDL, and reduce the nonpoint source pollutant loading that is contributing to the additional aquatic life, phosphorus, pH, and lead surface water quality impairments, restoring the health of the Upper Cohansey River. This goal will be accomplished by achieving the following objectives:

- Within one year of the initiation of this project, Rutgers will clearly identify and quantify the nonpoint sources of fecal coliform, aquatic life, phosphorus, lead, and pH that are causing impairments to the Upper Cohansey River through reviewing available data, conducting additional water quality sampling under a NJDEP approved Quality Assurance Project Plan (QAPP), and conducting visual assessments. The local partners will assist Rutgers in the field work that is associated with achieving this objective.
- Within two years of the initiation of this project, the existing data and newly collected data will be used to develop a water quality model of the watershed to better determine the load reductions needed to achieve water quality criteria.
- Within 2½ years of the initiation of this project, a Watershed Restoration Plan will be completed and provided to the various stakeholders for final review.
- The Watershed Restoration Plan will be designed to achieve the 66% reduction in fecal coliform as determined by the TMDL (or a refined percentage as defined during the study) so that the Upper Salem will meet standards for fecal coliform, and reduce the nonpoint source pollutant loading that is contributing to the additional aquatic life, phosphorus, pH, and lead surface water quality impairments.

### ***Tasks***

At the onset of the project, an Advisory Committee of stakeholders will be formed to help guide the efforts of the project. This Committee will meet on a regular basis to discuss the assessment methodologies used in this project and the results generated from these assessments. This Advisory Committee will also focus its efforts on identifying funding opportunities for implementation of nonpoint source pollution controls. Furthermore, the Advisory Committee will assist in identifying additional partners to participate in the project. The end result of working with an Advisory Committee in this work will be the realization of projects recommended in this watershed-based plan.

Task 1: Conduct assessments to identify causes and sources of pollution within the watershed that will need to be controlled to achieve load reductions. Project partners will use an enhanced version of the United States Department of Agriculture's (USDA) Stream Visual Assessment Protocol to assess the health of the stream, identify pollutant sources, and identify potential Best Management Practices (BMPs) to control these pollutant sources. A web-based data entry system will be developed to allow volunteers to quickly and efficiently enter their assessment data into a watershed-wide database. These data will be incorporated into a GIS for the watershed. Rutgers will lead this effort with assistance from the Soil Conservation District office.

Task 2: Assess available biological and chemical data to determine gaps in the data and to evaluate existing pollutant loadings from various sources. Rutgers will generate a report that outlines the results of this task, with the aid of the Rutgers Cooperative Extension of Salem County and Cumberland County offices.

Task 3: Prepare a QAPP to collect biological and chemical data to fill the data gaps. Rutgers will complete this task.

Task 4: Implement the QAPP, analyze the newly collected data, prepare a data report, and submit the data report to NJDEP. The project partners will assist Rutgers in data collection; Rutgers will prepare the data report.

Task 5: Perform water quality modeling to determine the necessary load reductions to achieve water quality criteria. This modeling effort will also be used to identify critical areas for implementing NPS management measures and the expected reductions that would result from these implemented management measures. A modeling report will be generated as a deliverable for this task. Rutgers will complete the water quality modeling effort and identify expected reductions from the implementation of various management strategies.

Task 6: Prepare a Watershed Restoration Plan that would include the nine minimum requirements as specified in the NJDEP “Request for Proposals for the SFY 2005 319(h) Grants for Nonpoint Source Pollution Control”, plus one additional requirement that has been added at the request of the NJDEP Nonpoint Source Program. These objectives are listed below.

