



Corps of  
Engineers,  
NY District

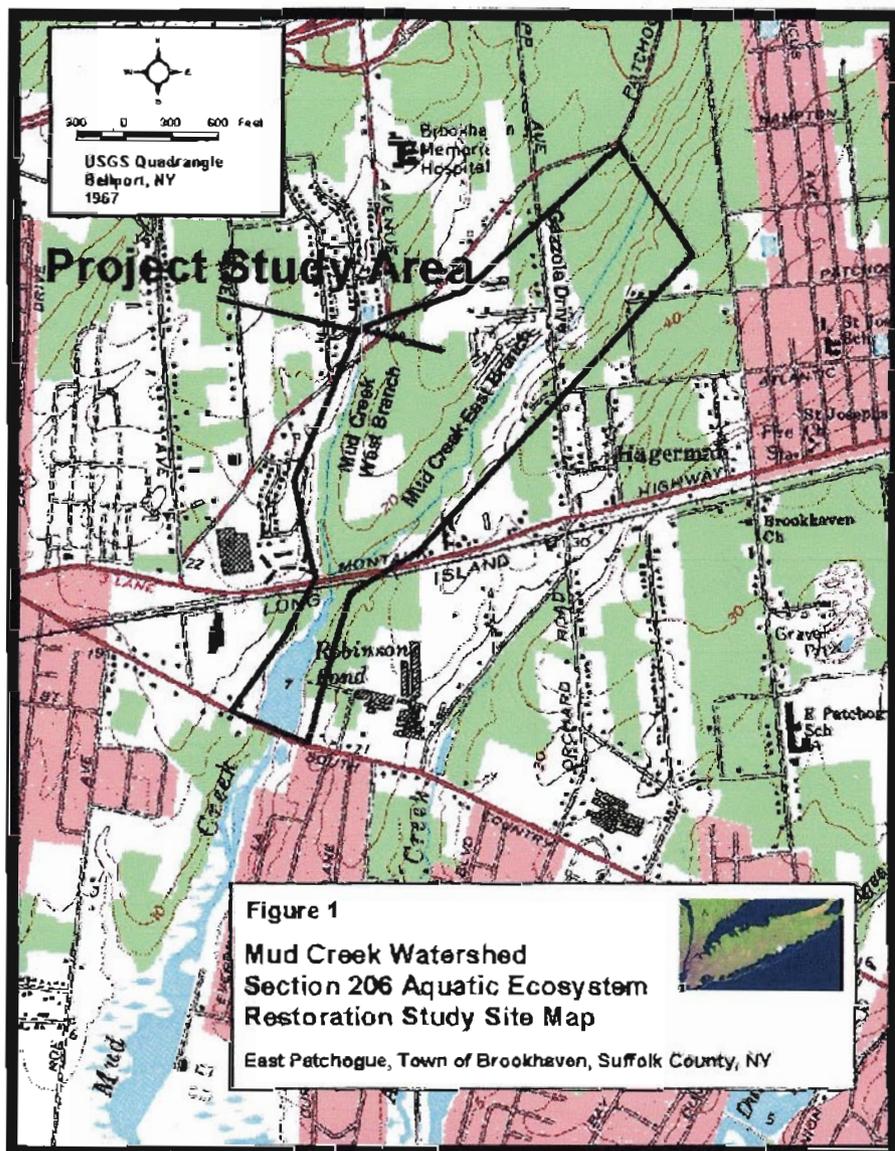
## Mud Creek Watershed Section 206 Aquatic Ecosystem Restoration Study Scoping Document March 2004

The U.S. Army Corps of Engineers, New York District (Corps) has partnered with Suffolk County, New York, to evaluate environmental restoration opportunities within the Mud Creek Watershed in East Patchogue, Town of Brookhaven, Suffolk County, NY.

The study was initiated under the authority of Section 206 of the Water Resources Development Act of 1996, as amended. The authority allows the Corps to partner with non-Federal public entities to pursue aquatic ecosystem restoration projects. The objective of a 206 project is to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition, which involves consideration of the ecosystem's natural integrity, productivity, stability and biological diversity.

### Primary Goal:

The Mud Creek 206 Study will focus on a primary goal to restore habitat conditions of the stream and floodplain (riparian) corridor of the East Branch of Mud Creek. The environmental quality of Robinson Pond will also be evaluated as part of the study, and the primary goal may be expanded based on watershed analysis.



**Site Conditions:**

The upper portion of the East Branch of Mud Creek was modified for duck farming in the early 1900's, and exists in a degraded state in comparison with the relatively untouched West Branch of Mud Creek. The streambed of the East Branch is currently dominated by common reed (*Phragmites australis*). Water quality is impaired through improper hydrologic connection, creating stagnant water through the stream and the detention ponds that are remnant landscape features from the duck farming operations. The West Branch, however, has existed as a naturally forested wetland corridor and stream channel. The West Branch of Mud Creek supports a heritage population of Brook trout. The West Branch serves as a reference site or "biobenchmark" for the habitat quality that could be achieved within and along the East Branch with the implementation of restoration activities.

**Heritage Brook Trout Population**

The West Branch is significant because it is the only Long Island stream system to support a naturally reproducing brook trout (*Salvelinus fontinalis*) population that has reportedly never been stocked. Brook trout sampled from Mud Creek were genetically tested in 1985 as part of the Heritage Brook Trout Project and were concluded to have evolved in isolation from other river basin strains of brook trout in New York (Perkins, D.L, C.C. Krueger and B. May).

The forested wetlands north of the former duck farm and east of Gazzola Drive have also not been altered and support high quality habitat that can be monitored as a reference site. The East and West Branch of Mud Creek join north of Montauk Highway. The joined waters flow through a culvert under the highway and flow into Robinson Pond. The waters of Robinson Pond exit through a culvert under South Country Road and into the lower reach of Mud Creek that is tidally influenced. The tidal portion of Mud Creek flows into Great South Bay. As mentioned previously, Robinson Pond will also be examined as part of the project to determine if waste solids remain in Robinson Pond and if removal of these solids would improve water quality and habitat conditions of the pond and downstream estuary.

**Site History:**

The targeted restoration site within the Mud Creek Watershed is a parcel of land formerly utilized by private owners as a duck farm. The East Branch of Mud Creek flows through this property. Gallo Duck Farm, Inc. operated a duck farm and also conducted limited turkey production on the property from the early 1900's through the early 1980's. The average number of ducks present on the farm at one time was estimated at 70,000 ducks on 11.9 acres of pens in the early 1970's. Up to 5 crops of ducks were potentially grown per year. The farm operation not only had direct physical impacts to the environment in this location through the construction of feedlots, pens, waste lagoons and barn structures, but also had a significant adverse impact on the aquatic habitat quality of the Mud Creek Watershed due to the tremendous amount of waste produced by the millions of ducks that were raised on the farm over the decades of operation.

Adverse offsite impacts were also very significant due to the high organic waste load discharged to the stream. During the period of duck farm operation, large volumes of duck sludge were deposited along the streambed and in Robinson Pond, and water quality degradation (nutrients and coliform contamination) was apparent in the tidal portion of Mud Creek and Great South Bay. Duck farms on Long Island, during their height of operation in the 1940's and 1950's, caused pollution of Great South Bay and Moriches Bay, which had a significant impact on oyster populations. As reported in Engineering News-Record of 1957, "Duck droppings, heavily laden with phosphates, fertilized algae growths with clogged the gills of the oysters. Then came parasitic, oyster-attacking worms whose growth was stimulated by the algae blooms. Finally the oysters were completely wiped out." The state pollution board classified waters in October 1951, which jumpstarted a pollution abatement program.



