MILL BROOK WATERSHED PLAN

CHENANGO COUNTY, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL CONSERVATION SERVICE

ADDENDUM

MILL BROOK WATERSHED

Chenango County, New York

INTRODUCTION

This addendum was developed in accordance with phase-in procedures adopted by the Water Resources Council for implementation of the Principles and Standards for Level C Plans. Field studies analyses, and evaluations were completed as of October 25, 1973, and have been formulated in accordance with Senate Document 97, as supplemented and amended. These plans are to be transmitted to the Office of Management and Budget before June 30, 1976.

DISCOUNT RATE COMPARISON

This plan was formulated before October 25, 1973, following the general guidance outlined in Senate Document 97. However, in evaluations, an interest rate of 6 7/8 percent, as outlined in the Principles and Standards, was used. Installation costs are based upon prices being experienced in 1974. Benefits and operation and maintenance costs are based upon adjusted normalized prices. Average annual costs are $131,400, average annual benefits, including secondary, are $165,700, and the benefit cost ratio is 1.3:1.0. The B:C ratio, excluding secondary benefits of $15,100, is 1.2:1.0.

Using an interest rate of 6 1/8 percent, 1974 prices for installation costs, and adjusted normalized prices for benefits and operation and maintenance costs, average annual costs are $119,100, average annual primary and secondary benefits are $165,700, and the B:C ratio is 1.4:1.0. The exclusion of $15,100 in secondary benefits provides a B:C ratio of 1.3:1.0.

ABBREVIATED ENVIRONMENTAL QUALITY PLAN

ENVIRONMENTAL CONCERNS

The major environmental concerns in this watershed are:

1. The natural beauty
2. The quality of water, land, and air resources
3. Biological resources and ecological systems
4. Geological, archeological, and historical resources

There are about 36 acres of capability class VIIs pastureland that should have an adjustment in land use due to steepness of slopes and rocky conditions. These conditions limit use of modern farm equipment in reestablishment of vegetation and application of management practices.

Erosion, which is the wearing away of land surface by running water, wind, ice, or other geological agents, is present throughout the watershed. Erosion occurs in the upland areas as a result of poor management, steep topography, cultural operations, and erosive soils. Erosion in the flat sections of the watershed is occurring, but at a very low rate.

Sheet erosion is the removal of a fairly uniform layer of soil from the land surface by runoff water. Sheet erosion rates by land use are shown in Table 1.

TABLE 1 - SHEET EROSION BY LAND USE

Land Use	Sheet Erosion Rates (tons/acre/year)
Cropland	.40 - .70
Pastureland	.40 - .60
Forest Land	.03 - .07
Other 1/	.90

1/ Includes roads, farmsteads, urban and built-up areas

The gravel pit near the extreme western edge of the watershed is the only identified upland sediment source. Sediment delivered to the

stream from this source has been calculated at approximately 20 tons per year.

Streambank erosion is occurring along approximately 850 feet of the channel downstream from the culvert on Main Street. The streambanks generally consist of loose, gravelly soil with little to no vegetative cover. Estimated sediment contributed to the stream from this source is 30 tons per year.

Average annual sediment discharge at the mouth of the watershed is approximately 390 tons per year. This is equivalent to a sediment concentration of 57.1 milligrams per liter. The turbidity of a water quality sample collected July 30, 1973 was 0.9 Jackson Turbidity Units or approximately 0.9 milligrams per liter.

Wildlife species have diverse requirements and occupy a vast variety of niches in the ecosystem. However, species may be generally grouped by main habitat into forest wildlife, open land or agricultural wildlife, and wetland wildlife.

Forest wildlife species are those which find both food and cover within the forest, although they may venture into open land to feed. Factors affecting the density of these species may include size of woodlot, density of human population, and composition of vegetation by type and successional stage. These factors, in conjunction with climatic conditions, determine species range. The woodlots of the watershed provide good habitat for game and furbearing species typical of cutover hardwoods in New York (Table 2, Species and Density).

TABLE 2 - ESTIMATED DENSITIES OF GAME AND FURBEARING SPECIES

Species of the Watershed	Density
Forest Wildlife	
Whitetail Deer	Good (3-4 per 100 acres)
Ruffed Grouse	Good (1 per 10-15 acres)
Gray Squirrels	Good (1 per 2 acres)
Open Land Wildlife	
Cottontail Rabbit	Good (2-3 per 10 acres)
Raccoon	Moderate (1 per 20-25 acres)
Skunk	Unknown
Opossum	Unknown
Ringneck Pheasant	Very low (less than 1 per 100 acres)
Wetland Wildlife	
Waterfowl	Migrant - very low nesting (2 per 10 acres)
Woodcock	Migrant - very low nesting (2-3 per 100 acres)
Muskrat	Unknown
Mink	Unknown

Open land or agricultural wildlife species commonly find food in open fields, close to woody vegetation (hedgerows, forest edges, etc.) which provides escape and winter cover. The type of agriculture and management practices are important factors determining habitat suitability.

Early mowing, fall plowing, decreasing grain production, and the elimination of hedgerows are some practices detrimental to open land wildlife. Agricultural land management limits populations of species such as the ringneck pheasant, which depend on high grain production for high densities.

Species commonly associated with water are known as wetland wildlife (waterfowl), shorebirds, and furbearers. The density of these species is determined by the abundance of open surface water and variety of aquatic vegetation. The limited surface water resources and wetlands of the watershed have created a wetland wildlife community comprised primarily of mammals. Woodcock and migratory waterfowl pass through

the area, but little nesting is found. Many amphibians and reptiles are found throughout the habitat.

Surface water resources provide very little public sport fishing. A cold water trout fishery exists in the northern tributary, primarily above Sherburne Turnpike (1.5 miles). A July 1958 shocking of the reach (New York State Department of Environmental Conservation) produced wild brook trout ranging from 2 1/2 to 9 inches in length. Competitive species included creek chubs and blacknose dace. Although maintained by natural reproduction, fish of harvestable size are limited due to lack of pools and low base flow.

Trout rarely occur in the southern tributary. The New York State Department of Environmental Conservation Survey of 1958 produced only two brook trout. Suckers and blacknose dace are common. Trout which occur in this reach are limited to small, spring-fed pools because of low flows and lack of shade.

The small impoundments of the watershed support bass and bluegill fisheries which are limited to private use.

Hunting opportunities in the watershed are few. Much of the land where game species occur is posted and hunter-use is limited to landowners and their friends. Most of the hunting occurs on state game lands in surrounding counties, especially during deer season.

The topography of Chenango County is a panorama of rolling hills and valleys. Perhaps the most pronounced scenic asset is the broad Unadilla Valley. The western half of the county is dotted with numerous small ponds and lakes which are scenic assets.

The Office of New York State Parks and Recreation identified three historic places in the village of New Berlin. These places are Preferred Manor, a building nominated to the National Register of Historic Places; the New Berlin Library (located in flood prone area); and Upjohn's St. Andrews Church.

A New York State Museum and Science Service literature review revealed no archeological sites in the vicinity of planned structural measures. As there is a significant hilltop site (Indian activity) identified in the general area, the Museum and Science Service recommended that an archeological survey be conducted at the proposed structural sites. An archeological survey is scheduled to be completed during the summer of 1974 by a Kirkland College anthropologist.

OBJECTIVES

The objectives of the sponsors are: to preserve areas of natural beauty; maintain or enhance the quality of water, land, and air resources; improve and maintain biological resources and ecological systems; and to prevent destruction or loss of geological, archeological, and historical resources.

COORDINATION AND FORMULATION

The sponsors, interested local groups, state agencies, Environmental Protection Agency, and U.S. Fish and Wildlife Service have been involved in planning efforts regarding environmental aspects of the project.

THE ABBREVIATED ENVIRONMENTAL QUALITY PLAN

The environmental quality plan consists of conservation land treatment.

The land treatment phase of the plan includes technical assistance and measure installation and applies to each acre in the watershed. The land treatment phase includes continuation of the ongoing technical assistance and measure installation at a rate in existence prior to the formulation of this plan and accelerated technical assistance and measure installation required to meet project objectives. Technical assistance, going and accelerated, will be used to review, revise, and update existing conservation and woodland plans, to develop new plans where needed, for soil surveys, resource inventories and for installation of measures. Technical assistance will thus be applicable to any acre in the watershed. Measure installation will be on those acres which require treatment for adequate protection and for changes in use.

Through consensus of the conservation district, community leaders, landowners, and state and federal agencies, it was agreed that adequate land treatment should be applied to 250 acres of cropland, 300 acres of pastureland, 323 acres of forest land, and 50 acres of urban and other land during the 5-year installation period. Table 3 indicates planned types of land treatment measures to be applied.

TABLE 3 - LAND TREATMENT INSTALLATION

Land Use	Acres Needing Treatment	Land Treatment to be Applied 1/
Cropland	250	Conservation cropping system Contour Farming Diversion Pasture and Hayland Management Pasture and Hayland Planting Stripcropping Subsurface Drain
Pastureland	300	Brush Management Pasture and Hayland Management Pasture and Hayland Planting Pond Proper Grazing Use Trough or Tank
Forest Land	323	Hydrologic Cultural Operations Tree Planting Woodland Grazing Control Forest Management
Other	50	Fishpond Management Hedgerow Planting Pond Wildlife Wetland Habitat Management Wildlife Upland Habitat Management

1/ Definitions of land treatment measures in Appendix B.

Wildlife habitat management practices will be interspersed throughout the watershed. These practices will include planting grasses, legumes, and shrubs, constructing watering facilities, and managing valuable wildlife food plants.

The estimated cost for application of the land treatment phase would be about $26,000. Technical assistance costs for the land treatment phase would be about $12,800.

IMPLEMENTATION

The proposed Environmental Quality Plan could be implemented through PL-566 administered by the Soil Conservation Service. Authorities provided through this act could be used to supplement authorities of the county, state and federal agencies.

The land treatment phase could be implemented through the Chenango County Soil and Water Conservation District. Technical assistance could be provided by local, state and federal agencies through their going programs in accordance with their authorities and responsibilities. PL-566 funds might be used by the Soil Conservation Service and the Forest Service to provide accelerated technical assistance. The landowners and operators would finance the cost of installing measures on their land utilizing their usual source of funds with cost sharing assistance available through going conservation programs.

EFFECTS AND IMPACTS

The combined effects of the abbreviated Environmental Quality Plan, as compared to conditions that might exist without a plan or with other plans, would be to preserve areas of natural beauty; avoid disturbances of archeological and paleontological material; improve the quality of water, land, and air resources; and maintain and improve biological resources and ecological systems. The plan will not increase base flow. Thus, the existing fishery will not be affected.

The land treatment program would meet the stated objectives by providing technical assistance to review and make needed revisions of conservation and woodland plans; to maintain existing cover, which is adequate; and to plan and apply land treatment measures applicable to land areas which require treatment.

The land treatment program would apply to all land in the watershed. Conservation measures would be applied on cropland, pastureland, forest land, and urban and other land. This alternative would improve the hydrologic condition of the watershed and reduce runoff from the 100-year frequency storm event by about 3.6 percent. Woodland wildlife habitat would be increased by about 15 acres.

The installation of vegetative and structural types of land treatment measures would effectively reduce runoff, conserve soil moisture, and

reduce losses of topsoil. The amount of sediment leaving the watershed would be reduced by 20 tons annually. This is equivalent to 2.9 mg/l. Land treatment measures would enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

MILL BROOK WATERSHED

DISPLAY ACCOUNTS - SELECTED PLAN

A display of the beneficial and adverse effects are given in the following pages for:

National Economic Development

Environmental Quality

Regional Development

Social Well-being

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SELECTED PLAN

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

Components	Measures of Effects 1/	Components	Measures of Effects
Beneficial effects:		Adverse effects:	
A. The value to users of increased outputs of goods and services		A. The value of resources required for a plan	
1. Flood prevention	$ 61,360	1. Floodwater retarding structure and a multipurpose reservoir, and recreational facilities, and channel work	
2. Recreation (Fish & Wildlife)	89,240	Project Construction	$102,700
3. Land Treatment	860	Project administration	10,900
		O&M 2/	17,800
		2. Land treatment	
		Project construction	774
		O&M	86
Total beneficial effects	$151,460	Total adverse effects	$132,260
		Net beneficial effects	$ 19,200

1/ Average annual values based on 100 years @ 6-7/8 percent interest.
2/ Includes $13,600 for operation, maintenance, and replacement for the fish and wildlife development.

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SELECTED PLAN

ENVIRONMENTAL QUALITY

Components	Measures of Effects
Beneficial and adverse effects:	
A. Areas of natural beauty	1. Construction of structure No. 1 will eliminate 5 acres of forest land.
	2. Construction of the multiple-purpose structure will impound 50 surface acres of water and thus provide visual contrast to landscape.
B. Quality considerations of land, water and air	1. Increased traffic in the vicinity of the fish and wildlife development will result in increased pollution (noise, exhaust fumes, litter, etc.).
C. Biological systems and ecological resources	1. The installation of channel work will change 1,318 feet of open modified channel to a reinforced concrete conduit.
	2. Habitat eliminated during construction will displace about 5 rabbits and an unknown number of songbirds.
C. continued	3. Construction of structure No. 1 will increase the stream's present carrying capacity for trout.
	4. Construction of multiple-purpose structure will create a 50 acre lake which will provide habitat for trout, bass, waterfowl, and songbirds.
	5. Land treatment measures will increase woodland wildlife habitat by 15 acres, and reduce sediment leaving the watershed by 20 tons annually.
D. Irreversible and Irretrievable	1. Approximately 4,000 feet of natural stream channel will be altered.