- 1) Identify specific sources of pollution that will need to be controlled to achieve load reductions. This will be completed in Tasks 1-5, described above.
- 2) Detail management measures to control these sources and include the estimated reductions expected from each strategy’s implementation. Detailed management practices to control the sources identified in Task 6.1 will be selected. For each BMP, estimated pollutant reductions as documented by the best available literature values will be utilized
- 3) Describe the management measures to be implemented and map critical areas of where those measures should be implemented to improve water quality. Field reconnaissance of the watershed will be completed. Potential sites for management measures will be identified and located using a handheld GPS system. The GPS will allow exact site locations to be incorporated into a GIS, where analyses can be conducted using other GIS features, themes, and field data collection. For each site, a BMP will be identified for addressing the source of pollution at that site. The anticipated load reduction will be determined for the BMP selected. These reductions in loads will be compared to the overall goals of this project.
- 4) Estimate the technical and financial assistance needed to implement this plan, and estimate costs associated with these management strategies. Additionally, define possible sources of funding that may be able to assist in the implementation. This project will benefit greatly from vast experiences of the project partners in building, designing, and implementing BMPs. Estimations of technical assistance needed to implement this Plan will be developed

by the partners. Furthermore, estimations of financial needs of implementation will be produced. These values will include any necessary permits, materials, engineering costs, educational material expenses, and other factors.

5) Include a detailed information/educational component. At this time, it is anticipated that the informational/educational component will consist of detailed fact sheets, newsletters, and informational bulletins that need to be developed and distributed to the stakeholders, particularly farmers. It will also outline educational programs for twilight meetings and educational workshops that would be hosted jointly by Rutgers Cooperative Extension and the Soil Conservation District. These educational materials, meetings, and workshops will be targeted to further provide farmers information on nonpoint source pollution and assist them in implementing the appropriate environmental controls.

6) Rank initiatives to better direct resources to achieve pollutant load reductions. Initiatives will be ranked based on the percent removal of fecal coliform, phosphorus, pH, lead, and improvement to the aquatic life; cost-to-benefit analysis; and opportunity to implement (private land consideration, objection from landowner, acceptance from community, access and availability, etc.). Other factors, as decided upon by the project partners and the NJDEP, will be included to effectively prioritize implementation strategies for the watershed.

7) Provide a reasonably expeditious schedule for implementing these management strategies. The Cumberland/Salem Soil Conservation District (SCD), Rutgers Cooperative Extension, and Rutgers Cooperative Extension Water Resources Program currently have various projects ongoing in the watershed. Each partner has already developed a high level of trust among the local stakeholders. Furthermore, the municipalities support this project. Between these partners, a schedule of implementation can be designed that is both realistic and reasonably expeditious.

8) Describe interim, measurable milestones to determine if measures or control actions are being completed in the watershed. Within the framework of this project, a working group of stakeholders will be formed and will develop measurable milestones to determine if measures or control actions are being completed. Cumberland/Salem Soil Conservation District, Rutgers Cooperative Extension of Salem County, Rutgers Cooperative Extension of Cumberland County, and the Rutgers Water Resources Program have a vested interest in the success of this project and will continue to monitor the implementation of the recommended management strategies. It will be recommended that all applications for additional funding of projects recommended in this Plan cite the relevancy of this work. In addition, it will be recommended by project partners that a letter to the NJDEP Nonpoint Source Program be used to communicate the implementation of a project as per the Plan's recommendations. Finally, it is believed that incorporation of recommendations developed in this Plan by municipal governments will be important milestones in judging the success of this project. This is further detailed below in the "Project Evaluation Plan" section of this document.

9) Include a set of criteria for evaluating the effectiveness of each proposed management measure to evaluate the overall effectiveness of the plan. Criteria will be developed to link measurable load reductions to effectiveness of management measures. Existing data will

provide a solid baseline of watershed conditions prior to implementation of management strategies.

10) Include a monitoring component to evaluate the effectiveness of the implementation measures over time, measured against the criteria established above. Included with the Restoration Plan, a monitoring plan will be provided. This monitoring plan will make use of the locations used in the watershed assessment to gain a before and after perspective. This sampling plan will also make use of lessons learned during the field reconnaissance of the watershed; this includes accessibility, property ownership, and changes in land use, for instance.