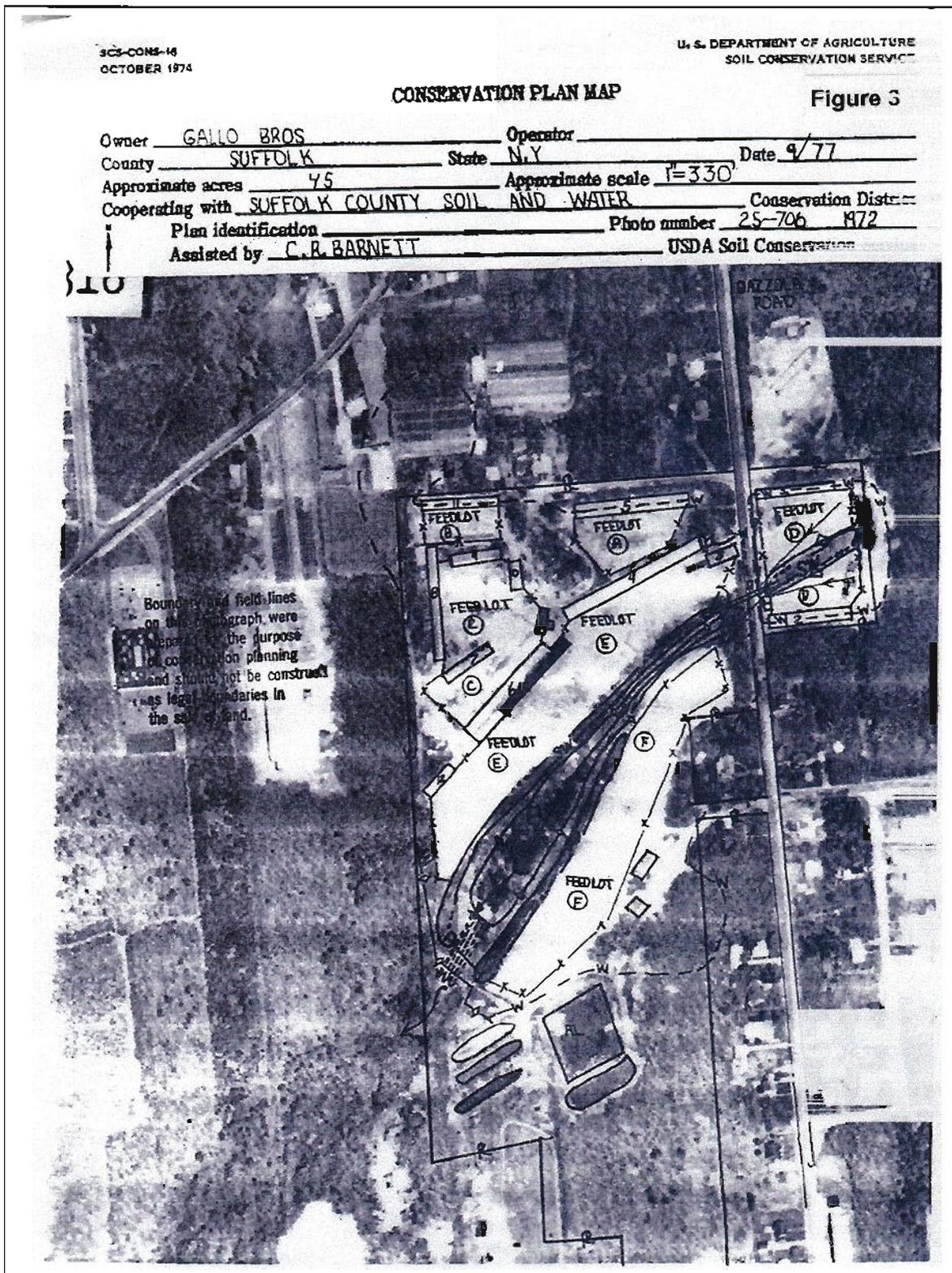
**Figure 2**  
In the 1950's and 60's there were approximately 120 duck farms on Long Island, and in 1969, these farms produced 60% of the nation's ducks. Today there are about 6 farms in operation<sup>1</sup>.

<sup>1</sup> Source: NY Times, Sunday February 10, 2002, Page 4. "Seeking to Reclaim the Land of Former Duck Farms" Carole Parquette.

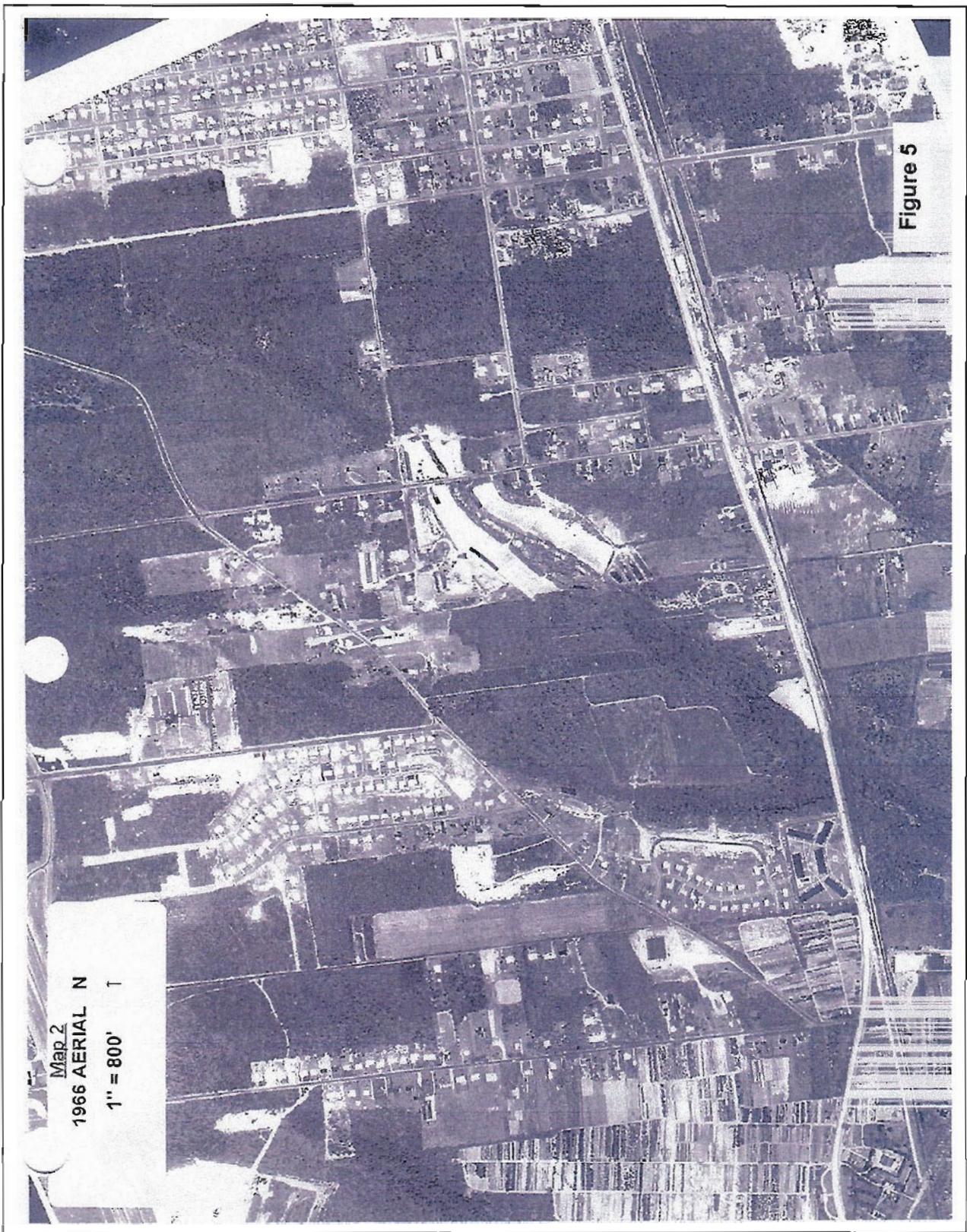
During the 1970's, the Suffolk County Soil and Water Conservation District worked in cooperation with the Gallo Brothers to develop and implement a Conservation Plan for the farm at Mud Creek (Figure 3). The plan was created to better manage the farm for improved water quality. The plan involved separation of feedlots and duck swimwater areas from the main, natural stream channel of the East Branch via dikes. The dikes were designed to prevent runoff from a 25-year storm event from reaching the natural stream corridor. Fences were also erected to prevent ducks from accessing the main stream channel. Concrete flumes were constructed east of Gazzola Drive on either side of the stream channel. Groundwater was pumped and fed through the flumes to the swimwater areas for the ducks. Excess groundwater may have been pumped at times to dilute waste and to lower levels of BOD (Biological Oxygen Demand). The main, natural stream channel was piped separately under Gazzola Drive. The waters from the swimwater areas on either side of the main stream channel, joined at the southern end of the property and were pumped to an aeration lagoon. From the aeration lagoon, the water may have been pumped to the 3 settling pits, possibly chlorinated and then released back into the natural stream heading south to Robinson Pond. The main stream channel was piped under access ways and eventually through one last set of 3-4 pipes to continue to discharge into the natural stream corridor heading south to Robinson Pond.