MILL BROOK WATERSHED

SELECTED PLAN

REGIONAL DEVELOPMENT ACCOUNT

Components	Measures of Effects 1/ State of New York	Rest of Nation
Income:		
Beneficial effects:		
A. The value to users of increased output of goods and services		
1. Flood prevention	$61,360	-
2. Recreation (Fish & Wildlife)	89,240	-
3. Land treatment	860	-
B. The value of output to users by region from external economics		
1. Secondary benefits associated with increased agricultural production (processing and storage)	15,100	$-15,100
Total beneficial effects	$166,560	-15,100

Components	Measures of Effects 1/ State of New York	Rest of Nation
Income:		
Adverse effects:		
A. The value of resources contributed from within the region to achieve the outputs.		
1. Floodwater retarding structure and a multiple-purpose reservoir, and recreational facilities, and channel work.		
Project construction	$23,450	$78,150
Project administration	9,300	1,600
O&M	17,800	
2. Land treatment		
Project construction	774	
O&M	86	
Total adverse effects	51,410	79,750
Net beneficial effects	115,150	-94,850

1/ Average annual values based on 100 acres @ 6 7/8 percent interest

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SELECTED PLAN

REGIONAL DEVELOPMENT ACCOUNT

Components	Measures of Effects	
	State of New York	Rest of Nation
Beneficial effects:		
Employment:		
A. Increase in the number and types of jobs		
1. Employment for project O&M	3.5 man-years of semi-skilled employment per year	-
2. Employment induced from fish and wildlife development	1.5 man-years of semi-skilled employment per year	-
Total beneficial effects	5 man-years of permanent semi-skilled employment	
Adverse Effects:		
Population:		
1. Population Distribution	Project will result in the relocation of one family	
Total adverse effects	Relocation of one family	

MILL BROOK WATERSHED

SELECTED PLAN

SOCIAL WELL-BEING

Components	Measures of Effects
Beneficial and adverse effects:	
A. Real income distribution	1. Project will eliminate 51 acres of cropland which produces about $6,350 worth of crops per year.
B. Life, health and safety	1. Reduced flooding will enhance the life style of those living in the watershed.
C. Recreational opportunities	1. Project will provide facilities for fishing, picnicking, field games, hiking, and nature studies. Facilities are designed to handle 440 swimmers and 400 picnickers per day.

PLAN AGREEMENT

between the

CHENANGO COUNTY BOARD OF SUPERVISORS (County)
CHENANGO COUNTY SOIL AND WATER CONSERVATION DISTRICT (District)
VILLAGE OF NEW BERLIN (Village)
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (Department)
of the State of New York

(hereinafter referred to as the Sponsoring Local Organization)

and the

SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE
(hereinafter referred to as the Service)

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsoring Local Organization for assistance in preparing a plan for works of improvement for the Mill Brook Watershed, State of New York, under the authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83d Congress; 68 Stat. 666), as amended; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Service; and

Whereas, there has been developed through the cooperative efforts of the Sponsoring Local Organization and the Service a mutually satisfactory plan for works of improvement for the Mill Brook Watershed, State of New York, hereinafter referred to as the plan, which plan is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing considerations, the Sponsoring Local Organization and the Secretary of Agriculture, through the Service, hereby agree on the plan, and further agree that the works of improvement as set forth in said plan can be installed in about 5 years.

It is mutually agreed that in installing and operating and maintaining the works of improvement substantially in accordance with the terms, conditions, and stipulations provided for in the plan:

1. The Sponsoring Local Organization will acquire such landrights as will be needed in connection with the works of improvement. The percentages of this cost to be borne by the Sponsoring Local Organization and the Service are as follows:

Works of Improvement	Sponsoring Local Organization		Service (percent)	Estimated Land Rights Cost (dollars)
	County and Village (percent)	Department (percent)		
Multiple-Purpose Structure No. 2 and Public Fish and Wildlife and Recreational Development				
Payments to landowners for about 168 acres, appraisal cost, and cost of relocation or modification of improvements	0	50	50	62,100
Legal fees, survey costs and other	0	100	0	6,200
All other structural measures	100	0	0	10,400

The Sponsoring Local Organization agrees that all land acquired or improved with Public Law 566 financial or credit assistance will not be sold or otherwise disposed of for the evaluated life of the project except to a public agency which will continue to maintain and operate the development in accordance with the Operation and Maintenance Act.

2. The Sponsoring Local Organization assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the Sponsoring Local Organization and the Service as follows:

Works of Improvement	Sponsoring Local Organization: County and Village (percent)	Sponsoring Local Organization: Department (percent)	Service (percent)	Estimated Relocation Payment Costs (dollars)
Multiple-Purpose Structure No. 2 and Public Fish and Wildlife and Recreational Development	0	23.6	76.4	6,000
All Other Structural Measures	23.6	0	76.4	0 1/

1/ Investigation has disclosed that under present conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost-shared in accordance with the percentages.

3. The Sponsoring Local Organization will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement.

4. The percentages of construction costs of structural measures to be paid by the Sponsoring Local Organization and by the Service are as follows:

Works of Improvement	Sponsoring Local Organization: County (percent)	Sponsoring Local Organization: Department (percent)	Service (percent)	Estimated Construction Cost (dollars)
Multiple-Purpose Structure No. 2	0	40.1	59.9	517,000
Public Fish and Wildlife and Recreational Development				
Access Roads	30	20	50	29,000
Service Roads	30	20	50	8,000
Guide Post	30	20	50	5,200
Parking Lot (104 cars)	30	20	50	21,900
Signs and Chain Gates for Service Roads	0	50	50	670
Parking Lot Bumper Rails	40	10	50	1,130
Boat Launch Ramp and Turn Around	0	50	50	2,300

Works of Improvement	Sponsoring Local Organization: County (percent)	Sponsoring Local Organization: Department (percent)	Service (percent)	Estimated Construction Cost (dollars)
Pavilion (shelter)	50	0	50	10,000
Bathhouse	40	10	50	27,500
Septic tanks (2,000 gallons)	40	10	50	2,000
Tile Fields (Septic Fields)	50	0	50	3,600
Water Supply (Pump Pressure Tank, Pumphouse, Pipelines and Labor)	40	10	50	11,600
Shade Trees	0	50	50	3,750
Seeding	0	50	50	2,500
Beach (100' x 200')	50	0	50	5,000
Wading Area (50' x 200')	50	0	50	2,500
Picnic Tables	50	0	50	5,000
Charcoal Grills (Cast Iron with Concrete Base)	50	0	50	1,600
Garbage Can Stands (Post in Concrete)	50	0	50	350
Life Guard Tower	50	0	50	300
Float	50	0	50	1,000
Swings, Slides, Ball Field Backstop, Horseshoe Pits	50	0	50	1,500
Screening Hedge	0	50	50	1,000
Foot Trail	0	50	50	1,000
Foot Bridge	0	50	50	2,000
All Other Structural Measures	0	0	100	582,000

5. The percentages of the engineering costs to be borne by the Sponsoring Local Organization and by the Service are as follows:

Works of Improvement	Sponsoring Local Organization: County and Village (percent)	Sponsoring Local Organization: Department (percent)	Service (percent)	Estimated Engineering Cost (dollars)
Public Fish and Wildlife and Recreational Development	40	10	50	24,200
All Other Structural Measures	0	0	100	133,000

6. The Sponsoring Local Organization and the Service will each bear the costs of Project Administration which it incurs, estimated to be $22,900 and $134,900 respectively. The Department will bear $12,400 of the local costs.

7. The Sponsoring Local Organization will obtain agreements from owners of not less than 50 percent of the land above each reservoir and floodwater retarding structure that they will carry out conservation farm or ranch plans on their land.

8. The Sponsoring Local Organization will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the plan.

9. The Sponsoring Local Organization will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.

10. The Sponsoring Local Organization will be responsible for the operation and maintenance of the structural works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.

11. The costs shown in this agreement represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.

12. This agreement is not a fund obligating document. Financial and other assistance to be furnished by the Service in carrying out the plan is contingent on the appropriation of funds for this purpose.

    A separate agreement will be entered into between the Service and the Sponsoring Local Organization before one party initiates work involving funds of the other parties. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

13. The plan may be amended or revised, and this agreement may be modified or terminated, only by mutual agreement to the parties hereto except for cause. The Service may terminate financial and other assistance in whole, or in part, at any time whenever it is determined that the Sponsoring Local Organization has failed to comply with the conditions of this

agreement. The Service shall promptly notify the Sponsoring Local Organization in writing of the determination and the reasons for the termination, together with the effective date. Payments made to the Sponsoring Local Organization or recoveries by the Service under projects terminated for cause shall be in accord with the legal rights and liabilities of the parties.

14. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

15. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964 and the regulations of the Secretary of Agriculture (7 C.F.R. 15.1-15.12), which provide that no person in the United States shall on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving federal financial assistance.

16. This agreement will not become effective until the Service has issued a notification of approval and authorizes assistance.

Chenango County Board of Supervisors

By _____

Title _____

Address _____
Zip Code

Date _____

The signing of this agreement was authorized by a resolution of the governing body of the Chenango County Board of Supervisors adopted at a meeting held on _____.

_____
(Secretary, Chenango County Board of Supervisors)

Address _____
Zip Code

Date _____

Chenango County Soil and Water Conservation District

By _____

Title _____

Address _____
Zip Code

Date _____

The signing of this agreement was authorized by a resolution of the governing body of the Chenango County Soil and Water Conservation District adopted at a meeting held on _____.

_____
(Secretary, Chenango County Soil and Water Conservation District)

Address _____
Zip Code

Date _____

Village of New Berlin

By _____

Title _____

Address _____
Zip Code

Date _____

The signing of this agreement was authorized by a resolution of the governing body of the village of New Berlin adopted at a meeting held on _____.

_____
(Secretary, Village of New Berlin)

Address _____
Zip Code

Date _____

New York State Department of Environmental Conservation

By _____

Title _____

Address _____
Zip Code

Date _____

The signing of this agreement was authorized by a resolution of the governing body of the New York State Department of Environmental Conservation adopted at a meeting held on _____.

_____
(Secretary, Department)

Address _____
Zip Code

Date _____

Appropriate and careful consideration has been given to the environmental statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service
United States Department of Agriculture

By _____
(State Conservationist)

Date _____

MILL BROOK WATERSHED

Chenango County, New York

Prepared Under the Authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended and in Accordance with the National Environmental Policy Act of 1969, Section 102 (2) (C) Public Law 91-190-91st Congress 83 Stat. 853.

Prepared by: Chenango County Board of Supervisors
Chenango County Soil and Water Conservation District
Village of New Berlin
New York State Department of Environmental Conservation
USDA, Soil Conservation Service
USDA, Forest Service

April 1975

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CHENANGO COUNTY, NEW YORK

SUMMARY OF PLAN

Mill Brook Watershed, located in Chenango County, New York, comprises an area of 2,960 acres, including a portion of the village of New Berlin. The Sponsoring Local Organization includes the Chenango County Soil and Water Conservation District, Chenango County Board of Supervisors, village of New Berlin, and the New York State Department of Environmental Conservation.

Beginning at the 5-year frequency level, up to 13 acres of urban land are subject to periodic inundation. A recurrence of the 1905 flood, considered to be a 100-year frequency flood event, would cause an estimated $272,000 damages to residential and commercial properties, streets and public utilities, and streambank stabilization structures. Estimated average annual floodwater damages are $62,220. Indirect flood damages, such as cost of rerouting traffic and losses of public utilities, amount to $8,120 annually.

Mill Brook Watershed lies within the Central New York Planning and Development Region. It is estimated that the region will experience net deficiencies of about 2,000 spring weekend fisherman days and 20,000 weekend day-use days by the year 1990.

This plan provides for land treatment measures, one floodwater retarding structure, one multiple-purpose structure, one recreational and fish and wildlife development, and 0.25 miles of channel work. All measures are expected to be installed within a 5-year period.

Installation of the land treatment measures, as outlined in this plan, will reduce runoff from the 100-year frequency flood by about 3.6 percent and reduce flood damages by about $680 annually. Woodland wildlife habitat would be increased by about 15 acres.

Installation of the structural measures will provide urban protection for floods of magnitudes up to the 100-year frequency event, thus eliminating flood damages evaluated. About 21 residences, 19 commercial establishments, and about 80 flood plain residents would directly benefit. In addition, an estimated 39,667 visitor days of recreation will be created. Recreational activities to be created by the structural measures include fishing, picnicking, swimming, and nature studies. Average annual sediment yields at the mouth of the watershed will be reduced approximately 300 tons per year.

Installation of structural measures will result in wildlife habitat losses on about 51 acres of cropland, 23 acres of pastureland, and 55 acres of forest land. Wildlife habitat of about 51 acres of wetland (open water) and 78 acres of open land will be created. About 1,318 feet of open modified channel will be converted to a reinforced concrete conduit, 4,000 feet of natural channel will be inundated, and 2,450 feet of natural channel will be subject to periodic inundation. Production from about 51 acres of cropland, 118 acres of pastureland, and 19 acres of forest land will be lost, and about 24 acres of pastureland and 4 acres of forest land will become subject to periodic inundation.