In addition, Rutgers will prepare a preliminary draft of the Watershed Restoration Plan and present it to the project partners for their review and comment. As appropriate, the comments of the project partners will be incorporated into the final draft.

### ***Project Evaluation Plan***

The success of this project will be determined by how many management measures that are presented in the Watershed Restoration Plan are incorporated into the Municipal Stormwater Management Plans (MSWMPs) of the local municipalities. The MSWMP is a document that the municipality must develop and implement as part of the Municipal Separate Storm Sewer Systems (MS4) Stormwater Permitting Regulations. The MSWMP provides an outstanding method for the municipalities to adopt the management strategies presented in the Watershed Restoration Plan.

Another method for determining the success of this project is to determine how many funding solicitations are made to implement various management strategies that are outlined in the plan. The project partners will work with the agricultural community in the watershed to submit applications for US Farm Bill funds and NJ Conservation Reserve Enhancement Program (CREP) funds. The project partners have already had great success in working with farmers in the watershed to implement conservation buffers in critical areas. Over 25 acres of buffers have already been installed, and stream fencing will be installed this summer in the headwaters of the Upper Cohansey River to keep animals out of the stream. These efforts will continue throughout the duration of this project. The project partners will also work with local municipalities and watershed organizations to solicit funding for implementing non-agricultural and agricultural management measures.

Finally, project success will be measured by the load reductions achieved to meet water quality standards. The successful and complete implementation of measures outlined in the Upper Cohansey River Watershed Restoration Plan will result in the 66% reduction in fecal coliform (or the refined percent reduction determined during this study) as well as the reduction of the nonpoint source pollutant loading that is contributing to the aquatic life, phosphorus, pH, and lead surface water quality impairments.

***Project Implementation Schedule***

<b>Task</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Anticipated Start Data</b>	<b>Project Deliverable</b>	<b>Anticipated Completion Data</b>
1	Rutgers Water Resources Soil Districts County Extension	12 months	<b>M1</b>	GIS Updates and Data Entry	<b>M12</b>
2	Rutgers Water Resources	Three months	<b>M1</b>	Report	<b>M3</b>
3	Rutgers Water Resources	one month	<b>M4</b>	QAPP	<b>M4</b>
4	Rutgers Water Resources Soil Districts County Extension	18 months	<b>M5</b>	Data Report	<b>M22</b>
5	Rutgers Water Resources	18 months	<b>M7</b>	Modeling Report	<b>M24</b>
6	Rutgers Water Resources Soil Districts County Extension	12 months	<b>M7</b>	Final Watershed Restoration Plan	<b>M30</b>