The development of the Gallo Duck Farm over time is illustrated through the series of aerial photographs available for the area dated 1930, 1966 and 1999 (Figures 4-6). As seen from the 1999 aerial, the lagoon and settling pits created as part of the Conservation Plan, and many of the now dilapidated farm buildings and structures are still in place today at the site. Prior to the implementation of the Conservation Plan, it is speculated that the topography of the farm site was altered through grading and use of fill material.

Figure 3 Conservation Plan Map for the Duck Farm Operation at Mud Creek



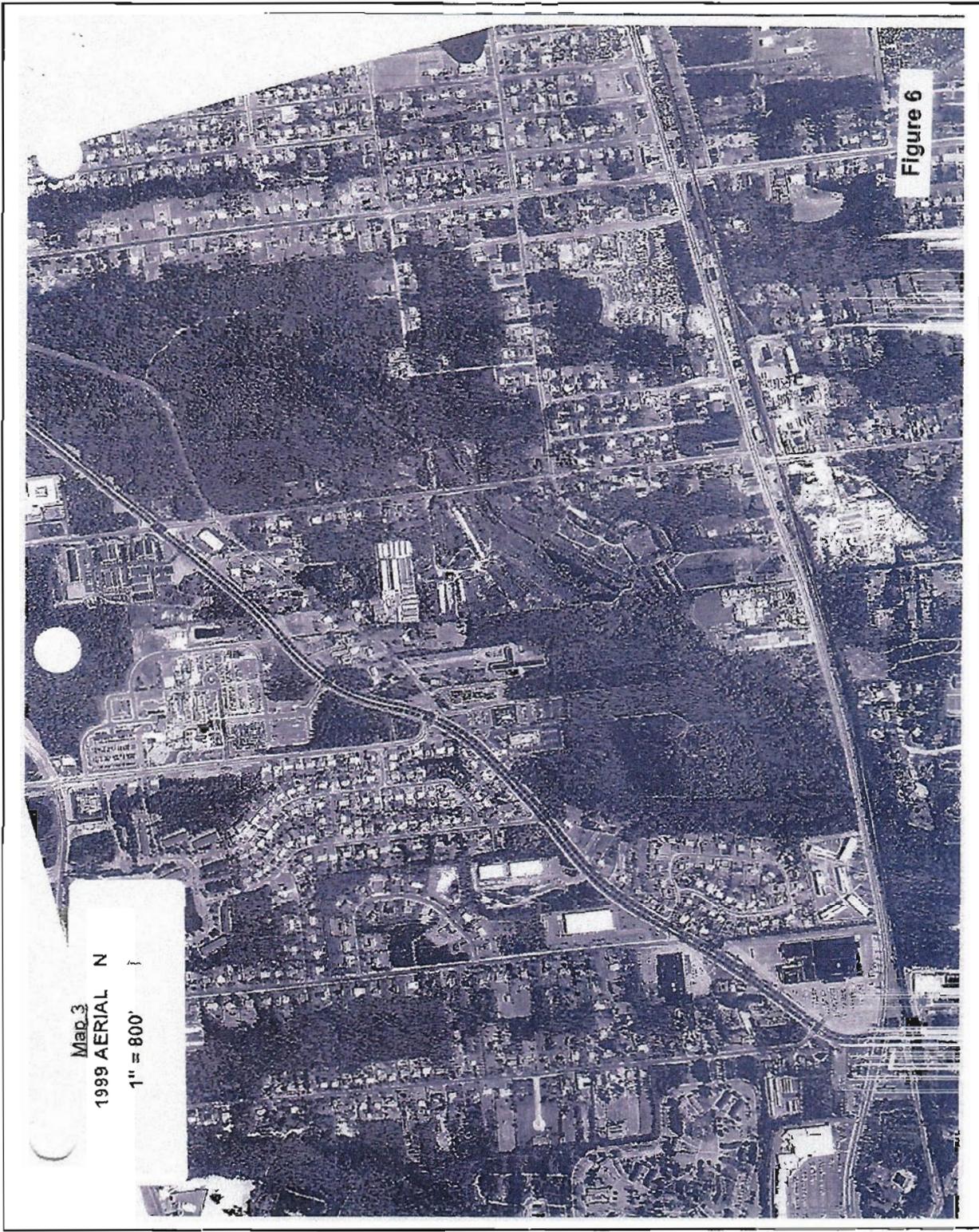




Map 2  
1966 AERIAL N  
1" = 800' T

Figure 5





Map 3  
1999 AERIAL N  
1" = 800'

Figure 6



**Recent History:**

The duck farm property was acquired by Suffolk County through the County tax lien procedures and transferred to the Suffolk County Department of Parks, Recreation and Conservation in 2001. The local sponsor, Suffolk County, has the objectives of restoration of the environmental quality of the site and to utilize the site as a passive recreation area. The County and other public entities have ownership of additional properties in the Mud Creek Watershed, and the County has proposed the acquisition of several other properties to conserve the land area of both the East and West Branch of Mud Creek and its source wetland areas. The goal for acquisition is to create a contiguous undeveloped area of publicly owned land along Mud Creek and its watershed from its headwaters to Robinson Pond. Refer to Figure 7.

**Project Sponsorship:**

Suffolk County initiated the joint-partnership Section 206 aquatic ecosystem restoration project for Mud Creek with the Corps through a letter of interest dated June 12, 2001. The County agreed to act as the non-federal cost-share sponsor in a letter supporting the Preliminary Restoration Plan dated July 29, 2002. Although the Preliminary Restoration Phase was fully funded with federal dollars (\$10,000), all subsequent project phases including the planning feasibility phase, plans and specifications, and the construction and monitoring phases will be cost-shared 65% federal and 35% non-federal. The County would assume all operations and maintenance costs upon project construction. The Suffolk County Department of Planning has been an active sponsor for the project, providing background documentation on the history and environmental characteristics of the restoration site, mapping of the restoration site location, and through participation in meetings with the District and other agencies. The Suffolk County Soil and Water Conservation District Manager and Planning Department have been instrumental in obtaining old records on the operations of the former Gallo Duck Farm. Some of the existing information that has been obtained includes:

- Soil and Water Conservation Plan for the Gallo Duck Farm
- Historic Aerial Photographs
- *Nassau-Suffolk 208 Domestic and Industrial Point Source Inventory and Evaluation*, June 1976 - provides the historic flow and biological oxygen demand levels for several duck farms on Long Island
- 1996 New York State Department of Environmental Conservation (NYSDEC) *Priority Waterbodies List for The Atlantic Ocean/Long Island Sound Basin* – Mud Creek listed as having threatened shellfishing and threatened fish survival with pathogen, nutrient and silt pollutants contributed by an urban runoff source. Special note was made of the brook trout population and a need for more documentation.
- Suffolk County Department of Health Services water quality data from 1968 through 1973 for a sample point north of Montauk Highway. Water quality data from 1997 through 2001 for a sample point taken at the outlet of Robinson Pond.
- U.S. Geological Survey (USGS) water resources discharge data for 1997 (2.8 cubic feet/second at Robinson Pond culvert).
- NYSDEC *Mud Creek Brook Trout Report* – Greg Kozlowski, July 3, 2001
- NYSDEC plan sheet for fish ladder proposed for outlet of Robinson Pond.