The Chenango County Soil and Water Conservation District will be responsible for planning land treatment measures with technical assistance provided by the Soil Conservation Service and the Forest Service. Landowners and operators, with assistance furnished by the Soil Conservation Service and Forest Service, will be responsible for establishing and maintaining these practices.

The Chenango County Board of Supervisors will provide all landrights; administer contracts for the floodwater retarding structure, recreational and fish and wildlife development, and channel work; and operate and maintain floodwater retarding structure No. 1. The New York State Department of Environmental Conservation will administer the contract for the multiple-purpose structure, and assume non-Public Law 566 costs involved in the construction of the multiple-purpose structure and landrights acquisition for the recreational and fish and wildlife development.

Chenango County and the New York State Department of Environmental Conservation will share the non-Public Law 566 costs involved with installation of the recreational and fish and wildlife facilities.

The village of New Berlin will grant permits for underpinning the Academy Street bridge and operate and maintain the channel work.

The Soil Conservation Service will provide engineering services required for the installation of the multiple-purpose structure, floodwater retarding structure, and the channel work. The Sponsors and the Service will bear project administration costs that each incurs.

Total installation cost of the combined land treatment and structural measure is about $1,688,500. Of this amount, $1,290,700 will be funded by Public Law 566 and $397,800 will be paid by other funds. Total land treatment cost is $39,400, including $8,300 from Public Law 566 funds for technical asistance and $31,100 from other funds. Total structural measures cost is $1,649,100 including $1,282,400 from Public Law 566 funds and $366,700 from other funds.

Average annual operation and maintenance costs of $17,800, including $13,600 for operation, maintenance, and replacement for the recreational and fish and wildlife facilities, will be borne by the Sponsoring Local Organization. The average annual cost of the structural measures is estimated to be $131,400. These measures are expected to produce average annual benefits of $165,700. The ratio of total average annual benefits to average annual cost of structural measures is 1.3:1.

All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service and the Forest Service of the United States Department of Agriculture.

WATERSHED RESOURCES - ENVIRONMENTAL SETTING

PHYSICAL DATA

Mill Brook Watershed is located in the northeastern portion of Chenango County in south-central New York. It is approximately 48 miles southeast of Syracuse (population 197,210), 46 miles northeast of Binghamton (population 64,120), and 36 miles south of Utica (population 91,610) (32). See the Watershed Location Map, Figure 1. The total drainage area is 4.62 square miles or 2,960 acres. It is about 3 miles in length and varies in width from about 3 miles at the western boundary to less than one-half mile at the village of New Berlin.

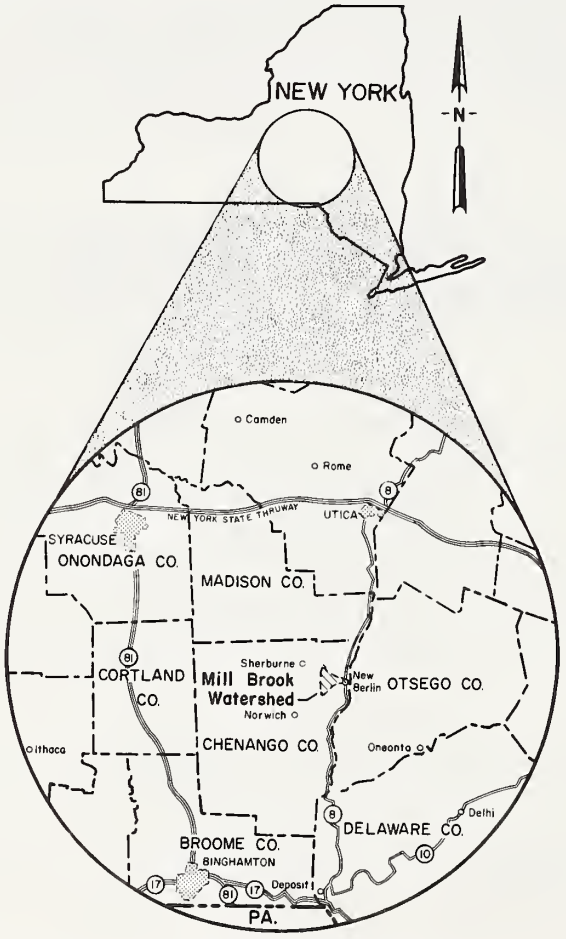


FIGURE 1 - WATERSHED LOCATION MAP

FIGURE 2 - WATER RESOURCE REGION MAP

The watershed is located in the Water Resources Council's Middle Atlantic Water Resource Region and the Susquehanna Subregion (0205) (Figure 2 - Water Resource Region Map). Conditions and characteristics of the watershed are similar to those in the Susquehanna Subregion, which is covered by rolling to steep glacial topography, except for the flat river valleys. Table A illustrates present and projected populations and per capita income for the region, subregion, and the village of New Berlin.

The primary soil and water resource problem is flooding in the village of New Berlin. An area of approximately 13 acres is subject to occasional inundation with resultant damage to 21 houses, 19 businesses, and several streets and bridges. High velocities in the previously modified channel, in the urban area, damage bank stabilization structures. (See Appendix A, Urban Flood Plain Map.) The forecasted recreational needs of the Central New York Region show that the capacity should be expanded by 21.7 percent over the next 20 years.

Temperature and precipitation are characterized by a humid continental-type climate (14). Summers are relatively cool with temperatures averaging about 63 degrees from May through September. Winters are generally colder and snowier than in other parts of

TABLE A - WATER RESOURCE REGION PROJECTIONS

Year	Middle Atlantic Region 1/	Susquehanna Subregion 1/	Village of New Berlin
		POPULATION	
1970	38,639,058	3,547,524	1,369 2/
1980	44,262,900	3,806,700	1,468
2000	50,365,800	4,301,600	1,656
		PER CAPITA INCOME (1967 $)	
1970	3,994	3,136	1,950 3/
1980	5,400	4,400	2,730
2000	9,000	7,700	4,777

1/ U. S. Water Resources Council; 1972 OBERS PROJECTIONS, SERIES E Population: Regional Economic Activity in the U. S., Vol. 3, Water Resource Regions 1-8, U. S. Government Printing Office, Washington, D. C.

2/ U. S. Bureau of the Census: Census of Population: 1970 GENERAL SOCIAL AND ECONOMIC CHARACTERISTICS, Final Report PC(1)-C34 New York; U. S. Government Printing Office, Washington, D. C.

3/ Chenango County Planning Board, January 15, 1973.

the Appalachian Region of New York. Maximum and minimum temperatures recorded at Norwich are 101 degrees and minus 31 degrees, respectively. Average annual precipitation is approximately 41 inches with about 50 percent falling during the 135 day growing season (6) (Figure 3, Monthly Precipitation Distribution). Average annual runoff is approximately 20 inches. Average annual lake evaporation is approximately 28 inches.

The watershed lies in the Allegheny Plateau Physiographic Province, a rolling terrain of glacial till covered uplands with glacial outwash deposits in the major stream valleys.

Elevations range from about 1,800 feet at the western boundary to about 1,080 feet above mean sea level at the confluence of Mill Brook with the Unadilla River. The stream valleys are relatively steep with little flood plain, except at the village of New Berlin.

Bedrock is predominantly shale and sandstone of the Genesee Group, Devonian age (10). Exposures are found in the stream bed, on the northern tributary, and at the junction of the two tributaries, upstream of the village line. On the southern tributary bedrock is exposed in the stream channel, upstream from the existing village reservoir.

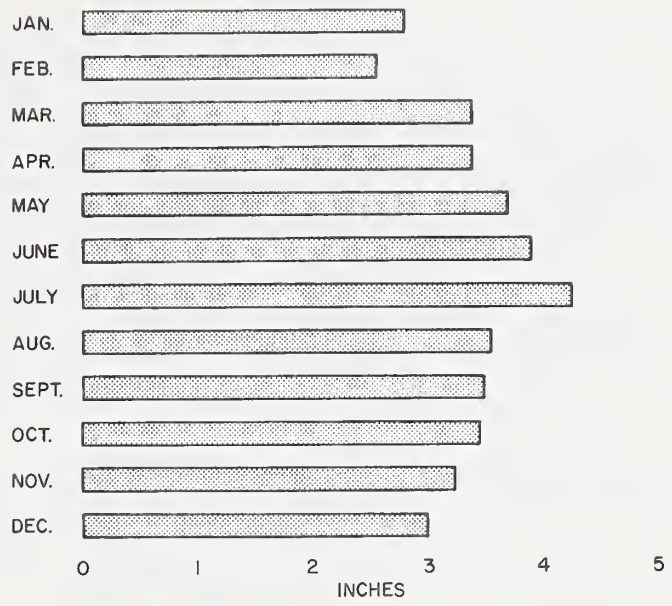


FIGURE 3 - MONTHLY PRECIPITATION DISTRIBUTION

Mineral resources in the watershed are limited to localized deposits of sand and gravel. There is one open gravel pit located adjacent to the southern tributary, near the western watershed boundary.

Records from "Earthquake History of United States, Part I," indicate that the area was shaken, at least eight times during the past 300 years, by major earthquakes having epicenters to the north in Seismic Risk Zone 3, the St. Lawrence Valley Region. The most recent of these occurred at Attica, New York, in 1929 and at Massena, New York,in 1944. The damage ratings are based on damage to existing rigid structures (9).

The primary soils in the upland part of the watershed are derived from glacial till. They include Mardin, a moderately well drained soil containing a fragipan; Valois, a deep well drained soil; Lordstown, a moderately deep soil; and Arnot, a moderately shallow soil. Minor areas of Howard soil, formed in permeable glacial outwash material, are found on valley slopes.

Soils have been grouped by land use into land capability subclasses. (See Table B.) Land capability classification (26), is a system by which soils are grouped together by classes and subclasses, based upon their limitations and hazards for agricultural use. Capability classes are designated by Roman numerals, with limitations in use becoming progressively greater from Class I to Class VIII. Capability subclasses are a grouping of soils having similar kinds of limitations and hazards. Four general kinds of limitations or hazards are recognized: (1) e, erosion hazard, (2) w, wetness, (3) s, rooting zone limitations, and (4) c, climate.

TABLE B - LAND CAPABILITY BY LAND USE

Land Use 1/	CAPABILITY SUBCLASSES 2/ IIe Acres	IIw Acres	IIs Acres	IIIe Acres	IIIw Acres	IVe Acres	IVw Acres	Vw Acres	VIIs Acres	TOTAL
Cropland	70	228	60	190	17	90	7			662
Pastureland	60	203	48	312	70	217	20	14	36	980
Forest Land	21	145	3	454	24	400	39	24	130	1,240
Urban and Other Land			58	10		10				78
TOTAL	151	576	169	966	111	717	66	38	166	2,960

1/ Cropland - Land which is used for row crop, close-grown field crops, fallow, rotation hay and pasture, and hayland.
Pastureland - Land producing forage plants for animal consumption.
Forest Land - Land at least 10 percent stocked or formerly stocked by forest trees, noncommercial trees, and afforested (plantations) areas.
Urban and Other Land - Built-up areas, industrial and commercial sites, farmsteads, farm roads, feedlots, ditch banks, fence and hedgerows, marshes, and recreation areas.

2/ Capability classes I, VI, and VIII do not occur within this watershed.

Ninety percent of the forest cover is comprised of the northern hardwood type (7). Sugar maple, red maple, and beech are the predominant species with associated mixtures of white ash, black cherry, basswood, hemlock, and white pine. The remaining 10 percent of forest cover is in plantations containing white pine, red pine, Norway spruce, and larch in pure or mixed stands. Woodlots generally vary in size from 10 to 50 acres, however, there is one large woodlot of approximately 400 acres.

General plant communities that provide wildlife habitat are shown in Table C.

