



**US Army Corps  
of Engineers  
New York District**

**SECTION 905(B) RECONNAISSANCE STUDY**  
**Ten Mile River Watershed, Dutchess County, NY**  
**and Litchfield County, CT**



**U.S. Army Corps of Engineers  
New York District  
26 Federal Plaza  
New York, New York 10278-0090**

**February 2008**

## SECTION 905(b) RECONNAISSANCE STUDY

### TEN MILE RIVER WATERSHED, DUTCHESS COUNTY, NEW YORK AND LITCHFIELD COUNTY, CONNECTICUT

#### 1. STUDY AUTHORITY

a. This Section 905(b) of the Water Resources Development Act of 1986 (WRDA 1986) Analysis was prepared as an initial response to the resolution adopted by the House Committee on Transportation and Infrastructure of the United States, Docket 2753, dated April 5, 2006, which reads as follows:

*“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army is requested to review the report of the Chief of Engineers on the Housatonic River, Connecticut Federal Navigation Channel submitted as House Document 449, 70<sup>th</sup> Congress, and other pertinent reports, to determine whether any modifications to the recommendations contained therein are advisable at the present time in the interest of shoreline protection, flood control, ecosystem restoration, streambank erosion protection, and other related purposes in the vicinity of Ten Mile River, Dutchess County, New York, and Litchfield County, Connecticut.”*

b. Funds in the amount of \$100,000 were appropriated in Fiscal Year 2007 to conduct the Reconnaissance phase of the study.

#### 2. STUDY PURPOSE

The purpose of the reconnaissance phase study is to determine whether there exists a Federal (Corps) interest in participating in a cost shared Feasibility Phase Study of the desirability of flood damage reduction, ecosystem restoration, streambank erosion protection, and other related purposes in the Ten Mile River Watershed in Dutchess County, New York and Litchfield County, Connecticut. In response to the study authority, the Reconnaissance Study was initiated in September 2007. The Reconnaissance Study has resulted in the finding that there is a Federal interest in continuing the study into the feasibility phase. The purpose of this Section 905(b) (WRDA 1986) Analysis is to document the basis for this finding and establish the scope of the feasibility phase. As the document that establishes the scope of the feasibility study, the Section 905(b) (WRDA 1986) Analysis is used as the chapter of the Project Management Plan that presents the Reconnaissance overview and formulation rationale.

#### 3. LOCATION OF STUDY, NON-FEDERAL SPONSOR AND CONGRESSIONAL DISTRICTS

a. The study area is the Ten Mile River Watershed, which is located in eastern Dutchess County, New York, and Litchfield County, Connecticut (See Figures 1 and 2). The major rivers within the Ten Mile River watershed include the Wassaic River, Weatuck Creek,