# Mud Creek Watershed East Patchogue, Town of Brookhaven Suffolk County



- NYS Freshwater Wetlands
- Proposed Acquisitions
- Town of Brookhaven
- Suffolk County
- SCRPTM Base Tbr02\_83.shp



© 2001 Aerial Photography New York State Office 1000000000

Date of aerial photography: April 2001

3000

0

3000 Feet

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Real Property Taxmap parcel information used with permission of Suffolk County Real Property Tax Service Agency (R.P.T.S.A.). This rendering is a DRAFT MAP in that it is the data step (step 1) in an iterative, or iterative, work product for the purpose of identifying and correcting data. It is not a final agency determination. It is not statistical or factual compilation of data. In some cases correct data has been left out and questionable or inaccurate data has been exaggerated to help identify errors. In short this is a DRAFT MAP produced in an effort to aid in the correction of data and is not held out as being complete or accurate in any way.

\*excerpted from (P.O.L.L.) the provisions of the Freedom of Information Law (Public Officers Law Article 6 Sections 84-89) by section 87.2(g)

**Project Objectives:**

As stated previously, the primary goal of the Section 206 project is to improve the environmental quality of the Mud Creek Watershed through restoration of degraded ecosystem features. The primary focus will be restoration of fish and wildlife habitat within the riparian corridor of the East Branch of Mud Creek. In support of the primary goal, several preliminary objectives have been formulated:

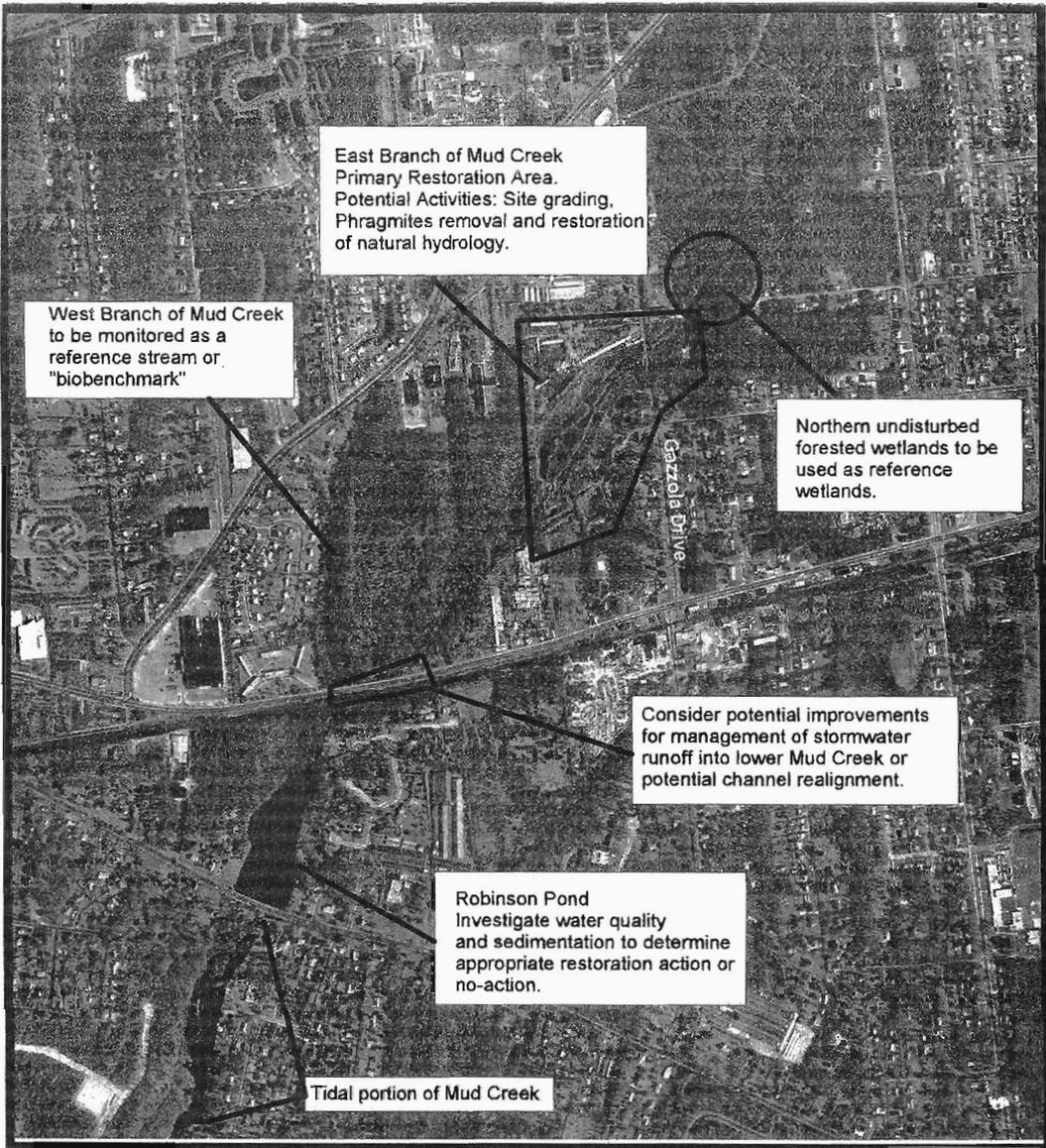
1. Restore natural stream channel geomorphology (form) and hydrologic connection of East Branch of Mud Creek and in turn restore aquatic habitat (brook trout).
2. Restore forested riparian habitat along East Branch of Mud Creek to mimic West Branch.
3. Increase biodiversity within the watershed (increase variety of plant material and in turn fish and wildlife usage). Reduction of monoculture of common reed (*Phragmites*) that currently dominates existing wetland areas along the East Branch of Mud Creek.
4. Promote improved water quality – explore runoff management along Montauk Highway, along Gazzola Drive, and at the headwaters of the West Branch.
5. Enhance habitat of Robinson Pond – consider fish ladder proposal and potential bottom sediment enhancement.
6. Enhance biodiversity and habitat of surrounding upland areas (native grassland restoration or forested floodplain).
7. Develop a master plan to cover conservation of habitat and protection of special-status species, as well as development of passive recreational features in the landscape (i.e. trails, signage, benches, site access).
8. Increase public awareness of watershed importance and the historical and cultural significance of the former duck farm property.

**Proposed Project Design and Alternatives:**

The proposed project could involve site grading activities, restoration of hydrological connections, placement of clean fill or removal of fill material, removal of invasive plant material, removal of pipes and other farm structures, and planting of vegetation to restore wetland, aquatic and upland habitat in the targeted area. The project could restore up to 1,870 linear feet of the East Branch of Mud Creek, up to  $\pm 7$  acres of wetlands, up to  $\pm 10$  acres of upland habitat on the former duck farm property. A minimum of two conceptual alternative plans will be considered for development of an optimal restoration plan for the site. Describe on Pages 12-13 are two preliminary conceptual alternatives for the area West of Gazzola Drive and the area East of Gazzola Drive (Figure 8 and Site Photos).

The Section 206 restoration project is not single species focused, however, the brook trout will serve as an indicator species. Achieving restoration of stream habitat that supports the brook trout will also support the other riparian habitat restoration objectives of the project. To restore brook trout habitat several variables will be important: instream cover and water temperature (achievable through forested floodplain restoration), water velocity and adequate dissolved oxygen levels (achievable through restoration of hydrologic connection and restoration of channel geomorphology), substrate size and pool & riffle size (achievable through restoration of channel geomorphology).





NYS DEC DOQ  
Source Image 1994

300 0 300 600 Feet



**Overview of Mud Creek Watershed  
Restoration Areas and Reference Wetlands/Biobenchmarks**

**Figure 8**

## **Proposed Project Design and Alternatives continued:**

### East of Gazzola Drive:

The area east of Gazzola Drive is currently dominated by *Phragmites*. The concrete flumes are also still present on site.

### *Alternative 1E: Stream Channel Restoration and Phragmites Removal:*

This alternative would involve the phased application of herbicide to remove *Phragmites*. The concrete flumes would be removed, and the site and the main stream channel would be contoured and replanted with wetland herbaceous plants, trees and shrubs.