TABLE C - WILDLIFE RESOURCE HABITAT PLANT COMMUNITIES

Land Use	Acres	Plant Communities
Cropland	662	Corn, oats, alfalfa, clover, and timothy
Pastureland	980	Woody - thornapple, dogwood and aspen Herbaceous - grasses, clover, trefoil, plantain, nut sedge, dandelion, and bedstraw
Forest Land	1,240	Sugar maple, red maple, beech, white ash, black cherry, basswood, hemlock, and white pine with small plantations of white pine, red pine, Norway spruce and larch
	8	Wetlands - Alder, buttonbush and dogwood
Water	8	Species of algae, potamogeton, sagettaria, and nymphaea
Urban and Other	62	Woody - ornamental trees and shrubs Herbaceous - domestic grasses

The ground water supplies are estimated to be adequate to meet future needs. Well yields from the upland areas range from 10 to 30 gallons per minute; the acquifers are in glacial till or bedrock. Well yields from the flood plain of the Unadilla River range from 5 to 30 gallons per minute; the acquifers are in sand, gravel, or bedrock

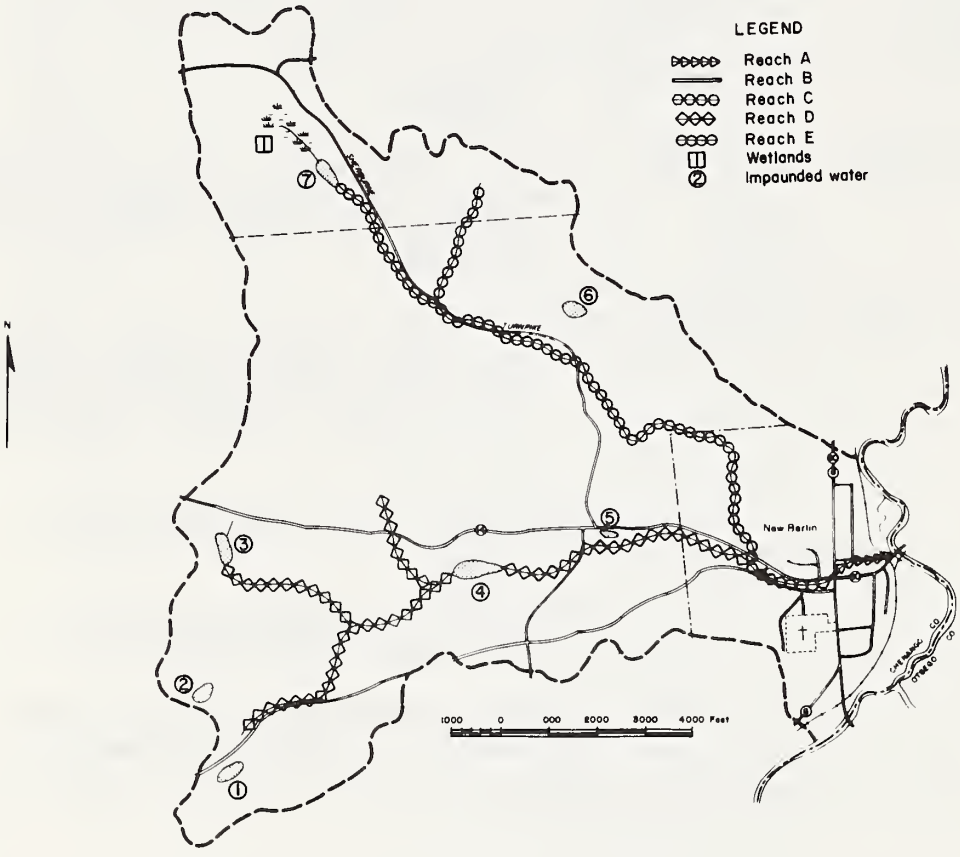


FIGURE 4 - SURFACE WATER RESOURCE MAP

The existing water system, serving the village of New Berlin, is a combined gravity and pumped system supplied from a small reservoir, a system of springs, and two wells (13). The only treatment of the supply is chlorination. Water quality tests indicate a hardness of 124 parts per million and alkalinity of 121 parts per million (8).

The present sources, excluding the small reservoir, have a combined yield of about 0.14 million gallons per day , which is insufficient to meet the maximum daily demands in 1970 of 0.22 Mgal/d. Maximum daily demands are assumed to be twice the average daily demand. The reservoir, constructed in 1887, is used as an emergency source and is adequate to meet maximum daily demands. Metcalf and Eddy (13) proposed to increase the supply capacity of the system by staged construction of two wells to meet the maximum daily demand of about 0.44 Mgal/d in the year 2020.

There are two main tributaries in the Mill Brook Watershed. The northern tributary drains an area of about 1,520 acres and the southern tributary drains an area of about 1,340 acres. These tributaries flow in an easterly direction, joining near the western edge of the village of New Berlin (Figure 4, Surface Water Resource Map). The stream flows under West Street, Main Street, and three commercial buildings before outletting into the Unadilla River. Existing stream characteristics are described in Table D.

At the request of the Soil Conservation Service, a water sample on Mill Brook, at New Berlin, was taken by the New York State Department of Health. The results of the laboratory analysis of this sample are displayed in Table E. Although one point sample is inconclusive, there were no parameters which indicated the evidence of major pollution sources.

TABLE D - EXISTING STREAM CHARACTERISTICS

Reach 1/	Length (miles)	Channel Type	Flow 2/	Vegetative Cover (%)	Water Quality 3/	Physical Description 4/ Pool/Riffle (%)	Depth (inches)	Width (feet)	Bed Material 5/
A-Outlet to Main Street	0.25	Modified Open Channel	Perennial	90	D	Riffle-100	10	16	Gravel Rubble
B-Main Street to inlet of culvert	0.07	Box Culvert	Perennial		D	-	-	-	-
C-Box culvert inlet to stream intersection	0.30	Natural Well Defined	Perennial	40 Within Pool Shelter-20%	D	Pool-14 Riffle-86	23 10	14 16	Sand and Gravel Gravel Rubble
D-Southern Tributary	3.50	Natural Well Defined	Inter-mittent	33 Within Pool Shelter-21%	C(T)	Pool-12 Riffle-72 Cascades-16	16 7 -	11 8 -	Sand and Gravel Gravel Rubble
E-Northern Tributary	2.70	Natural Well Defined	Inter-mittent	80 Within Pool Shelter-26%	C(T)	Pool-8 Riffle-92	18 7	8 9	Sand and Gravel Gravel Rubble

1/ See Figure 4 - Surface Water Resource Map.

2/ Reconnaissance Report, Mill Brook Watershed, dated February 5, 1973, Bureau of Sport Fisheries and Wildlife, USDI.

3/ Class C - Fishing and any other usages except for bathing or as source of water supply for drinking, culinary, or food processing purposes. (Class C(T) indicates trout stream.)
Class D - Agricultural or source of industrial cooling or process water supply and any other usage except for fishing, bathing, or as source of water supply for drinking, culinary, or food processing purposes. Source: Classifications and Standards Governing the Quality and Purity of Waters of New York State (Parts 700-703, Title 6, Official Compilation of Code, Rules, and Regulations, New York State DEC, Albany, N. Y.).

4/ Stream physical descriptions determined in April 1974. Approximate flow at watershed outlet was 20 cubic feet per second.

5/ Bedrock outcropping are common.

TABLE E - WATER QUALITY DATA 1/
Mill Brook at New Berlin

Parameter	Unit	Result
Color	Apparent	7.
Turbidity	J.T.U.	0.9
Ammonia Nitrogen	MG/L	0.01
Nitrite Nitrogen	MG/L	6.
Nitrate Nitrogen	MG/L	1.0
Chlorides	MG/L	6.2
Hardness	MG/L	108.
Alkalinity	MG/L	112.
PH (Laboratory)		8.3
Sulfates	MG/L	10.
Total Residue	MG/L	271.
Total Volatile Residue	MG/L	155.
Color (Field)		1.015
Turbidity (Field)		1.
Water Temp. at Site	Deg. C	22.
PH (Field)		8.0
Dissolved Oxygen-Field	MG/L	8.8
Cloud Cover	Percent	10.
Air Temperature	Deg. C	27.
Weather		1.
Suspended Matter	MG/L	5.
Volatile Suspended Matter	MG/L	1.
B.O.D. 5 Day	MG/L	0.2
KJELDAHL-N Incl. Ammonia	MG/L	0.23
Chemical Oxygen Demand	MG/L	4.
Iron	MG/L	0.02
Manganese	MG/L	0.02
Potassium	MG/L	1.4
Sodium	MG/L	1.4
Calcium	MG/L	43.
Magnesium	MG/L	1.
Coliform Bact.	MF Col/100ML	570.
Conduc 25 Deg.	micro mhos/SQ CM	150.
Total Phosphates	MG/L	0.02
Orthophosphate	MG/L	0.22

1/ Sample taken by the New York State Department of Health, Division of Laboratories and Research, Environmental Health Center on July 30, 1973.

In March 1974, the Environmental Protection Agency, Rochester, New York, began to periodically sample water quality at four locations on Mill Brook. Results of these analyses will be available at the EPA Office after laboratory analyses are completed. Any significant new information will be included in the final environmental statement.

There are seven water impoundments located within the watershed. Location of these impoundments may be found on Figure 4, Surface Water Resource Map. Table F exhibits the physical characteristics of these impoundments.

TABLE F - LAKES AND PONDS

Impoundment	Size (acres)	Type	Ownership	Use
1	2.0	Manmade	Private	Livestock and wildlife
2	2.0	Manmade	Private	Livestock and wildlife
3	1.0	Manmade	Private	Livestock and wildlife
4	2.5	Manmade Reservoir	Village of New Berlin	Supplemental Water Supply
5	0.1	Manmade	Private	Livestock and wildlife
6	0.2	Manmade	Private	Livestock and wildlife
7	0.2	Manmade	Private	Livestock and wildlife

The watershed contains one wetland, approximately 8 acres in size. See Figure 4, Surface Water Resource Map for location. The lower portion of this wetland has been developed into a pond. The undisturbed portion of the wetland is classified as Type 6 (Shrub swamps) (25). The soil is usually waterlogged and may be covered with up to 6 inches of water. Woody vegetation consists of alder, buttonbush, and dogwood.

ECONOMIC DATA

The watershed is located approximately 30 miles south of the major industrial, transportation, and population belt of the state. This region is characterized by mixed agricultural and industrial service centers, interconnected by the New York State Thruway (Interstate 90) and the State Barge Canal System. Major industrial centers along this corridor include Syracuse, Utica, Amsterdam, Schenectady, and Albany. The system of state and county roadways provide access, for marketing and commuting, to these centers. Route 8 is the main north-south route passing through the village of New Berlin. (See Figure 1, Watershed Location Map.) Two county roads are located in the central and northern portion of the watershed providing access from rural areas to the village of New Berlin.

The economic base of New Berlin is related to that of the surrounding agricultural area. Opportunity for local employment is limited to farms, a feed mill, shoe manufacturing, a nursing home, and service type commercial businesses. There is considerable commuting to nearby industrial jobs. Chenango County has experienced substantial unemployment in recent years, consistently higher than the state average. Comparison of unemployment rates (19) as of November 1973 are: Chenango County, 5.0 percent; New York State, 4.9 percent; and the United States, 4.7 percent.

There are 16 full-time upland family farms in the watershed averaging approximately 100 acres in size. Dairy farming is the principal type of agriculture. There is also some production of poultry products. In addition to the 16 full-time farms, there are 19 nonfarm ownerships. Nonfarm ownerships consist of individual dwellings on one to five acre lots. These residents are dependent upon their own wells for water supply and septic tanks for sewage. Some of these people are employed as farm laborers. Others commute to jobs in nearby villages and cities.

Principal crops and crop yields, according to 1969 agriculture census data are listed in Table G.

TABLE G - CROPS AND CROP YIELDS

Crop	Yield/Acre	Unit
Corn - grain	98	Bushel
Corn - silage	16	Ton
Alfalfa hay	3	Ton
Clover and Timothy	2	Ton
Oats	58	Bushel
Grasses - silage	5	Ton

There is no forest industry within the watershed boundary. However, there is a strong market in the surrounding area for hardwood sawlogs and some demand for veneer stock. Markets for pulpwood and low grade logs are very slight, but the feasibility of an increased demand in the future does exist. About 40 percent of the forest acreage contains sawtimber stands with 1,500 or more board feet per acre. Forty-five percent of the forest stands are classed as pole size and 15 percent as seedling or sapling.

Most of the land in the watershed is privately owned. The only public ownership is a 41-acre tract belonging to the village of New Berlin. The acreage surrounds the village reservoir.

Historically, construction of new dwellings has been equal to the demand, and property values have been stable while relatively consistent with regional trends. Land in the village of New Berlin has an approximate average value of $750/acre. Agricultural property values vary with terrain, but the value of cropland average $200-$300/acre. Agricultural land prices are being inflated by second home and recreational purchasers. Farmlands and woodlots have been selling for as much as $1,000/acre for small tracts.

Village plans for population growth include an adequate water supply, streets, medical facilities, newspaper, churches, attractive shopping areas, and new land for development. Plans have been made for a sewer system and water treatment plant for the village.

Mill Brook Watershed is located in the South Central New York Resource Conservation and Development Area and the Appalachia Area. Resource conservation and development projects are initiated and carried out by local people with the assistance of agencies of the states, and agencies of the United States Department of Agriculture. The Appalachian Regional Development Program in New York State is to create an economically attractive environment which, in turn, will stimulate the development of private business and industry, and generate new opportunities for economic and social well-being for the people of this region.

FISH AND WILDLIFE RESOURCES

Wildlife species have diverse requirements and occupy a vast variety of niches in the ecosystem. However, species may be generally grouped by main habitat into forest wildlife, open land or agricultural wildlife, and wetland wildlife. See Table C, Wildlife Resource Habitat Plant Communities.

Forest wildlife species are those which find both food and cover within the forest, although they may venture into open land to feed. Factors affecting the density of these species may include woodlot size, density of humans, and vegetative composition, by type and successional stage. These factors, in conjunction with climatic conditions, determine species range. The woodlots of the watershed provide good habitat for game and furbearing species typical of cutover hardwoods in New York (Table H, Species and Density).

TABLE H - ESTIMATED DENSITIES OF GAME AND FURBEARING SPECIES

Species of the Watershed 1/	Density
Forest Wildlife	
Whitetail Deer	Good (3-4 per 100 acres)
Ruffed Grouse	Good (1 per 10-15 acres)
Gray Squirrels	Good (1 per 2 acres)
Open Land Wildlife	
Cottontail Rabbit	Good (2-3 per 10 acres)
Raccoon	Moderate (1 per 20-25 acres)
Skunk	Unknown
Opossum	Unknown
Ringneck Pheasant	Very low (less than 1 per 100 acres)
Wetland Wildlife	
Waterfowl	Migrant - very low nesting (2 per 10 acres)
Woodcock	Migrant - very low nesting (2-3 per 100 acres)
Muskrat	Unknown
Mink	Unknown

1/ A listing of nongame mammals found throughout New York is found in Appendix B.