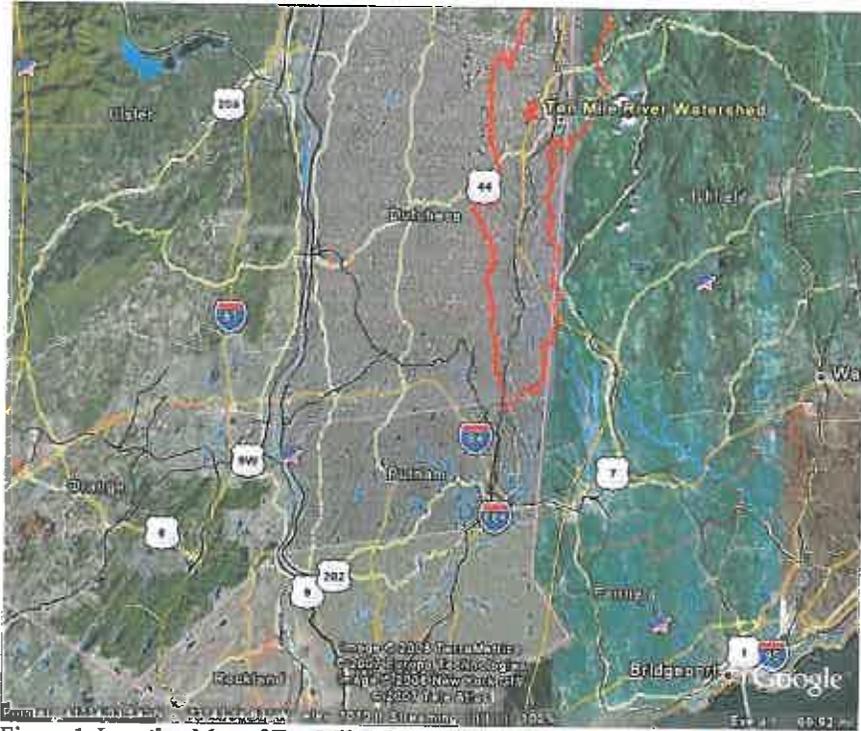


Figure 1. Location Map of Ten Mile River Watershed within Dutchess County, NY

## 5. PLAN FORMULATION

During a study, six planning steps that are set forth in the Water Resource Council's Principles and Guidelines are repeated to focus the planning effort and eventually to select and recommend a plan for authorization. The six planning steps are: 1) specify problems and opportunities, 2) inventory and forecast conditions, 3) formulate alternative plans, 4) evaluate effects of alternative plans, 5) compare alternative plans, and 6) select recommended plan. The iterations of the planning steps typically differ in the emphasis that is placed on each of the steps. In the early iterations, those conducted during the reconnaissance phase, the step of specifying problems and opportunities is emphasized. That is not to say, however, that the other steps are ignored, because the initial screening of preliminary plans that results from the other steps is very important to the scoping of the follow-on feasibility phase studies. The sub-paragraphs that follow present the results of the initial iterations of the planning steps that were conducted during the reconnaissance phase. This information will be refined in future iterations of the planning steps that will be accomplished during the feasibility phase.

### a. National Objectives:

1) The national or Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to National Economic Development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the nation.

2) The Corps has added a national objective for Ecosystem Restoration in response to legislation and administration policy. This objective is to contribute to the nation's ecosystems through ecosystem restoration, with contributions measured by changes in the amounts and values of habitat.

b. Public Concerns: A number of public concerns have been identified during the course of the reconnaissance study. Initial concerns were expressed in the study authorization. Additional input was received through coordination with the potential non-Federal and local sponsors, and some initial coordination with other agencies. The public concerns that are related to the establishment of planning objectives and planning constraints are:

1) Ability to enter the stream and remove debris and snags throughout the waterway.

2) Emphasis on a watershed approach with concern that individual projects will not be emphasized at the expense of failure to take into proper account upstream and downstream conditions.

3) Concerns over erosion, bank and property loss, sedimentation, flooding and ecosystem degradation.

4) Implementation of the project in an efficient and timely manner.

c. **Problems and Opportunities:** The evaluation of public concerns often reflects a range of needs, which are perceived by the public. This section describes these needs in the context of problems and opportunities that can be addressed through water and related land resource management. For each problem and opportunity, the existing conditions and the expected future conditions are described, as follows:

1) **General Problem Identification.** The water resources problem to be solved is that the current hydrologic regimes of the rivers and streams in the Ten Mile River Watershed within Dutchess and Litchfield Counties cause erosion and repeated flood damage to public and private property, to infrastructure, and constitute threats to human life. The continued sediment transport results in ecosystem degradation and impacts the economy and recreational features of the watershed. The causes of these problems can be ascribed to the following suite of factors:

a) **Reduced Stream Capacity:** Due to sediment aggradation throughout the watershed, erosion of streambanks and uncontrolled sediment transport, channels of the mainstem Ten Mile River and its tributaries are filling with sediment. The severe bank erosion results in changes in channel dimension as well as horizontal movement of the channels, which results in a loss of vegetation, wash-out of roadways and other infrastructure and loss of public and private lands. Erosion is the main causal agent for sediment accumulation and ecosystem degradation within the Ten Mile River and its tributaries and it contributes to flooding in the area through restriction of channel capacities. The sandbars and islands that form in the river cause changes in the hydraulic regime and result in reduced flood capacity and lead to flooding, erosion and loss of habitat. These issues are found throughout the Ten Mile River Basin, specifically along the Webatuck Creek in the Town of Northeast, the Wassaic Creek in the Town of Amenia and Hamlet of Wassaic and the mainstem of the Ten Mile River throughout the Town of Dover and Dover Plains. This condition is expected to continue and worsen in the without project future condition.