### *Alternative 2E: Forested Wetland Restoration:*

This alternative would focus on recreating a forested wetland condition by removing fill material from the area and by lowering the ground elevation of the site to support a saturated wetland condition. *Phragmites* would be removed through the phased application of herbicide. The increased soil saturation and the creation of ponded areas would be useful in preventing the return of the invasive plant species. The area would be contoured with hummocks and other microtopographical features. Wetland herbaceous plants, trees and shrubs would be planted. The concrete flumes would be removed from the site in the process of site grading.

### West of Gazzola Drive:

The area west of Gazzola Drive is comprised of the central stream channel that is vegetated by *Phragmites* and some mature trees and shrubs. The upland portion of the site, adjacent to the stream and in the dry lagoon and settling pit areas, is vegetated mainly by successional young red cedar trees and weedy meadow species such as mugwort. The former swimwater areas are dominated by *Phragmites*, and are acting as stagnant ponds due to the lack of hydrologic connection with the stream channel.

### *Alternative 1W: Stream Channel Restoration*

This alternative would be focused on the restoration of the East Branch of Mud Creek to a condition similar to the high quality habitat of the West Branch of Mud Creek. This restoration alternative would involve *Phragmites* removal through the phased application of herbicide, site re-grading, return of the East Branch stream to a natural stream-bed in areas that the stream is currently piped, re-contouring of the stream bed and tree and shrub riparian plantings to promote a habitat type similar to the West Branch of Mud Creek. The swim water areas, that currently support stagnant ponds, would be re-graded to support emergent or forested wetland habitat. One of the main success objectives for this alternative would be to create suitable habitat for brook trout in the East Branch. The dry settling pits and lagoon could be utilized as fill placement areas. Once filled, these areas and surrounding areas could be seeded with native warm season grass and perennial wildflower species or planted with trees. Potentially the lagoon area could be planted as a butterfly garden for added interest to the future passive recreation park. The Suffolk County Parks Department could consider planting annual native wildflowers to enhance the area for aesthetics and butterfly and bird species attraction.



### *Alternative 2W: Pond Restoration*

This alternative would be focused on utilizing existing topography to create a pond area for waterfowl and amphibian habitat. This restoration alternative would involve *Phragmites* removal through the phased application of herbicide, and site re-contouring to expand upon the existing ponds on site in the former swimwater areas to support a shallow depth pond area for waterfowl habitat. The existing East Branch stream would be directed to provide water flow input and serve as an output channel to this ponded area. Similar to Alternative 1W above, the dry settling pits and lagoon could be utilized as fill placement areas. Once filled, these areas and surrounding areas could be seeded with native grass or perennial wildflower species or planted with other woody species. Potentially the filled lagoon area could be planted as a butterfly garden for added interest to the future passive recreation park.

Both of the alternatives for the restoration area west of Gazzola Drive would include removal of old pipe, concrete culvert and selected farm structures.

### Robinson Pond:

The sediments and water quality of Robinson Pond will be investigated to determine if this resource area is still impaired by waste solids that may have settled out during the period of farm operation. Potential plans could include either a no-action plan or potential dredging of the pond to remove heavy nutrient laden sediments.

The area of the confluence of the East and West Branch of Mud Creek, due north of Montauk Highway, will also be explored for possible improvements in the management of stormwater runoff in that location. Better management of road runoff could enhance water quality and the aquatic habitat for the brook trout population. There may also be potential for restoration improvements to the stream channel itself, as the East Branch has migrated to the limits of the roadway. Options could be explored regarding redirection of the stream channel away from the roadway, increasing the buffer area between the stream channel and the roadway, or similar to the discussion above, implementing stormwater management options on the roadway to prevent direct runoff into the stream channel.

### **Success criteria:**

Success criteria or performance standards are observable or measurable attributes that can be used to determine if a restoration project meets the objectives intended for the project. Several preliminary success criteria have been formulated for the Mud Creek project and will serve as a basis for monitoring the project site pre and post construction.

1. Achievement of functional channel design of East Branch (flow, depth, width and substrate type).
2. Instream aquatic habitat diversity (increased diversity of invertebrate population and utilization of East Branch by key species: brook trout).
3. Increase in plant diversity in restored floodplain (restoration of forested floodplain) and observance of enhanced wildlife usage within riparian corridor (waterfowl, passerine birds, mammals, amphibians and reptiles).



4. Enhanced habitat conditions (substrate and water quality) and fish usage of Robinson Pond.
5. Plant diversity increase in restored upland grassland community areas.
6. Water quality improvements.
7. Functional and sustainable usage of the area by the public.
8. Public outreach program (community involvement, educational opportunities, booklet).

### **Study Methodologies:**

The considered project area would be studied to determine baseline environmental conditions of the existing upland, wetland and aquatic habitats of the targeted area. Baseline data collection would include aquatic habitat surveys to include fish surveys, invertebrate surveys, and periphyton surveys, and upland and wetland vegetation analysis. Physical parameters such as sediment and soil type, soil contamination and water quality would also be investigated. The biological sampling plan would be coordinated with the State of New York, Department of Environmental Conservation and Suffolk County to achieve adequate data for permit compliance and to complement state stream habitat assessment protocols.

A complete cultural resource assessment would be completed for considered restoration areas to determine potential historic or archaeological resources present on site. This cultural resource assessment would also involve the research of the duck farm industry on Long Island, which will be pertinent to this restoration site and other potential former farm sites being considered by the non-Federal sponsor for acquisition and ecological restoration. The historical information collected could be used to assemble a public outreach document in addition to feasibility study reports. The cultural resource assessment would be coordinated with the New York State Office of Parks Recreation and Historic Preservation.

The following is a summary of the planned field activities:

- Cultural Resources standardized test pits and possibility of test units.
- Review of farm structures for historic significance.
- Site topographic survey to obtain site contours (1-ft contours in target area).
- Stream gage, cross-sections and geotechnical borings to determine channel geomorphology, water velocity and depth and substrate type (West Branch will be monitored as reference and East Branch existing condition will be obtained).
- Soils/sediment analysis and structure review (Determination of any on-site contamination concerns + determine if any duck waste remains).
- Groundwater piezometer monitoring during one growing season in floodplain wetland areas (Four wells to be monitored to establish existing groundwater elevations for use as information in wetland design).
- Water quality monitoring (East and West Branch + Robinson Pond).
- Rapid Stream Assessment – sample stations  
± Five stations along West and East Branches will be surveyed at least once per season for one year (Spring, Summer and Fall). Survey for aquatic invertebrates, fish and water parameters (DO, pH, temp., and turbidity). The location of these



- sample stations will be matched with the sample stations for geotechnical data collection in order to determine substrate type (grain size distribution).
- Vegetation analysis – Wetland delineation (A wetland delineation will be conducted for permit purposes and to determine existing acreage of habitat types. A vegetation analysis would involve plant species identification and percent cover determinations along transects near aquatic habitat sample stations.)
  - Sampling of ponded areas (Ponded areas will be surveyed for existing aquatic invertebrate/amphibian usage to determine existing biological condition.)
  - Wildlife observations (Point count bird survey).

As stated previously, the West Branch of Mud Creek would be monitored as a control for comparison to determine if the East Branch restoration project achieves success criteria. The undisturbed wetlands north of the farm property would also serve as a biobenchmark for comparison to the restored forested wetlands along the East Branch.

**Project Steps:**

A Preliminary Restoration Plan (PRP) was developed for the Section 206 project in 2003. This document’s main purpose was to determine federal interest. A Project Management Plan was also completed in 2003 to supplement the PRP and to outline project feasibility study tasks and costs. The following is a basic schedule of steps required to implement the Section 206 Project. The schedule is contingent upon funding availability.