Open land or agricultural wildlife species commonly find food in open fields, close to woody vegetation (hedgerows, forest edges, etc.), which provides escape and winter cover. The type of agriculture and management practices are important factors determining habitat suitability.

Early mowing, fall plowing, decreasing grain production, and the elimination of hedgerows are some practices detrimental to open land wildlife. Agricultural land management limits populations of species

such as the ringneck pheasant which depend on high grain production for high densities.

Species commonly associated with water are known as wetland wildlife (waterfowl), shorebirds, and furbearers. The density of these species are determined by the abundance of open surface water and variety of aquatic vegetation. The limited surface water resources and wetlands of the watershed has evolved a wetland wildlife community comprised primarily of mammals. Woodcock and migratory waterfowl pass through the area, but little nesting is found. A variety of aquatic amphibians and reptiles is common throughout the habitat (Appendix B, Listing of Reptiles and Amphibians).

Surface water resources provide very little public sport fishing. A cold water trout fishery exists in the northern tributary (reach E), primarily above Sherburne Turnpike (1.5 miles). See Figure 4, page 10. A July 1958 shocking of the reach (New York State Department of Environmental Conservation) produced wild brook trout ranging from 2 1/2 to 9 inches in length. Competitive species included creek chubs and blacknose dace. Although maintained by natural reproduction, fish of harvestable size are limited due to lack of pools and low base flow.

Trout rarely occur in the southern tributary (reach D). The New York State Department of Environmental Conservation Survey of 1958 produced only two brook trout. Suckers and blacknose dace are common. Trout which occur in this reach are limited to small spring fed pools because of low flows and lack of shade.

Reaches A, B, and C do not contain trout. Fish species of these reaches include creek chubs, blacknose dace, and suckers.

The small impoundments of the watershed support bass and bluegill fisheries which are limited to private use.

Present land use of the potential impoundment sites is found in Figures 5 and 6. Land use and wildlife affected are shown in Table I. These areas represent 8 percent of the total watershed area. Present land use in the location of the proposed channel work is urban, consisting primarily of the existing channel and backyards of residences.

Hunting opportunities in the watershed are few. Much of the land where game species occur is posted and hunter-use is limited to landowners and their friends. Most hunting occurs on state game lands in surrounding counties, especially during deer season.

TABLE I - WILDLIFE HABITAT RESOURCES AT POTENTIAL STRUCTURE SITES

Structure Location	Crop-land (Acres)	Forest land (Acres)	Brushy Pasture (Acres)	Stream Channel 1/ (Feet)	Wildlife Species
Site 1					
Construction Area	-	5	3	500	Songbirds, rabbits, grouse and some browse for deer
Flood Pool	-	3	14	2,050	Songbirds, rabbits, some browse for deer, and an occasional woodcock
Sediment Pool	-	1	-	300	Rabbits, songbirds and some browse for deer
Borrow Area	10	-	-	-	Songbirds
Site 2					
Construction Area	-	8	8	300	Rabbits, Songbirds and some browse for deer
Permanent Pool	1	5	44	2,900	Rabbits, songbirds and some browse for deer
Emergency Spillway Crest Elevation	1	-	5	200	Songbirds and an occasional rabbit
Maximum Area Flooded	1	-	3	200	Songbirds and an occasional rabbit
Public Development and Wildlife Areas	38	6	60	-	Songbirds, rabbits, and some cover for deer
TOTAL	51	28	137	6,450	

1/ No sport fishery exists.

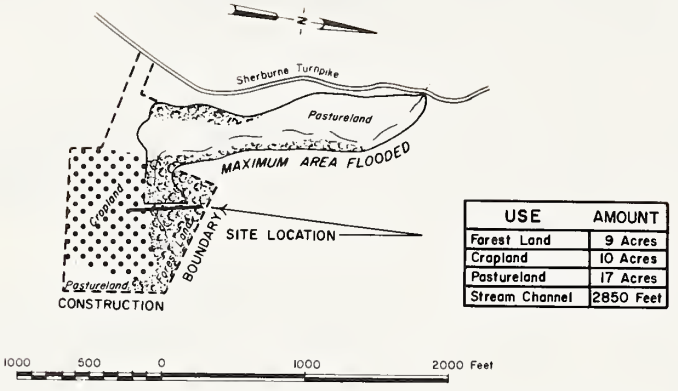


FIGURE 5 - WILDLIFE HABITAT AT POTENTIAL SITE 1

Rare and endangered species of New York State are listed in the publication, "Rare and Endangered Fish and Wildlife of the United States," U. S. Bureau of Sport Fisheries and Wildlife, 1966 Edition (34). Investigations indicate that no species listed in this publication are in or near the watershed.

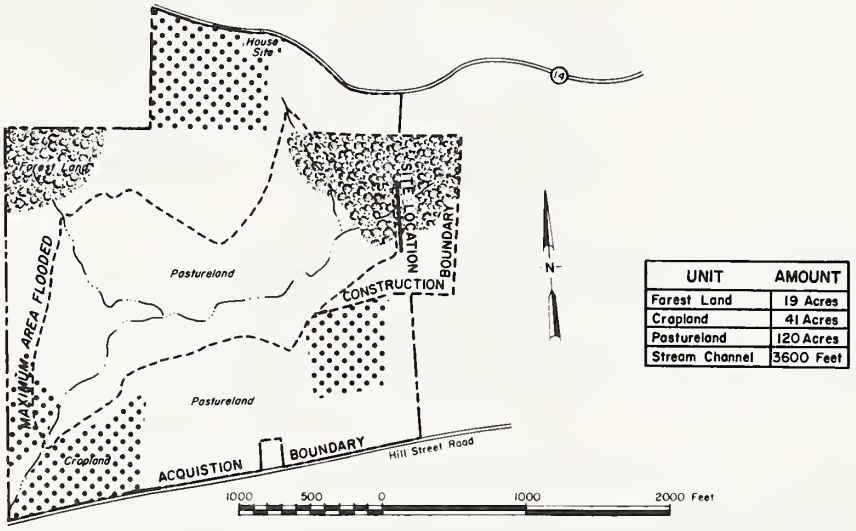


FIGURE 6 - WILDLIFE HABITAT AT POTENTIAL SITE 2

RECREATIONAL RESOURCES

Existing recreational resources and the potential for recreational use include scenic and water resources, fish and game resources, and winter recreation resources.

The topography of Chenango County presents a panorama of rolling hills and valleys. Perhaps the most pronounced scenic asset is the broad Unadilla Valley. The western half of the county is dotted with numerous small ponds and lakes which are scenic assets.

The Unadilla River and the small lakes and ponds are available for warm water fishing. Two major streams for trout fishing are the Otselic River in the northwestern corner of the county and Genegantslet Creek in the western portion of the county. Fish and game resources, for the watershed specifically, are indicated in the preceding "Fish and Wildlife Resources" section.

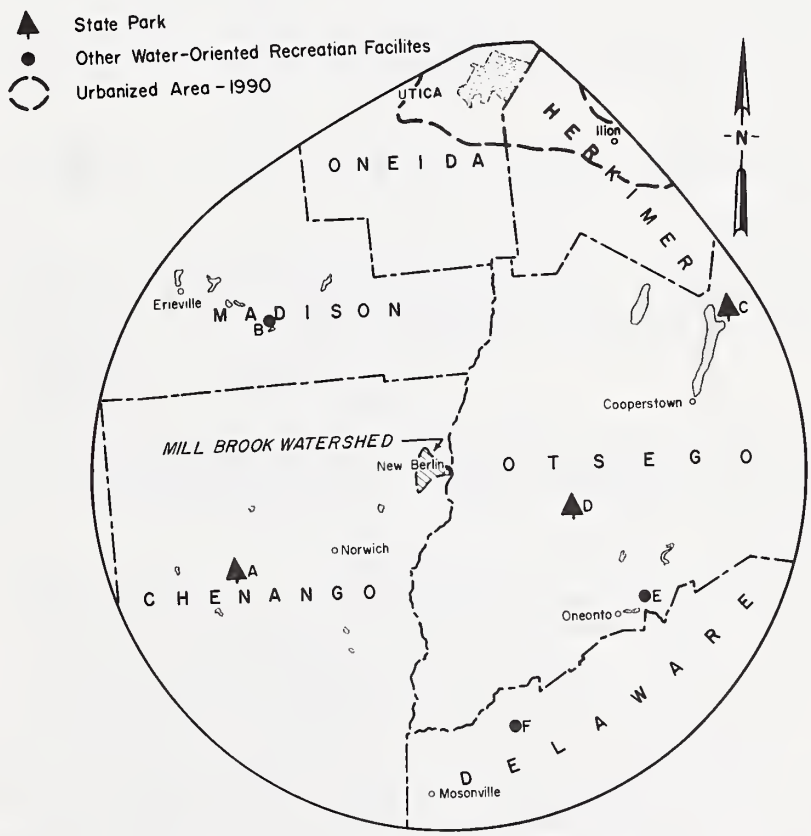


FIGURE 7 - LOCAL AREA OF INFLUENCE MAP

TABLE J - WATER BASED DAY-USE
RECREATION FACILITIES WITHIN THE LAI

(Picnicking, Lake Swimming, Playfields)

Map Code	Facility	Size Lake (Acres)	Picnic Tables (No.)	Swimming Beach (Lin.Ft.)
	Chenango County			
A	Bowman Lake State Park	35	235	450
	Madison County			
B	Lebanon Reservoir Picnic Area	90	50	210
	Otsego County			
C	Glimmerglass State Park (Otsego Lake)	3,987	425	900
D	Gilbert Lake State Park	40	775	400
E	Wilber Town Park	20	70	200
	Delaware County			
F	East Sidney Dam	200	25	300
TOTAL		4,372	1,580	2,460

Source: New York State Outdoor Recreation Facility Inventory, Office of Parks and Recreation, Albany, New York, May 1972.

There are no water based recreation facilities located within the watershed. However, within the "local area of influence" (LAI), there are three state parks and three other recreation facilities that provide water based day-use recreation activities (Table J). The local area of influence is the distance recreationists will generally drive to participate in day-use activities such as picnicking and swimming. The LAI for Mill Brook Watershed consists of all of Chenango County, half of Madison, four-fifths of Otsego, and one-fifth of Oneida, Herkimer, and Delaware Counties. This includes the metropolitan city of Utica, which is on a major highway leading to Mill Brook. Day-use capacity needs are shown in Table K.

TABLE K - AVERAGE DAY-USE RECREATION FACILITIES CAPACITIES AND NEEDS

	Day-Use Needs		Available Capacity
	1970	1990	1970
Swimming	744,000	875,000	307,000
Picnicking	786,000	981,000	790,000

The existing water based day-use recreation facilities are generally well distributed throughout the LAI (Figure 7, Local Area of Influence Map).

There are no locations in the watershed where there is sufficient vertical drop in topography to support a ski area based upon the minimum of 600 feet change in elevation. Though the county has few dramatic topographic changes, the generally rolling terrain and high snowfall on areas of higher elevation suggest that snowmobiling, sledding, and tobogganing are enjoyed.

ARCHEOLOGICAL AND HISTORICAL VALUES AND UNIQUE SCENIC AREAS

The Office of New York State Parks and Recreation identified three historic places in the village of New Berlin. These places are Preferred Manor, a building nominated to the National Register of Historic Places; the New Berlin Library; and Upjohn's St. Andrews Church (Urban Flood Plain Map).

A New York State Museum and Science Service literature review revealed no archeological sites in the vicinity of planned structural measures. As there is a significant hilltop site (Indian activity) identified in the general area, the Museum and Science Service recommended that an archeological survey be conducted at the proposed structural sites. An archeological survey is scheduled to be completed during the summer of 1974 by a Kirkland College anthropologist.

SOIL, WATER, AND PLANT MANAGEMENT STATUS

The most obvious trend in land use change is that of cropland being converted to pastureland. Much of the pastureland is changing through natural succession from herbaceous plants to woody growth and will eventually become forest land if left uncontrolled. Projected future land use is shown in Table L.

TABLE L - PRESENT AND FUTURE LAND USE

Land Use	Present Use		Future Use Without Project (2000)	
	(percent)	(acres)	(percent)	(acres)
Cropland	22	662	19	572
Pastureland	33	980	33	963
Forest Land	42	1,240	44	1,297
Urban and Other	3	78	4	130
TOTAL	100	2,960	100	2,960

Inefficient use of factors of production (land, labor and capital) are being applied to about 90 acres of capability subclass IVe and seven acres of capability subclass IVw cropland. However, the IVw soils are included in larger fields of better drained soils. About 36 acres of pasture in capability subclass VIIs are being inefficiently used and are producing low returns.

The Chenango County Soil and Water Conservation District has been conducting an intensive program of land use planning and installation of treatment measures. Fifty-seven percent of the land area within the watershed is under District agreement. Of the 16 cooperators in the watershed, 15 have basic conservation plans and approximately 80 percent of the cropland practices have been applied. About 30 percent of the pastureland is being managed under a regular pasture and hayland management system. Brush control measures have been applied to about 40 percent of the pastureland.

Land "adequately treated" includes 330 acres of cropland, 280 acres of pastureland, 860 acres of forest land, and 70 acres of urban and other land. Land adequately treated is defined as land used within its capability on which the conservation practices that are essential to its protection and planned improvement have been applied.