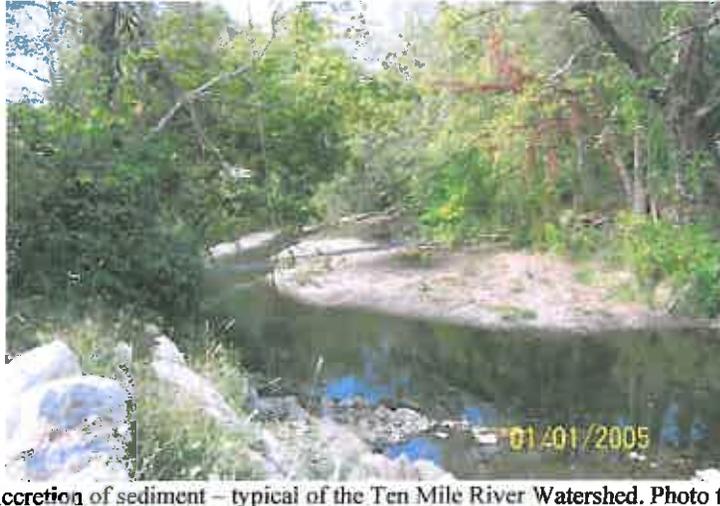


Figure 3. Accretion of sediment – typical of the Ten Mile River Watershed. Photo taken October 5, 2007



Figure 4. Bank Erosion and Road/Bridge washout. Photo taken April 20, 2007.

b) Flooding is also a major concern expressed by the public - Flooding occurs throughout the Ten Mile River Basin and causes significant damages in populated areas and appears to be worsened by the reduced channel capacity discussed above. The primary commercial and residential areas damaged by flooding are in the Hamlet of Wassaic and Dover Plains. The situation would likely worsen in without project future conditions.



**Figure 5. Flooding in Dover Plains, NY from the Ten Mile River. Photo Taken April 16, 2007.**



**Figure 6. Flooding in Wassaic, NY during the April 2007 nor'easter.**



Figure 7. Flooding in Dover Plains, NY during the April 2007 nor'easter.

c) Obstructions of the channel are found throughout the Ten Mile River Basin. These obstructions are typically in the form of debris jams, large trees, and culverts and can cause a “damming” effect upstream of the obstruction.

d) The degradation of the Ten Mile River Basin ecosystem has also been raised as a concern by the public. Ecosystem degradation of the Ten Mile River and tributaries and the basin as a whole is significantly increased by erosion and sedimentation. As erosion driven sediment accumulates the channel dimensions and depth decrease. The erosion negatively impacts flora and fauna in the study area, especially aquatic species such as Brown Trout. The Ten Mile River is classified by NYSDEC as a Class B (Trout) stream. In accordance with §701.7 of the New York State Environmental Conservation Law, Class B fresh surface waters is defined as waters where “the best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.” By this definition, the Ten Mile River Watershed could provide the habitat for fish propagation and survival, however, anecdotal discussions indicate that Brown Trout populations have Therefore, the erosion and sediment aggradation throughout the watershed is impacting the fishery resources in the Ten Mile River Basin. This trend is expected to continue in the without project future condition.