Preliminary Restoration Plan	Completed in 2003
Project Management Plan (PMP)	Completed in 2003
North Atlantic Division Approval of PRP and PMP. Project approval to receive feasibility study funding	Completed in 2003.
Initiate Ecosystem Restoration Report Study	January 2004
Completion of Scoping Documents and Meetings	April 2004
Cultural Resources Coordination	April 2004 – October 2004
Field Data Collection Initiation	April 2004
Potential Second Round Soil Testing	October 2004
Completion of Cultural Resources Report	November 2004
Formulation of Alternatives	November 2004
Completion of Environmental Resource Inventory Report	February 2005
Fish and Wildlife Coordination	January – April 2005
Draft Ecosystem Restoration Report (ERR)	May 2005
Final ERR/NEPA Documentation	September 2005
Plans and Specifications	November 2005 - April 2006
District Commander and Local Sponsor sign PCA	June 2006
Construction Contract Award	September 2006
Construction	September 2006–December 2007
Monitoring	September 2006 -December 2010

Preliminary costs for the Section 206 project include \$643,300 for the feasibility study, \$100,000 for plans and specifications, and \$1,100,000 for construction (includes \$40,000



for monitoring). The estimate is considered to be a conservative estimate, including factors for contingencies and potential cost escalation. The non-federal cost share for the project would total \$645,200 and the federal cost share would total \$1,198,100. The non-federal share could be comprised of cash or in-kind services during feasibility or construction (including credits for contribution of real estate). The restoration project features will be designed to be self-sustaining. Potential Operations and Maintenance (O&M) costs could include removal of *Phragmites* or other invasive plant species through mechanical means or by spot herbicide treatment to maintain plant diversity. O&M costs could also include maintenance of recreational features considered as part of the project design, such as trails and interpretive signs. The costs and tasks associated with these local responsibilities would be outlined in an O&M plan.

**Supplemental Information:**

The NYSDEC Bureau of Freshwater Fisheries, conducted an electrofishing survey of Mud Creek in June 2001 and prepared a follow-up report dated July 3, 2001 (Kozlowski 2001). The report clearly identified the significance of the Mud Creek Watershed as a stream system supporting a naturally reproducing population of brook trout. The summary report recommended acquisition of lands within the watershed for natural resource preservation and to fulfill goals of the South Shore Estuary Reserve Program. The report also recommended review of stormwater inputs from Montauk Highway into the stream corridor and surrounding wetlands. The 2001 survey was conducted to remove trout for display at the Cold Spring Harbor Fish Hatchery and Aquarium. During the survey, 45 brook trout were caught, ranging from 2.4 and 10 inches in size.

The NYSDEC Bureau of Freshwater Fisheries will most likely play an important role in monitoring the fish population at Mud Creek. Although plans for work-in-kind have not been finalized, Suffolk County, the local sponsor may be able to contribute to construction and participate in monitoring, most likely water quality, as an in-kind service. The U.S. Fish and Wildlife Service has conducted restoration projects at the nearby Wertheim National Wildlife Refuge in Shirley, New York, that will be useful in reviewing to determine best strategies for restoration and lessons learned for projects involving phragmites removal.

Application for future projects: The Suffolk County Department of Planning is currently considering acquisition of properties throughout the county that were formerly used as duck farms. Acquisition of these areas for natural preservation would be valuable in protecting limited open space from development on Long Island. The proposed Mud Creek Watershed Restoration Project could serve as a showcase project for restoration of degraded habitats that are in many cases associated with important aquatic resource areas such as Great South Bay, Peconic Bay and other inland wetland, tidal creek or freshwater stream network. Success of the proposed project could lead to future restoration partnerships.



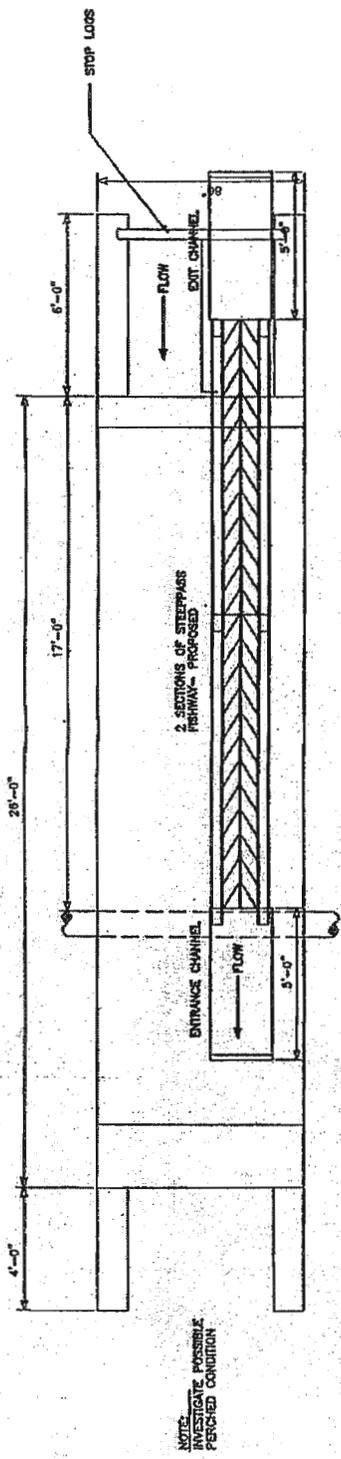
**Scoping Feedback:**

Information is shared with the public and involved resource agencies to receive valuable feedback for development of an optimal final plan for implementation. Your input is important and will shape the quality of the design for the Section 206 restoration project. The following is a list of scoping feedback that would benefit the Corps and the County in formulating alternatives for the project:

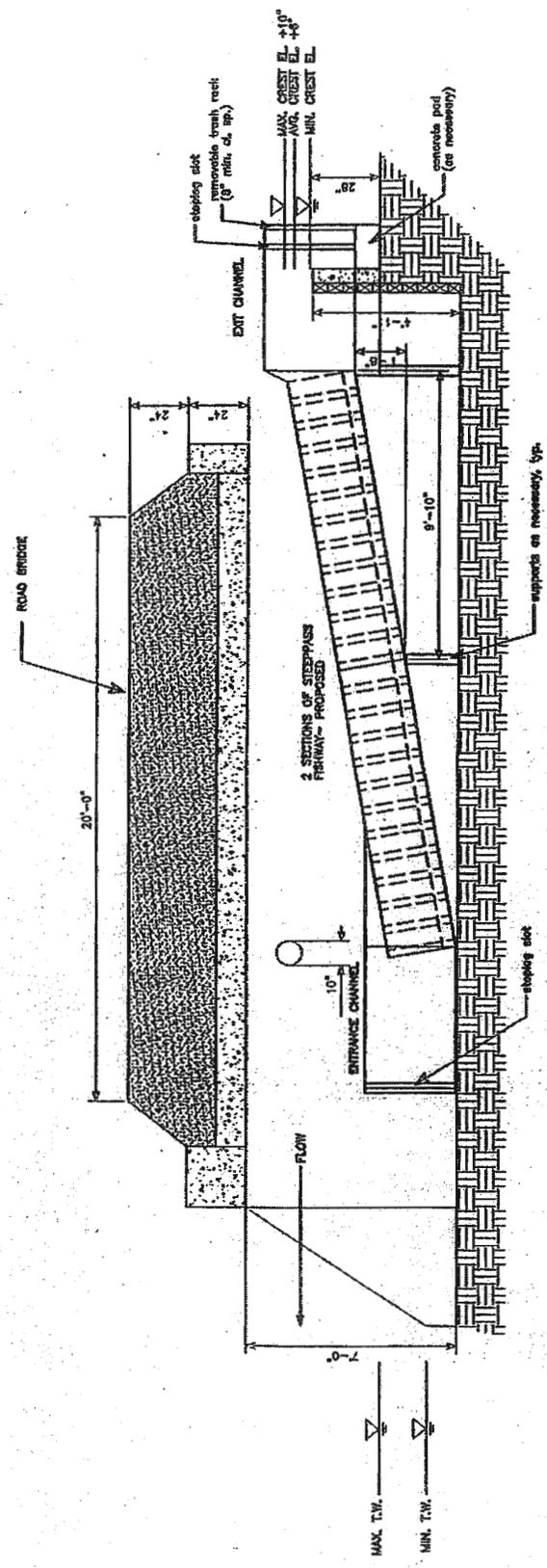
- Site or watershed History (History of Duck Farming Operations, Brook Trout Population, etc.).
- Known similar trout stream restoration projects on Long Island (Sites that could serve as project examples).
- Existing environmental resource inventory data for Mud Creek Watershed (Water quality, biological or physical data)
- Information on State of New York freshwater stream or pond monitoring program & available data relevant to Mud Creek project (water quality data, aquatic invertebrate or fisheries monitoring data).
- Public involvement ideas (Ideas for outreach such as watershed outreach program, high school participation in butterfly garden project or in data collection, presentations at local meetings, etc.)
- Feedback on proposed fish ladder for Robinson Pond (See Figure 9).
- Information on 1985 Heritage Brook Trout Project (Specific interest in obtaining copy of the following report: Perkins, D.L., C.C. Krueger, and B. May. Heritage Brook Trout Project: Summary Report to the New York State Department of Environmental Conservation. Return a Gift to Wildlife Project 29-19-19.
- Ideas for Public Passive Recreational Use of Area (hiking, brook trout population concerns, etc.).
- Volunteer efforts (Interest in and availability to participate with data collection or other efforts).
- Agency input/support of Sample Program (Support of duration and rapid stream assessment method, other ideas for monitoring/environmental assessment, etc.).
- Early feedback on project alternatives (Design recommendations, concerns for use of herbicides, etc.).
- Points of contact (Persons having information on the site history, knowledge of trout, etc.).
- Issues/concerns