All land in the watershed is adequately protected in that it has annual soil losses within tolerance limits for the soils occurring in the area, with the exception of one gravel pit and 850 feet of eroding streambank. Land "adequately protected" is defined as land on which the soil, water, and related plant resources are adequately protected from deterioration, either naturally or by action of the land user.

Adequate forest fire protection is being provided by local volunteer fire departments and the New York State Department of Environmental Conservation in cooperation with the U. S. Forest Service through the Clarke-McNary Cooperative Forest Control Program. There have been no forest fires in the watershed during the last five years. State-Federal Cooperative Forestry Programs presently providing assistance in the area include: Cooperative Forest Management (CFM), Cooperative Forestation (CM-4), and Cooperative Forest Insect and Disease Control.

WATER AND RELATED LAND RESOURCE PROBLEMS

LAND TREATMENT

There are about 36 acres of capability class VIIs pastureland that should have an adjustment in land use due to steepness of slopes and rocky conditions. These conditions limit use of modern farm equipment in reestablishment of vegetation and application of management practices.

There are about 330 acres of cropland, 700 acres of pastureland, 380 acres of forest land and 8 acres of urban and other land on which treatment has not been planned.

Though the average soil loss per acre shown in Table M are within tolerable levels, the 2-ton per acre soil loss can be further reduced with planned conservation practices. Also, the productivity and efficiency of use can be improved.

Approximately 177 acres of capability subclass IIIw and IVw in the watershed need drainage or other water control measures to improve crop yields and increase efficiency of use.

There are about 217 acres of capability cubclass IVe pastureland in the watershed on which management practices need to be improved.

Land, labor, and capital are being used inefficiently on about 380 acres of forest land where management guidelines are lacking. Trees are being harvested indiscriminately, tree stands need improving, and erosion is occurring on skid trails and access roads.

FLOODWATER DAMAGE

Urban flood damages in the village of New Berlin begin approximately at the 5-year frequency flood. 1/ From the 5 to 10-year frequency flood, damage is limited to yards, driveways, and bank stabilization structures. The capacity of the box culvert upstream of Main Street is exceeded by floods greater in magnitude than the 10-year event. From the 10 to 100-year frequency flood, basements, garages, and first floors are flooded, and streets and sidewalks are damaged. Approximately 21 houses and 19 commercial buildings, including one housing the

1/ A 5-year frequency flood is the peak discharge expected to be equaled or exceeded 20 times during a 100-year period or has a 20 percent chance of occurrence during a given year.

New Berlin Library, are subject to flood damage by the 100-year event (Appendix A - Urban Flood Plain Map). Erosion by floodwater is also responsible for the deterioration and failure of several bank stabilization measures presently installed in the channel. The undercutting of these structures has caused many of them to either fall into the channel or lean toward the channel to a point where they will eventually fail. Estimated value of property subject to flooding is $661,000.

The flood of record, estimated at 100-year frequency, occurred in 1905. While no damage records are available, photographs of damages are on display in the local publishing office. One person was killed, foundation walls were cracked, buildings were shifted on their foundations, streets and sidewalks were destroyed, and retail merchandise was damaged. Estimated future damages of $272,000 would result if a storm of this magnitude were to recur.

The total flood plain in the rural reaches of the watershed is less than 16 acres. Land use is forest and pasture. Flood damages were not evaluated in these reaches.

Average annual floodwater damages to urban properties, including residences, commercial buildings, streets, and public utilities are estimated to be $30,510. Average annual floodwater damage to the channel stabilization structures on Mill Brook, through the village, are estimated to be $23,590. Indirect flood damages resulting from loss of sales, employment, and road closings are estimated to be $8,120 annually (Table 5).

EROSION AND SEDIMENT DAMAGE

Erosion, or the wearing away of land surface by running water, wind, ice, or other geological agents, is present throughout the watershed. Erosion occurs in the upland areas as a result of poor management, steep topography, cultural operations, and erosive soils. Erosion in the flat sections of the watershed is occurring, but at a very low rate.

Sheet erosion is the removal of a fairly uniform layer of soil from the land surface by runoff water (23). Sheet erosion rates by land use are shown in Table M.

TABLE M - SHEET EROSION BY LAND USE

Land Use	Sheet Erosion Rates (tons/acre/year)
Cropland	0.40 - 2.00
Pastureland	0.40 - 0.60
Forest Land	0.03 - 0.07
Other 1/	0.90 - 30.00

1/ Includes roads, farmsteads, urban and built-up areas.

A 2-acre gravel pit near the extreme western edge of the watershed is the only significant upland sediment source. Sediment delivered to the stream from this source has been calculated at approximately 20 tons per year.

Streambank erosion is occurring along approximately 850 feet of the channel downstream from the culvert on Main Street. The streambank generally consist of loose gravelly soil with little to no vegetative cover. Estimated sediment contributed to the stream from this source is 30 tons per year.

Rates of erosion vary from storm to storm, with variations in rainfall intensity, soil condition, and vegetative cover. Sediment may be deposited in the stream channel, to remain until subsequent storm runoff carries it downstream.

Sediment is transported by streams as suspended sediment with larger solids moving along the streambed as bedload. Since the specific gravity of soil materials is about 2.65, the particles of suspended sediment tend to settle to the channel bottom, but upward currents in the turbulent flow counteract the gravitational settling. As velocities decrease larger particles settle out with smaller particles remaining in suspension longer to be deposited farther downstream.

Average annual sediment discharge at the mouth of the watershed is approximately 390 tons per year. This is equivalent to a sediment concentration of 57.1 milligrams per liter. The turbidity of a water quality sample (Table E) collected July 30, 1973, was 0.9 Jackson Turbidity Units or approximately 0.9 mg/1.

FISH AND WILDLIFE AND RECREATION

The state's recreation needs over the next two decades have been forecast as a part of the New York State Comprehensive Recreation Plan (21). Overall, an approximate 25 percent expansion of statewide public and private recreation capacities will be required over the next 20 years, ranging from 9 percent to 30 percent for different activities. The recreational needs of the Central New York Region show that the capacity should be expanded by 21.7 percent.

In 1990 there will be an estimated net deficiency of about 2,000 weekend fisherman days and 20,000 weekend day-use days in the Central New York Region (21). The Central New York Region includes the counties of Broome, Cayuga, Cortland, Chenango, Delaware, Madison, Oneida, Onondaga, Oswego, Otsego, Tioga, and Tompkins and a portion of Herkimer County.

The defined LAI of Mill Brook Watershed lies within the Central Recreation Planning and Development Region (Figure 7). The population within the LAI was 164,000 in 1970 and is projected to be 190,000 by 1990. This represents approximately 10 percent of the present and projected population within the Central Region. Existing water based facilities supply approximately 790,000 annual picnic days and 307,500 annual swimmer days. The projected recreation needs for 1990 are 981,000 annual picnic days and 875,000 annual swimmer days. The net unfulfilled needs in 1990 are about 191,000 annual picnic days and 568,000 swimmer days. The Sponsors are interested in developing water based day-use facilities within the watershed to serve the local residents and those from the surrounding villages and towns. Approval to develop a facility passed by a vote of 1303 to 346 taken on May 11, 1971. The State Office of Parks and Recreation has written the watershed sponsors and have indicated that they are in agreement with the need for the additional facilities.

ECONOMIC AND SOCIAL

Farms in the watershed are family operations utilizing a minimum of hired labor. It is estimated that most of the farms are low income-producing units. The watershed is considered to be economically depressed as the per capita income is 36 percent less than the Susquehanna Subregion. See Table A, Population and Per Capita Income, Page 6. Economic stimulation is required to improve the standard of living for area residents, including farm families.

PROJECTS OF OTHER AGENCIES

The village and town of New Berlin have been identified by the Federal Insurance Administration of the U. S. Department of Housing and Urban Development as having special flood hazard areas. To qualify for participation in the National Flood Insurance Program, these communities must adopt adequate land use controls and enforcement measures. Should they fail to comply voluntarily, Article 36 of the Environmental Conservation Law gives the State of New York mandatory authority to impose regulations which would include these communities in the National Flood Insurance Program. These regulations will apply by July 1, 1975 and November 8, 1975 for the village and town respectively.

The New York Statewide Comprehensive Recreation Plan, the Appalachian Regional Development Program, and the South Central New York Resource Conservation and Development Project each have objectives which promote the development of land and water resources. This project proposal will not contravene these objectives, but is a parallel action relative to the proposed land treatment for the control of runoff and erosion, and is complementary to the objectives of flood protection and recreation.

PROJECT FORMULATION

The Chenango County Soil and Water Conservation District and the Chenango County Board of Supervisors initiated a letter of intent to apply for P.L. 566 planning assistance, as outlined in the Office of Management and Budget Circular No. A-95, in 1968. The Sponsors filed for planning assistance, under P.L. 566 in November 13, 1968, which was approved by the New York State Department of Environmental Conservation, Division of Water Resources, on December 5, 1968. The Soil Conservation Service's State Conservationist requested a planning authorization, from the SCS Administrator, in December 1969; the Administrator authorized planning on January 15, 1969.

Upon receipt of planning authority, the State Conservationist coordinated with the Forest Service and advised the following agencies of the authorization and requested that they provide comments or expressions of interest concerning the project:

Department of Environmental Conservation, New York State
Department of Defense, Army Corps of Engineers
Department of Commerce, National Oceanic and Atmospheric Administration
Environmental Protection Agency
Department of the Interior, Bureau of Mines
New York State Soil and Water Conservation Committee
Chenango County Board of Supervisors
Chenango County Soil and Water Conservation District
Department of the Interior, Bureau of Sport Fisheries and Wildlife
State Office of Planning Coordination
Department of the Interior, U.S. Geological Survey
Department of Agriculture, Farmers Home Administration
Department of Agriculture, Agricultural Stabilization and Conservation Service
Appalachian Regional Commission

Throughout the planning phase of this watershed, the local people were kept informed through open meetings and newspaper articles. During June and July of 1969, four workshops for public information were set up in cooperation with the Mill Brook Watershed Steering Committee, the South Central Resource Conservation and Development Project Council, and the New York State Cooperative Extension. From the date of planning application to June of 1972, there have been over 15 meetings with local interests involved. On November 18, 1971, a public information tour of the watershed was conducted, and included representatives of the Service, the local steering committees, the town board, the county board, and the assistant to Congressman Hanley. The purpose of this tour was to acquaint the public with the location of potential structural measures.

A watershed subcommittee for recreation was formed to help investigate potentials for developing water based facilities. Potential sites were evaluated in the field by the subcommittee and the Service. The group developed a proposed recreation site development plan. Members of the Division of Fish and Wildlife, Lake and Stream Improvement Section, and the Service presented additional site development information. Site development information and cost estimates were presented to the County Board of Supervisors for approval.

In October 1971, representatives of the Bureau of Sports Fisheries and Wildlife, USDI, the Department of Environmental Conservation, and the Soil Conservation Service, made a field reconnaissance to evaluate the fish and wildlife aspects of the project and other environmental considerations.

At a meeting on September 16, 1969, it was decided that the steering committee would inventory the areas above the floodwater retarding sites. to determine sanitary conditions. Information to be included was location of houses, barns, septic tank disposal fields, dairy herds and soil types. This information was presented to the New York State Health Department on February 19, 1970 requesting an opinion as to the suitability of the proposed lake for swimming. The response was that the population and sanitary facilities in the watershed would probably not present a hazard to swimming and that the steering committee should proceed with plans for the swimming areas. It was also stated that a final determination would be made later.

The planning of this watershed has been coordinated with the New York State Office of Parks and Recreation regarding historical and archeological investigation. Details may be found on page 23.

The Environmental Protection Agency is providing an assessment of water quality. Water samples are being taken periodically at various locations on Mill Brook for chemical analysis. Details may be found on page 14.

There have been numerous other meetings with individuals in the watershed to obtain information necessary for the plan.

OBJECTIVES

Specific objectives agreed to as shown in the request for planning assistance are to:

1. Provide protection from flooding up to the 100-year frequency flood throughout the village of New Berlin.

2. Reduce stream channel and bridge cleanout costs.

3. Help meet the water based recreational needs of the area.

ENVIRONMENTAL CONSIDERATIONS

Potential adverse impacts recognized in the formulation of this project, and considerations given to minimize their effects include:

1. Water quality in the proposed multiple-purpose pool may be impaired by recreation users and induced housing developments. Bathhouse facilities, including septic tank disposal fields, will be designed for the recreation facility in accordance with New York State Health Department Regulations. A buffer zone around the flood pool will be acquired to preclude land use and development that would be detrimental to water quality.

2. Destruction of wildlife habitat will occur due to construction. Disturbed areas will be vegetated with desirable species of grasses and legumes, which have a high value for wildlife.

3. Short term erosion rates will be increased during construction. Erosion rates will be minimized by following strict guidelines during construction and adhering to state and local health requirements.

4. No consideration was given to a level of protection less than the 100-year frequency flood since urban flood protection is an objective of the project.

5. Displacement of people, businesses or farm operations may occur. Requirements set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) will be followed in the relocation or displacement.

6. Structural measures may disturb historical places. The project as formulated will not disturb any historical places.

7. The damming of a stream may bring about physical, and possibly chemical, changes in that water. The EPA Rochester Field Office was contacted to address itself to some of these potential changes and offer suggestions to help minimize their effects.