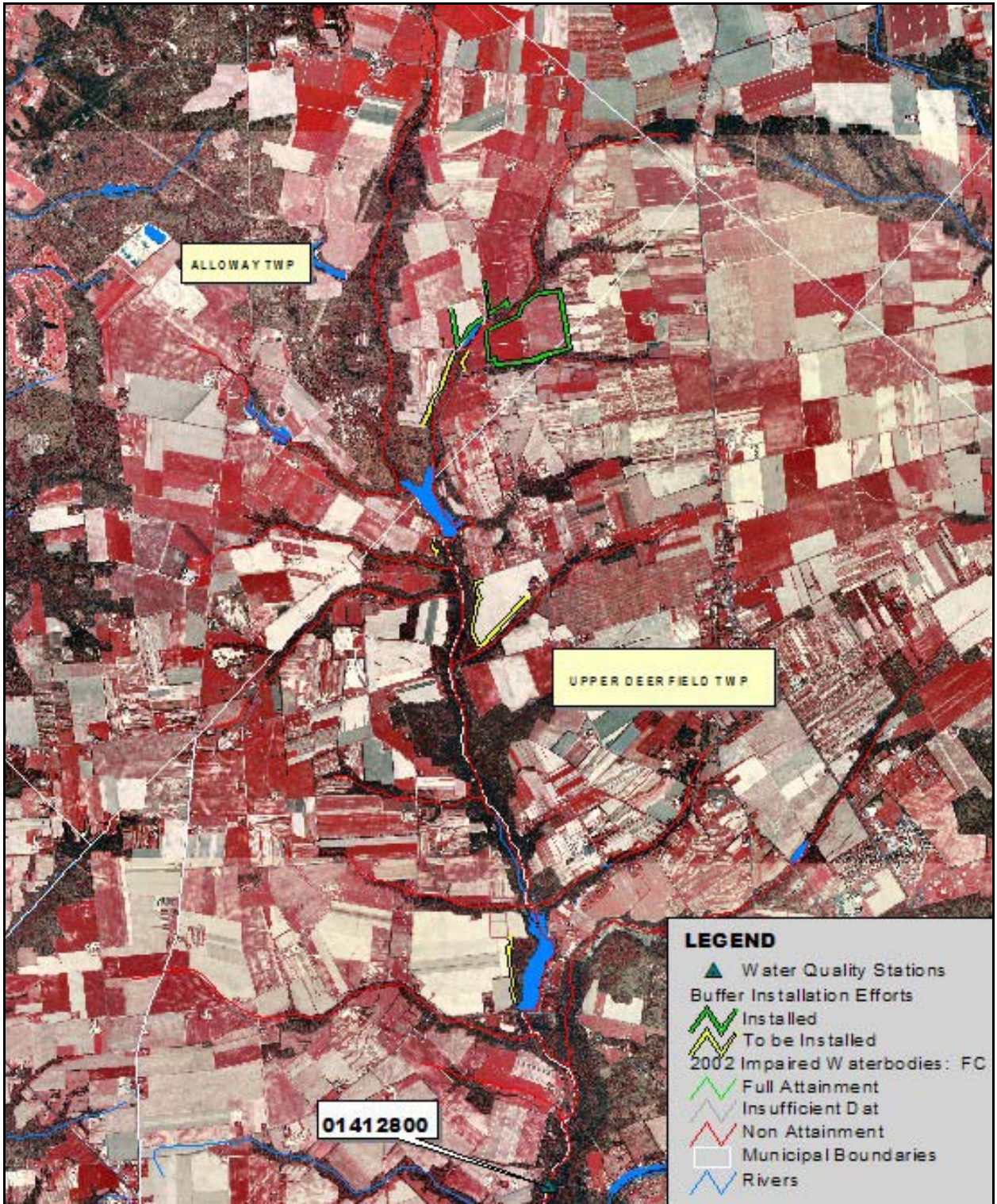
*“M” refers to Month.*

***Conclusion***

This project provides a unique opportunity for the NJDEP to effectively reach out to the farm community by building upon an existing relationship between the project partners and the agricultural community. This project will develop a watershed restoration plan that will serve as a tool for the watershed stakeholders to systematically implement conservation and management practices that will achieve the desired TMDL reductions and reductions in the nonpoint source loading contributing to the phosphorus, lead, pH and aquatic life impairments. The plan will allow the project partners to solicit farmers in critical areas to take advantage of the financial incentives available for implementing environmental controls. Never before has the NJDEP been offered such an ideal opportunity to focus efforts on an agriculturally dominated watershed where the needs are so great and the willingness to participate exists. Building upon the established trust of the project partners, this project will develop an effective plan that will be implemented to improve the water quality of the Upper Cohansey River.



Figure 2. Aerial Map of the Upper Cohansey River



Data Sources: NJDEP 1995/97 Digital Orthophotography; NJDEP 2002 Integrated List of Impaired Waterbodies; NJDEP GIS Data



Figure 4. Riparian Corridor Vegetation Implemented by the Cumberland County Soil Conservation District and Landowner



Figure 5. Agricultural Buffers Installed by the Cumberland County Soil Conservation District and Landowner