Scoping feedback should be sent to: Ms. Megan Grubb  
US Army Corps of Engineers, New York District  
Planning Division  
Attn: Mud Creek Project  
Room 2146, 26 Federal Plaza  
NY, NY 10278-0090  
or  
[Megan.B.Grubb@usace.army.mil](mailto:Megan.B.Grubb@usace.army.mil)  
212-264-0961 (fax) or phone 212-264-5759





PLAN  
SCALE: 1" = 2'-0"



PROFILE  
SCALE: 1" = 2'-0"

NOTES:  
INVESTIGATE POSSIBLE  
PERCHED CONDITION

CONCEPTUAL DESIGN PROPOSED STEPPASS  
FISHWAY ON OUTLET TO LAID CREEK, ROBINSON  
COUNTY, MISSISSIPPI  
COASTAL ECOSYSTEMS PROGRAM OFFICE

NOTES  
SHEET ALLOWED  
DRAWING 4.5 52, 61

PROJECT NO.	DATE	BY	CHKD.	APP'D.
100	10/10/00	JL	ML	ML
PROJECT TITLE: FISHWAY ON LAID CREEK, ROBINSON COUNTY, MISSISSIPPI				
SHEET NO. 1 OF 1				



Figure 9

**References:**

Engineering News-Record. March 28, 1957. The Blue Point Oyster Grows Again. Page 43.

Kozlowski, Gregory. July 31, 2001. Mud Creek Brook Trout. New York State Department of Environmental Conservation, Bureau of Fisheries.

Perkins, D.L., C.C. Krueger, and B. May. 1985. Hertiage Brook Trout Project: Summary Report to the New York State Department of Environmental Conservation. Return a Gift to Wildlife Project 29-19-19.

**Project Mailing List:**

<p><b>Federal Agencies:</b> Stanley W. Gorski National Oceanographic and Atmospheric Administration - Fisheries Habitat and Protected Resources Division Sandy Hook Biological Laboratory 74 Magruder Road Highlands, NJ 07732</p>	<p>Robert Hargrove Strategic Planning and Multimedia Programs Branch U.S. Environmental Protection Agency 290 Broadway New York, NY 10007-1866</p>
<p>Mike Ludwig National Oceanographic and Atmospheric Administration - Fisheries 212 Rodgers Avenue Milford, CT 06460-6499</p>	<p>Mark Maghini U.S. Fish and Wildlife Service PO Box 21 Shirley, NY 11967</p>
<p>Patricia Martinkovic U.S. Fish and Wildlife Service PO Box 21 Shirley, NY 11967</p>	<p>Grace Musumeci Environmental Review Section Environmental Protection Agency 290 Broadway New York, NY 10007-1866</p>
<p>Natural Resources Conservation Service Riverhead Service Center 423 Griffing Avenue Riverhead, NY 11901-3011</p>	<p>Steve Papa U.S. Fish and Wildlife Service Long Island Field Office 500 St. Marks Lane Islip, NY 11751</p>
<p><b>State Agencies:</b> Randy A. Daniels New York State Secretary of State Council Chair, South Shore Estuary Reserve Council 300 Woodcleft Avenue Freeport, NY 11520</p>	<p>Gary Gentile Regional Cultural Resource Coordinator NYS Department of Transportation State Office Building 250 Veterans Memorial Highway Hauppauge, NY 11788-5518</p>
<p>Charles Guthrie Regional Fisheries Manager New York State Department of Environmental Conservation Bureau of Freshwater Fisheries SUNY-Building 40 Stony Brook, NY 11790-2356</p>	<p>Chuck Hamilton Regional Natural Resources Supervisor New York State Department of Environmental Conservation SUNY-Building 40 Stony Brook, NY 11790-2356</p>
<p>Greg Kozlowski Regional Habitat Manager New York State Department of Environmental</p>	<p>Robert D. Kuhn NYS Office of Parks, Recreation and Historic Preservation</p>



<p>Conservation Bureau of Habitat SUNY-Building 40 Stony Brook, NY 11790-2356</p>	<p>Historic Preservation Field Service Bureau Peebles, Island, P.O. Box 189 Waterford, NY 12188-0189</p>
<p>Douglas Mackey NYS Office of Parks, Recreation and Historic Preservation Historic Preservation Field Service Bureau Peebles, Island, P.O. Box 189 Waterford, NY 12188-0189</p>	<p>Richard Martin, Director Division of Cultural and Historic Services Suffolk County Parks Department P.O. Box 144 West Sayville, NY 11796</p>
<p>Dennis Mildner New York State Department of State Division of Coastal Resources 41 State Street Albany, NY 12231-0001</p>	<p>Brian D. Murphy Senior Fisheries Habitat Biologist CT DEP Eastern Division Inland Fisheries Division Habitat Conservation and Enhancement program 209 Hebron Road (Rt. 66) Marlborough, CT 06447</p>
<p>John Pavacic Regional Permit Administrator New York State Department of Environmental Conservation SUNY-Building 40 Stony Brook, NY 11790-2356</p>	<p>Dan Rosenblatt Regional Wildlife Manager New York State Department of Environmental Conservation SUNY-Building 40 Stony Brook, NY 11790-2356</p>
<p>Peter Scully Regional Director New York State Department of Environmental Conservation SUNY-Building 40 Stony Brook, NY 11790-2356</p>	
<p><b>Elected Officials:</b> Representative Timothy Bishop New York-1<sup>st</sup> 1133 Longworth HOB Washington, DC 20515-3201</p>	<p>Assemblywoman Patricia Eddington 3<sup>rd</sup> Assembly District District Office 38 Oak Street, Suite 5 Patchogue, NY 11772</p>
<p>Honorable Brian Foley Suffolk County Legislator Seventh Legislative District 90 W. Main Street, Suite 2N Patchogue, NY 11722</p>	<p>John Jay LaValle Supervisor Town of Brookhaven 3233 Route 112, Building 5 Medford, NY 11763</p>
<p>Steve Levy Suffolk County Executive P.O. Box 6100 Hauppauge, NY 11788-0099</p>	<p>Senator Caesar Trunzo 3<sup>rd</sup> District 711 Legislative Office Building Albany, NY 12247</p>
<p><b>County Offices:</b> Charles Bartha Commissioner, Suffolk County Department of Public Works 335 Yaphank Avenue Yaphank, NY 11980</p>	<p>Laura Bavaro Suffolk County Health Services Office of Ecology Griffing - County Centre Riverhead, NY 11901</p>
<p>William J. Colavito Suffolk County Department of Public Works 335 Yaphank Avenue Yaphank, NY 11980</p>	<p>DeWitt Davies Chief Environmental Analyst Suffolk County Planning Department PO Box 6100 Hauppauge, NY 11788-0099</p>