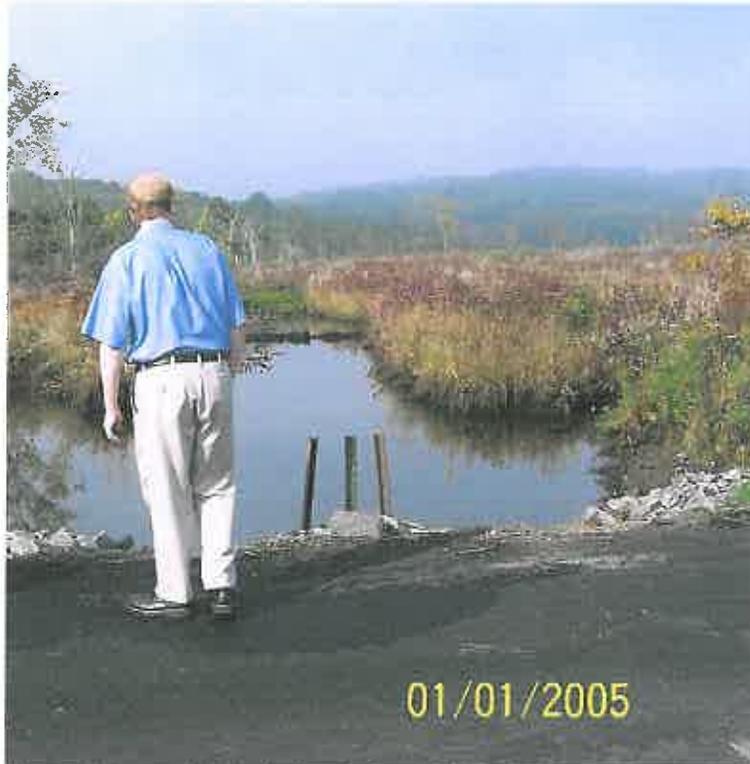


Figure 8. Perpetually flooded wetland complex in the Town of Northeast – prime Bog Turtle habitat. Photo taken October 5, 2007.

2. Opportunities. Opportunities exist throughout the Ten Mile River Watershed study area to address the problems of fluvial flood damages, streambank erosion, sediment aggradation, and ecosystem degradation. Local interests have expressed the urgency of working together to find long-term comprehensive solutions.

d. Planning Objectives: The objectives of National Economic Development and National Ecosystem Restoration are general statements and not specific enough for direct use in plan formulation. The water and related land resource problems and opportunities identified in this study are stated as specific planning objectives to provide focus for the formulation of alternatives. These planning objectives reflect the problems and opportunities and represent desired positive changes in the without project conditions. The planning objectives are specified as follows:

- 1) To reduce bank erosion and attendant sediment accumulation and stream aggradation throughout the Ten Mile River Basin.
- 2) To reduce flood damages throughout the populated centers of the Ten Mile River Basin, including the Towns of Northeast, Amenia and Dover in Dutchess County, NY.
- 3) To improve ecosystem habitats, especially for Trout and Bog Turtle in the Ten Mile River Basin.

e. **Planning Constraints:** Unlike planning objectives that represent desired positive changes, planning constraints represent restrictions that should not be violated. The planning constraints identified in this study are as follows:

- 1) Compliance with local land use plans – Dutchess County Soil and Water Conservation District initiatives for sediment erosion control.
- 2) Avoid negative effects on habitat of Federal and State threatened and endangered species within the study area;
- 3) Plans cannot unreasonably impact environmental or cultural resources; and
- 4) Flood damage reduction measures must not induce flooding to other unprotected areas either upstream or downstream.

f. **Measures to Address Identified Planning Objectives.** A management measure is a feature or activity at a site, which address one or more of the planning objectives. A wide variety of measures were considered, some of which were found to be infeasible due to technical, economic, or environmental constraints. Each measure was assessed and a determination made regarding whether it should be retained in the formulation of alternative plans. The descriptions and results of the evaluations of the measures considered in this study are presented below:

1) **No Action.** The Corps is required to consider the option of “No Action” as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act (NEPA). No Action assumes that no project would be implemented by the Federal Government or by local interests to achieve the planning objectives. No Action, which is synonymous with the Without Project Condition, forms the basis from which all other alternative plans are measured.