ALTERNATIVES

Many alternatives to the planned project are possible, including some which are not realistic. During the evaluation of alternatives, those which proved to be unworkable or impossible were not explored further.

Land Treatment

This alternative would provide technical assistance to review and make needed revisions of conservation and woodland plans; to maintain existing cover which is adequate and install essential land treatment measures; and to plan and apply land treatment measures applicable to land areas which require treatment.

The land treatment would apply to all land in the watershed. Conservation measures would be applied on cropland, pastureland, forest land, and urban and other land as described under the "Works of Improvement to be Installed" section.

The cost of the land treatment would be about $40,000. Implementation of this alternative would result in the following impacts:

1. Average annual sediment yields at the mouth of the watershed would be reduced by approximately 20 tons.

2. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved, and forest stands would be improved.

3. Fifteen acres of open land would be planted to trees during the project installation period.

This alternative would not meet the selected objectives of the Sponsors. Although floodwater damages in the village of New Berlin would be reduced, the resulting protection is not at the level desired. The erosion rates would be within the limits allowable for the proposed land use.

The adoption of the land treatment alternative alone would preclude the following impacts of the selected alternative:

1. Construction of structural measures and project development will eliminate 51 acres of cropland, 118 acres of pasture, and 19 acres of forest land.

2. Permanent pools of the two reservoirs will have a mean lake evaporation rate of 119 acre-feet per year.

3. Noise and dust pollution will increase during construction.

4. Inconvenience of detours will be required.

5. Short term increase in sediment downstream may occur as a result of runoff during construction.

6. Installation of the reinforced concrete conduit will foreclose any opportunity to develop potential aquatic and associated resources which could be provided in direct utilization and intangible aesthetic values of the stream.

7. Eight hundred feet of natural stream channel will be eliminated by construction of the structures.

8. Thirty-two hundred feet of natural channel will be permanently inundated due to the pools of the structures.

9. Occasional short term inundation of 2,450 feet of natural stream channel will occur in the floodwater retarding pools of the structues.

10. Habitat for an estimated 17 rabbits, 25 squirrels, some browse for deer, and an unknown number of songbirds will be eliminated.

11. One family will be required to relocate due to the project development.

12. Construction of the project will remove 168 acres of land from the Chenango County tax roll.

13. Vehicular traffic and road maintenance will be increased.

Land Treatment and Floodproofing

This alternative includes installation of land treatment measures and floodproofing (24).

Land treatment would be the same as that described under the "Land Treatment Alternative" and the same costs and effects would be applicable.

Floodproofing of 21 flood plain residences and 19 businesses, including the New Berlin Library, would be required. Each residence would be evaluated by a technical team to determine its structural stability and the revisions and measures necessary to ensure its integrity during the onslaught of floodwaters from a 100-year frequency storm. It is estimated that nine business places, lacking structural integrity, would be removed from the flood plain. Raising of houses, reinforcement of walls and foundations; installing cellar drain valves; sealing of walls, windows and floors, and similar measures would cost an average of $10,000 per residence and $20,000 per business. Estimated cost of floodproofing would be about $410,000. Total installation cost would be about $450,000.

Implementation of this alternative would result in the following impacts:

1. Flood damages to residential and commercial properties from floods up to the magnitude of the 100-year frequency event would be eliminated in the village of New Berlin.

2. Direct beneficiaries include about 80 residents and owners, operators, and employees of 19 businesses.

3. Average annual sediment yields at the mouth of the watershed would be reduced by approximately 20 tons.

4. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved, and forest stands would be improved.

5. Fifteen acres of open land would be planted to trees during the project installation period.

6. The floodproofing of existing structures would disrupt schedules and budgets of the homeowners and businesses, and cause other inconveniences during the construction period. Neighborhood activities and local peace and tranquility would be disturbed.

7. Should any residences be removed from the flood plain, the owners and the neighbors in both the gaining and losing neighborhoods would experience psychological readjustments. The owners would incur personal expenses during the move and financial losses could result from the move.

8. Future flood plain improvements would be restricted to those which would neither be susceptible to flood damage nor contribute to the flooding problem.

This alternative would not meet the Sponsors' objectives. Although damage to businesses and residences would be eliminated there would be no reduction in stream channel and bridge cleanout cost. This alternative would not meet the water based recreational needs of the area.

The adoption of this alternative would preclude the impacts of the selected alternative as described in the "Land Treatment Alternative" section.

Land Treatment and Reinforced Concrete Channel

This alternative would consist of the described land treatment measures and approximately 2,000 feet of reinforced concrete channel, 10 feet wide by eight feet deep. Construction of this alternative would require the relocation of three businesses and the alteration of three streets and bridges. The channel would be concrete lined to provide stability with sidewalls extended to provide capacity for the 100-year discharge. Estimated project installation cost of this alternative, which provides for urban flood protection and land treatment, is $1,706,000.

Dikes and levees in lieu of, or as a supplement to, this alternative have several limiting engineering features. The rights-of-way would require the relocation of several houses as well as additional alterations to the described businesses and roads. Due to the unstable channel condition and the high velocities the channel would have to be constructed of reinforced concrete with rock riprap located along the dikes. The estimated cost would be greater than with the reinforced concrete channel alone.

The costs and effects of the land treatment measures of this alternative would be the same as that discussed under the "Land Treatment Alternative" section. Additional impacts of this alternative are as follows:

1. Urban flood damage from floods up to the magnitude of the 100-year frequency event would be eliminated in the village of New Berlin.

2. Direct beneficiaries include about 80 residents and owners, operators, and employees of 16 businesses.

3. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved and forest stands would be improved.

4. Construction of structural measures would result in approximately 40 man-years of employment, while project operation and maintenance would create approximately 0.3 man-years of employment annually.

5. Streambank erosion, contributing an estimated sediment yield of 30 tons per year, would be eliminated.

6. Three businesses would be relocated.

7. Reconstruction of streets and bridges would require the need for detours around construction areas. Inconveniences of noise and dust pollution from construction equipment would occur.

Selection of this alternative would provide for flood protection but would not meet the water based recreational needs of the area. The adoption of this alternative would preclude the impacts of the floodwater retarding structure and multiple purpose structure described in the proposed plan.

Land Treatment, One Floodwater Retarding Structure, One Multiple-Purpose Structure, and a Public Recreation and Fish and Wildlife Development

This alternative consists of land treatment, a single purpose floodwater retarding structure, a multiple-purpose structure, and a public recreational and fish and wildlife development. The land treatment would be the same as that discussed under "Land Treatment Alternative" and costs as shown would apply. Estimated project installation cost of this alternative is about $1,289,000.

Implementation of this alternative would result in the following impacts:

1. Urban flood damage from floods up to the magnitude of the 100-year frequency event would be eliminated in the village of New Berlin.

2. Direct beneficiaries include about 80 residents and owners, operators, and employees of 19 businesses.

3. Average annual sediment yields at the mouth of the watershed would be reduced by approximately 270 tons.

4. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved and forest stands would be improved.

5. A 50-acre lake would be created which would provide habitat for trout, waterfowl, and songbirds.

6. Construction of structure No. 1 would increase the streams present carrying capacity for trout by creating a one-acre pool, 10 feet deep.

7. Establishing a permanent cover of grass and legumes following construction would increase the quality of summer forage for deer and rabbits of adjacent habitat.

8. Changed land use would reduce the application of agri-nutrients above the project development.

9. Removal of one farmstead would eliminate a potential source of animal pollution.

10. Fifteen acres of open land would be planted to trees during the project installation period.

11. Creation of the 50-acre lake and the recreational and fish and wildlife development would provide for 39,667 annual recreation visits.

12. Construction of structural measures would result in approximately 250 man-years of employment, while project operation and maintenance would create approximately 3.0 man-years of employment annually.

13. Approximately 1.6 miles of lake shoreline would be created.

The sponsors' objective of reducing stream channel and bridge cleanout costs in the village of New Berlin would not be met with this alternative. The existing channel would continue to contribute an estimated 30 tons of sediment per year to the stream.

The adoption of this alternative would preclude the following impact of the selected alternative:

Installation of the reinforced concrete conduit will foreclose any opportunity to develop potential aquatic and associated resources which could be provided in direct utilization and intangible aesthetic values of the stream.

No Project Alternative

The "do nothing" approach would not make any changes in the existing environment. The watershed would remain essentially as outlined in the "Watershed Resources - Environmental Setting" section of this report. It would still be plagued with the problems which led to the

initiation of this project; however, the Soil Conservation Service's ongoing programs would continue. Both the adverse and favorable effects of the selected project measures would be eliminated. Flood damage reduction, recreation and fish and wildlife, and secondary benefits, would be foregone. Net average annual monetary benefits foregone would total $35,400.

REASON FOR SELECTING PLANNED PROJECT

The project, as formulated, consists of planned land treatment, one floodwater retarding structure, one multiple-purpose structure, a recreational and fish and wildlife development and approximately 0.25 miles of channel modification. Installation of this alternative will meet project Sponsors' objectives by eliminating flood damage in the village of New Berlin, up to the 100-year frequency event; reduce channel maintenance costs; and provide for water based recreation.

WORKS OF IMPROVEMENT TO BE INSTALLED

LAND TREATMENT

The land treatment phase of the plan includes technical assistance and measure installation and applies to each acre in the watershed. The land treatment phase includes continuation of the ongoing technical assistance and measure installation at a rate in existence prior to the formulation of this plan and accelerated technical assistance and measure installation required to meet project objectives. Technical assistance, going and accelerated, will be used to review, revise, and update existing conservation and woodland plans, to develop new plans where needed, for soil surveys, resource inventories and for installation of measures. Technical assistance will thus be applicable to any acre in the watershed. Measure installation will be on those acres which require treatment for adequate protection and for changes in use.

Through consensus of the conservation district, community leaders, landowners, and state and federal agencies, it was agreed that adequate land treatment should be applied to 250 acres of cropland, 300 acres of pastureland, 323 acres of forest land, and 50 acres of urban and other land during the 5-year installation period (Table 1). It was also agreed that 36 acres of capability class VIIs pastureland would have an adjustment in land use. Table N indicates planned types of land treatment measures to be applied.

Wildlife habitat management practices will be interspersed throughout the watershed. These practices will include planting grasses, legumes, and shrubs; constructing watering facilities; and managing valuable wildlife food plants.

TABLE N - LAND TREATMENT INSTALLATION

Land Use	Acres Needing Treatment	Land Treatment to be Applied 1/
Cropland	250	Conservation cropping system Contour Farming Diversion Pasture and Hayland Management Pasture and Hayland Planting Stripcropping Subsurface Drain
Pastureland	300	Brush Management Pasture and Hayland Management Pasture and Hayland Planting Pond Proper Grazing Use Trough or Tank
Forest Land	323	Hydrologic Cultural Operations Tree Planting Woodland Grazing Control Forest Management
Other	50	Fishpond Management Hedgerow Planting Pond Wildlife Wetland Habitat Management Wildlife Upland Habitat Management

1/ Definitions of land treatment measures in Appendix B.

STRUCTURAL MEASURES

Structural measures included in this plan are one floodwater retarding structure, one multiple-purpose structure, one public recreational and fish and wildlife development, and approximately 0.25 mile of channel work. The two structures will control 3.44 square miles of drainage area which is approximately 76 percent of the total watershed area. The design life for all structural measures is 100 years.

Structure No. 1

Floodwater retarding structure No. 1, with a drainage area of 2.09 square miles, is located on the north tributary just east of the Sherburne Turnpike. (See Appendix A, Project Map.)

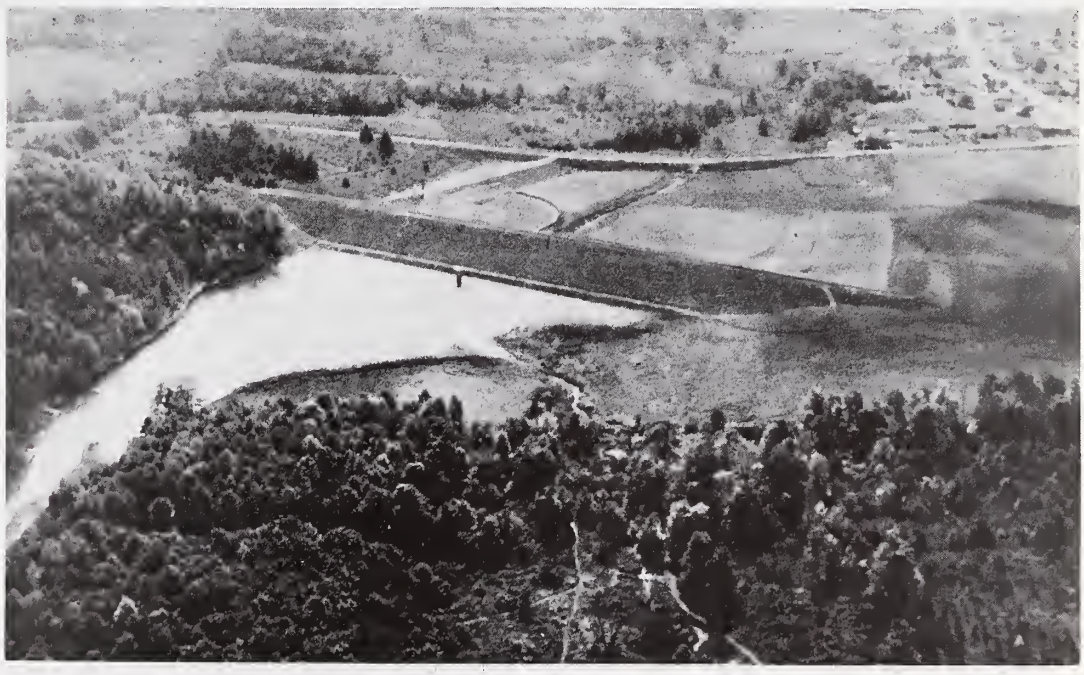


FIGURE 8 - TYPICAL FLOODWATER RETARDING STRUCTURE

The earth fill dam is a 58-foot high structure with a two-stage reinforced concrete drop inlet principal spillway with an energy dissipator and a vegetated earth emergency spillway. (See Table 3 for Structural Data.)