<p>Michael J. Deering  Director of Environmental Affairs  Suffolk County Executive Office  P.O. Box 6100  Hauppauge, NY 11788-0099</p>	<p>Debbie Epple  Director of Public Information  Suffolk County Office of Public Information  Building 158 – North County Complex  PO Box 6100  Hauppauge, NY 11788-0099</p>
<p>Lauretta Fischer  Suffolk County Planning Department  PO Box 6100  Hauppauge, NY 11788-0099</p>	<p>Nick Gibbons  Suffolk County Department of Parks, Recreation  and Conservation  PO Box 144  Montauk Highway  West Sayville, NY 11796-0144</p>
<p>Ronald Foley  Suffolk County Department of Parks, Recreation  and Conservation  PO Box 144  Montauk Highway  West Sayville, NY 11796-0144</p>	<p>Thomas Isles, AICP  Director  Suffolk County Planning Department  PO Box 6100  Hauppauge, NY 11788-0099</p>
<p>Tom Iwanejko  Suffolk County Department of Mosquito Control  335 Yaphank Avenue  Yaphank, NY 11980</p>	<p>Richard J. LaValle, P.E.  Chief Deputy Commissioner  Public Works – Highway Division  335 Yaphank Avenue  Yaphank, NY 11980</p>
<p>Alexander G. McKay  Chairman  Suffolk County Board of Trustees  Suffolk County Department of Parks, Recreation  and Conservation  PO Box 144  Montauk Highway  West Sayville, NY 11796-0144</p>	<p>Thomas J. McMahon  District Manager, Soil and Water Conservation  District  423 Griffing Avenue  Riverhead, NY 11901</p>
<p>Vito Minei  Director, Division of Environmental Quality  Suffolk County Department of Health Services  220 Rabro Drive  Hauppauge, NY 11788</p>	<p>Dale D. Moyer  Program Director - Agriculture  Suffolk County Cooperative Extension  423 Griffing Avenue  Suite 100  Riverhead, NY 11901</p>
<p>Chris Pickerell  Ecological and Restoration Specialist  Suffolk County Cooperative Extension  Suffolk County Marine Environmental Learning  Center  3690 Cedar Beach Road  Southold, NY 11971</p>	<p>Tracey Scala  Deputy Commissioner  PO Box 144  Montauk Highway  West Sayville, NY 11796</p>
<p>Martin Trent, P.E.  Acting Chief, Office of Ecology  Suffolk County Dept. of Health Services  Riverhead County Center  Riverhead, NY 11901-3397</p>	<p>Mary Lou Varney  Suffolk County Department of Parks, Recreation  and Conservation  PO Box 144  Montauk Highway  West Sayville, NY 11796-0144</p>
<p>Ron Verbarg  Suffolk County Planning Department  PO Box 6100  Hauppauge, NY 11788-0099</p>	<p>Thomas B. Williams  Executive Director  Suffolk County Cooperative Extension  423 Griffing Avenue, Suite 100  Riverhead, NY 11901</p>



<p><b>Local Government</b>  <b>Robert Chartuk</b>  Commissioner of Parks, Recreation, Sports and Cultural Resources  Town of Brookhaven  1130 Old Town Road  Coram, NY 11727</p>	<p><b>Daniel Gulizio</b>  Commissioner of Planning, Environment and Development  Town of Brookhaven  One Independence Hill  Farmingville, NY 11738</p>
<p><b>Jeffrey Kassner</b>  Director, Division of Environmental Protection  Town of Brookhaven  One Independence Hill  Farmingville, NY 11738</p>	<p><b>Timothy P. Mazzei</b>  Councilman, District 5  One Independence Hill  Farmingville, NY 11738</p>
<p><b>David Overton</b>  Town Historian  Brookhaven Town Hall  205 S. Ocean Avenue  Patchogue, NY 11772</p>	
<p><b>Other</b>  <b>Susan Antenen</b>  The Nature Conservancy  250 Lawrence Hill Road  Cold Spring Harbor, NY 11724</p>	<p>Citizens Environmental Research Institute  225 Main Street, Suite 2  Farmingdale, NY 11735</p>
<p><b>George Costa and Ivan Frank</b>  Art Flick Trout Unlimited Chapter 425  35 Biltmore Drive  Mastic Beach, NY 11951</p>	<p><b>Jack Finkenberg</b>  President, Great South Bay Audobon Society  PO Box 267  Sayville, NY 11782</p>
<p><b>Jeffrey Fullmer</b>  Director  South Shore Estuary Reserve  300 Woodcleft Avenue  Freeport, NY 11520</p>	<p><b>Joseph Janssen</b>  The Nature Conservancy  250 Lawrence Hill Road  Cold Spring Harbor, NY 11724</p>
<p><b>Craig Kessler</b>  Ducks Unlimited  10 Hastings Drive  Stony Brook, NY 11790</p>	<p><b>Dr. Michael LaFever</b>  District Superintendent  South Country Central School District  189 North Dunton Ave.  East Patchogue, NY 11772</p>
<p><b>Eric Newman</b>  President, New York City Trout Unlimited 447  401 East 81st St, #12-k  New York NY 10028-5824</p>	<p><b>Cindy Patterson</b>  Ducks Unlimited  7 Clover Lane  Brookhaven, NY 11719</p>
<p><b>Jeffrey Plackis</b>  President, Long Island Trout Unlimited 069  &amp; Long Island Brook Trout Coalition  49 Lakeside Drive  Rockville Centre NY 11570-2309</p>	<p><b>John Sauer</b>  Chair, Long Island Sierra Club  305 Hillside Avenue  Bellmore, NY 11710</p>
<p><b>Alan Svoboda</b>  Land Use Specialist  South Shore Estuary Reserve  300 Woodcleft Avenue  Freeport, NY 11520</p>	<p><b>Dave Thompson</b>  Art Flick Trout Unlimited Chapter 425  43 Birch Hill Road  Mount Sinai, NY 11766</p>





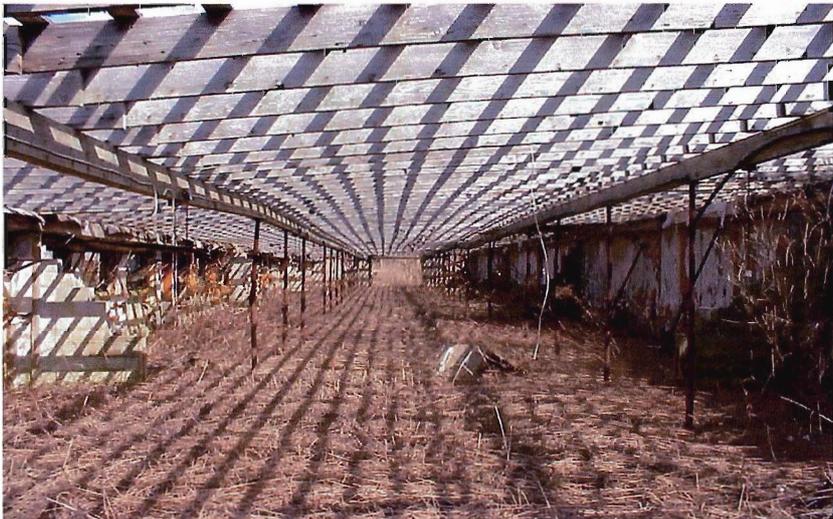
Panoramic view of abandoned duck farm.



Stagnant water portion of Mud Creek at abandoned duck farm.



Dilapidated farm buildings on former duck farm west of Gazzola Drive.



Abandoned farm building on former duck farm east of Gazzola Drive.



Looking north on Gazzola Drive where former duck farm and Mud Creek straddle road.



Pond on west side of abandoned duck farm.



Former duck farm waste disposal lagoon.



Former duck farm waste disposal lagoon.



Undisturbed portion of Mud Creek between former duck farm and Montauk Highway.



Mud Creek looking south to Great South Bay from South Country Road.