(2) **Non-Structural.** Various non-structural alternatives, including buy-outs, elevating structures and flood-proofing will be considered.

(3) **Structural.** Measures such as road raising, snagging and clearing, floodwalls and levees, and re-channelization may be examined. For streambank stabilization and erosion control, a combination of hard, bio-engineering, and soft stabilization measures may be studied as well as in-stream control structures such as groins or bend-way weirs. In addition, other structures such as check dams and step pools may assist with sediment management while providing habitat improvements for the trout fishery.

(4) **Separable Features.** Additional features for ecosystem restoration may include creation of riffle and pool complexes, installation of small check dams and planting of pocket wetlands in areas to enhance the trout fishery. In addition, there are a few large wetland complexes in the Ten Mile River Watershed which provide prime habitat for endangered and threatened species, such as the Bog Turtle. Some of these wetlands may

be contiguous with The Great Swamp, a 6,000 acre wetland complex in Dutchess and Putnam Counties.

(5) Additional Measures for Complete Alternatives. The feasibility-level analysis may identify measures that might be required to generate a “complete” alternative. These may also include elements of an overall project in which the Corps does not, at present, have authority to be a cost-sharing participant. Soil erosion control features will be included in several alternatives for which there is no existing Corps authority, but for which their inclusion may be required to generate a “complete” plan.

g. Conclusions. The discussion above indicates that alternatives that provide flood damage reduction, ecosystem restoration and watershed management have the greatest potential for implementation. The potential magnitude and types of benefits from the proposed actions would include National Economic Development, Regional Economic Development, Other Social Effects, and Environmental Quality. Likewise, the environmental effects are dependent upon the scope and magnitude of the solution. Detailed costs of the alternatives will be developed during the next phase of the study, however, based on the benefit categories discussed above, there appears to be significant benefits available in this study area. Therefore, alternatives to address the planning objectives appear viable.

h. Establishment of a Plan Formulation Rationale. The conclusions form the basis for the next iteration of the planning steps that will be conducted in the Feasibility Phase. The likely array of alternatives that will be considered in the next iteration include the no action alternative as well as both structural and non-structural alternatives, including those stated in Section 5.f of this report. Future screening and reformulation will be based on ER 1105-2-100 and all other current Corps guidance and regulations, including EC 1105-2-409.

## 6. FEDERAL INTEREST

Because flood damage risk reduction and ecosystem restoration are outputs with high budget priorities and those are the primary outputs of the alternatives to be evaluated in the feasibility phase, there is a strong Federal interest in conducting the feasibility study. There is also a Federal interest in other related outputs of the alternatives, including watershed management, erosion control, and recreation that could be developed within existing policy as part of a larger watershed study. Based on the preliminary screening of alternatives, there appears to be an array of project alternatives that have the potential to be economically justified, environmentally acceptable, addressable through engineering solutions, and be consistent with USACE policies.

Federal Interest is supported by the Federal Disaster Declaration issued following the flooding that occurred during the April 14-18, 2007 period during which the lower Hudson Valley and Harlem River Valley including Dutchess County, was struck by a nor'easter, that caused significant flooding, damage, and loss of life. On April 24, 2007, a Presidential Disaster Declaration (FEMA-1692-DR, New York) was issued for most of the Lower Hudson Valley as well as other affected counties in the state. The declaration covers 14

counties, including Albany, Columbia, Dutchess, Essex, Greene, Montgomery, Orange, Putnam, Richmond, Rockland, Schoharie, Suffolk, Ulster, and Westchester.

## 7. PRELIMINARY FINANCIAL ANALYSIS

As the local sponsor, Dutchess County will be required to provide 50 percent of the cost of the feasibility phase. The local sponsor is also aware of the cost sharing requirements for potential project implementation. A letter of intent from the local sponsor stating a willingness to pursue the feasibility study and to share in its cost, and an understanding of the cost sharing that is required for project construction is included as Attachment A.

## 8. ASSUMPTIONS AND EXCEPTIONS

a. Feasibility Phase Assumptions: The following critical assumptions will provide a basis for the feasibility study:

1) In the absence of Federal action, the flood damages will occur again, possibly with increasing frequency and intensity, imperiling the lives of individuals and impairing the function of municipalities within the study area.

2) In the absence of Federal action, the streams within the Ten Mile River watershed will continue to aggrade, causing streambank erosion, loss of habitat and causing flood damages.

b. Policy Exceptions and Streamlining Initiatives: The study will be conducted in accordance with the Principles and Guidelines and the Corps of Engineers regulations. Exceptions to established guidance have been identified that will streamline the feasibility study process that will not adversely impact the quality of the feasibility study. Approval of the Section 905(b) Analysis by HQUSACE results in the approval of the following policy exceptions and streamlining initiatives:

1) In order to streamline the completion of the Feasibility Study and because this study is technically within the area of responsibility of New England District, a regional project delivery team will be used to deliver this study.

2) Coordination will be undertaken with non-Corps agencies to obtain information that may reduce or streamline the schedule or budget of the project, although this is not an exception to established guidance as long as information gained through coordination meets Corps criteria.

c. Other Approvals Required. As per EC 1105-2-409 § 4(c)(3), dated April 22, 2000, any alternative plan may be selected and recommended for implementation if it has, on balance, net beneficial effects after considering all plan effects, beneficial and adverse, in the four *Principles and Guidelines* evaluation accounts:

1) National Economic Development (NED): displays changes in the economic value of the national output of goods and services;

- 2) Environmental Quality: displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of ecosystem restoration plans;
- 3) Regional Economic Development: displays changes in the distribution of regional economic activity (e.g., income and employment); and
- 4) Other Social Effects: displays plan effects on social aspects such as community impacts, health and safety, displacement, energy conservation and others.

## 9. FEASIBILITY PHASE MILESTONES

Completion of Feasibility phase milestones will be conducted in accordance with ER 1105-2-100. Appendix H, Amendment #1, dated November 20, 2007.

## 10. FEASIBILITY PHASE COST ESTIMATE

Based on previous watershed-based multipurpose Feasibility studies conducted by the New York District, the cost estimate to complete the Feasibility Study recommended above is \$2.5 Million, inclusive of both the Federal and non-Federal expenses.

## 11. VIEWS OF OTHER RESOURCE AGENCIES

Because of the funding and time constraints of the reconnaissance phase, only limited and informal coordination has been conducted with other resource agencies. Views that have been expressed are as follows:

- a. The Dutchess County Soil & Water Conservation District would support a study of the Ten Mile River Watershed.
- b. The Nature Conservancy, which owns the Great Swamp and other large tracts of wetlands within the watershed, would support a study of the Ten Mile River Watershed.
- c. Negative impacts to wetlands, fish and wildlife resources should be avoided and minimized wherever practicable.
- d. Alternatives with unavoidable impacts should include mitigation measures that replace the function of the impacted area.

## 12. POTENTIAL ISSUES AFFECTING INITIATION OF FEASIBILITY PHASE

Continuation of this study into the cost-shared feasibility phase is contingent upon an executed FCSA. Failure to achieve an executed FCSA within 18 months of the approval date of the Section 905(b) Analysis will result in termination of the study. There are no apparent issues at this time that impact on the implementation of the feasibility phase.

### 13. PROJECT AREA MAP

A map of the study area is provided as Figures 1 and 2.

### 14. RECOMMENDATIONS

I recommend that the Ten Mile River, Dutchess County, New York, and Litchfield County, Connecticut study proceed into the feasibility phase. The feasibility phase will continue the investigation of erosion and sediment reduction, flood damage reduction, ecosystem restoration, water quality, and related issues in the Ten Mile River study area. The New York State Department of Environmental Conservation has expressed interest in cost sharing the feasibility study and initiating the Feasibility Cost Sharing Agreement upon completion of the Project Management Plan.

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Aniello L. Tortora**  
Colonel, U.S. Army  
District Commander