Flow will be controlled through an ungated reinforced concrete conduit, which incorporates a two-stage principal spillway system that controls runoff resulting from storms up to the 100-year frequency flood event. Flow resulting from storms greater than the 100-year frequency event will be routed safely around the dam through the emergency spillway. (See Appendix A, Typical Cross Section of Floodwater Retarding Structure.)

The structure will provide capacity for a total of 3 acre-feet of submerged sediment, and 276 acre-feet of floodwater storage (2.47 inches). The floodwater detention storage will empty in less than 4 days after passage of the design storm.

The foundation for the structure is stable bedrock, consisting of sandstone and shale. Geologic investigations made at the site indicate that a cutoff trench 10 feet deep will contact rock. The emergency spillway is located on the right abutment and was designed to permit a velocity of 8.6 feet per second through the spillway during the passage of the peak of the emergency spillway design storm. The material excavated from the emergency spillway is glacial till (GC, GC-GM) (30) and is suitable for use as earth fill for the dam. Additional earth fill (glacial till) for the dam is available on the right abutment, downstream from the emergency spillway area.

The foundation has no critical earthquake hazards. The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards of the structure.

Minimum land area required will include 17 acres for the temporary flood pool, one acre for sediment storage, 8 acres for the embankment, emergency spillway, outlet channel and access areas, and 10 acres for the borrow area. For inventories of present land use see Figure 5, and for future land use and land use changes, see Figure 10.

The sediment pool surface area will be approximately one acre and have a maximum initial depth of 10 feet. This area will gradually decrease as sediment accumulates over the life of the project. The flood pool area will be subject to short term temporary flooding and will experience normal vegetation successional trends over the life of the project. The access road and temporary construction area will be used intensively over the installation period, and all disturbed areas will then be seeded to desirable grasses and legumes. Public access to these areas will be discouraged by fencing to prevent damage during the vegetation establishment period.

Structure No. 2

Multiple-purpose structure No. 2, controlling a drainage area of 1.35 square miles, is located on the south tributary (Appendix A, Project Map).

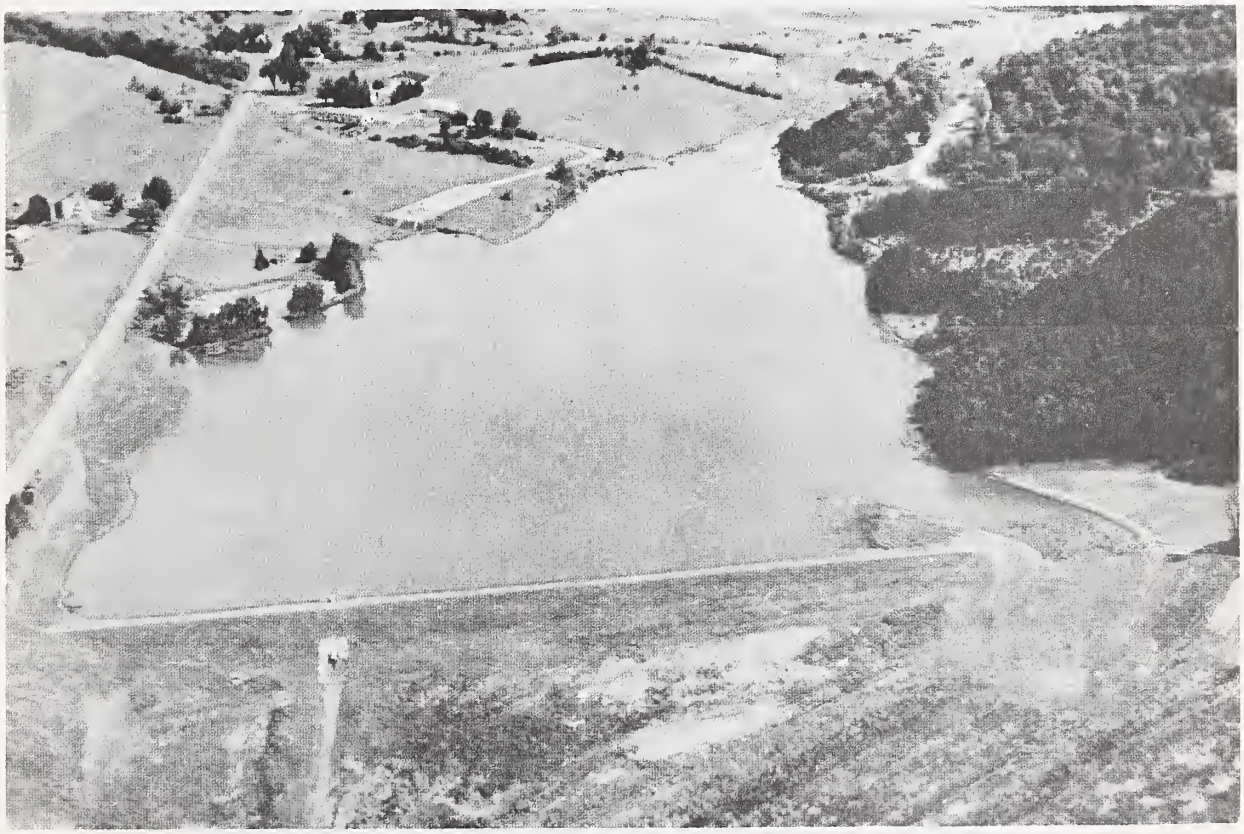


FIGURE 9 - TYPICAL MULTIPLE-PURPOSE STRUCTURE

This structure is planned as an 82-foot high earth fill dam which has a single-stage reinforced concrete drop inlet principal spillway, with an energy dissipater, and a vegetated earth emergency spillway. The structure will be fenced to prevent damage during the vegetation establishment period. The structure will provide storage for 21 acre-feet of submerged sediment, 2 acre-feet of aerated sediment, 797 acre-feet of recreational and fish and wildlife water, and 175 acre-feet (2.34 inches) of floodwater. It has a maximum release rate of 90 cfs and will empty the flood storage in less than 5 days. See Appendix A, Typical Cross Section of a Multiple-Purpose Structure.

Geologic investigations made at this site indicate the presence of a stable bedrock foundation consisting of sandstone and shale. A 24-inch pipe will be used for the principal spillway. The emergency spillway is located on the right abutment and was designed to pass the peak emergency spillway design discharge at a velocity of 7.6 feet per second. The material excavated from the emergency spillway is glacial till (GM) (30) and is suitable for use as earth fill for the dam. Additional earth fill (glacial till) for the dam is available upstream from the right abutment.

The foundation has no critical earthquake hazards. The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards of the structure.

Minimum land area required for this site includes 16 acres for construction of the dam, spillway, and outlet channel; 50 acres for the recreation and fish and wildlife pool, 6 acres for the temporary flood pool; and 18 acres for public access. This land will be acquired by fee title, 12 acres of which will be donated by the town of New Berlin. For inventories of present land use see Figure 6, and for future land use and land use changes see Figure 12.

The flood pool area will be subject to short term temporary flooding and will experience normal vegetation successional trends over the life of the project. The access road and temporary construction area will be used intensively over the installation period, and all disturbed areas will then be seeded to desirable grasses and legumes.

Public Recreational and Fish and Wildlife Development

The public recreational and fish and wildlife development (Appendix A - Recreational and Fish and Wildlife Development Map) will provide facilities for fishing, swimming, picnicking, field games, hiking, and nature studies. The facilities are designed to handle 440 swimmers and 400 picnickers during the normal heavy use season (Daily Design Capacity).

The development will contain approximately 2,750 feet of two-way oil and stone roads and 2,000 feet of one-way gravel interior service roads.

The oil and stone parking lot will handle 92 cars and 10 cars with boat trailers. Six-inch pressure-treated wood guideposts around the outside of the parking lot, and concrete bumper stops in the center, will be used to control traffic. Picnic facilities will include an open-sided pavilion type shelter, with a concrete floor and asphalt shingle roof; 40 tables; 20 cast iron charcoal grills, with concrete bases; and 14 garbage can stands, which will be pressure-treated wood post construction in concrete bases. A one-half acre 6-inch deep sand beach (100' x 200') will be constructed with an additional 50-foot strip of sand in the wading area. A lifeguard tower, a float, and buoy lines, to delineate swimming areas, will be provided.

A bathhouse will be constructed to have separate facilities for each sex. Each facility will have 4 toilets, 2 lavatories, 2 change stalls and one shower. One toilet in each facility will be designed for use by the physically handicapped. The bathhouse will be concrete block, wood frame, construction with tile walls. Preliminary investigations have indicated there may be severe soil limitations for septic tank leach fields. A specially designed sewage disposal system may have to be designed and installed.

Water supply will be from a drilled well with water distributed through the picnic and beach area via buried plastic pipe. Drinking fountain and hydrant combinations will be chrome self-closing faucets, on pressure-treated wood posts, with a gravel drain pit.

A gravel boat launch ramp and boat loading area will be constructed.

Electricity will be supplied to the bathhouse. A floodlight will be provided at the entrance and at each parking lot. Swings, slide, and horseshoe pits will be installed. A hiking trail, which includes a foot bridge, will circle the reservoir. The general area will be smoothed and seeded leaving selected trees and shrubs. Shade trees will be planted in the picnic area, parking area, and along the entrance road. A screening hedge will be planted along the north boundary of the picnic area (Table 2B).

Landrights to a minimum of 90 acres will be needed for the development, and will be acquired in fee simple title. For inventories of present land use see Figure 6, and for future land use and land use changes see Figure 12.

All facilities will be designed and constructed to assure accessibility and usability by physically handicapped people in accordance with P.L. 90-480. The American Standards Specifications for making buildings and facilities accessible to, and usable by, the physically handicapped, will be used as guidelines. All sanitary and water supply facilities will be designed, installed, operated and maintained to comply with New York State Health Department regulations.

Investigations during planning revealed that installation of the public recreational and fish and wildlife development will require the removal of one set of farm dwellings and the relocation of one family. Approximately 2,850 feet of electrical powerline will be relocated.

Channel Work

The flow of Mill Brook will be picked up at the outlet of a rectangular culvert at Main Street and carried through a closed concrete transition section into a reinforced concrete pipe. This pipe will have a 6.5 foot inside diameter with a 6 foot designed flow depth (Table 3A). The flow will be on a uniform grade to an energy dissipating device before discharging into the Unadilla River.

Construction will take place within the existing channel, but easements will be required from adjacent property owners to provide access to the channel for construction and maintenance equipment. There are no relocations anticipated for the installation of the channel work. The village will maintain the existing culvert under Main Street to ensure present capacity. All existing bank protection upstream from Academy Street to Main Street (see Urban Flood Plain Map in Appendix A) will be removed as part of the general excavation required. Backfill around the conduit will be compacted, graded and seeded. Trees along the channel, not within the immediate construction area, will remain to maintain the natural scenic beauty of the residential area.

The soil survey indicates that the entire reach of Mill Brook planned for channel work lies in Chenango gravelly silt loam (GM, GP-GM) (30). This area is a glacial outwash terrace with some glacial till knobs interspersed through the outwash material. The channel bed consists of cobbles, flags, and gravel.

There is no evidence of bedrock or bedrock influence in the channel from the outlet of the present underground channel to the confluence with the Unadilla River. The outwash deposits in this section appear to be sufficiently coarse and of sufficient depth to withstand loading from the proposed concrete pipe and therefore differential settlement and/or consolidation should not be a problem.

Landrights required for channel installation will include permanent access easements on about one acre of land. Disturbances to backyards of homes will be limited to areas adjacent to the existing channel.

General

Contractors will be required to adhere to strict guidelines prepared for each contract for minimizing soil erosion, water, noise, and air pollution during construction. Borrow areas will be stripped only as they are ready for use. Measures, such as temporary diversions, sediment basins, temporary seedings, and mulching, will be used to

protect exposed areas until final seeding. Adherence to state and local health requirements will be required regarding disease vector control, noise, and air pollution. Suppressors will be used to keep dust within tolerable limits on haul roads. Pollution of surface areas or ground water by chemicals, fuel, lubricants, sewage, and other pollutants, will not be permitted. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable state and local laws.

There is no storage specifically provided in site No. 1 for recreational use. Adequate provisions will be made to exclude the public to prevent the creation of unsanitary conditions. If public use is allowed in the future the sponsors will provide adequate sanitary facilities to serve the use contemplated.

The outlet channels below the dams will be designed and constructed to insure stability for at least 100 feet downstream by the use of vegetation or riprap.

Requirements for safety and health in conformance with the Federal Construction Safety Act of 1969 (P.L. 91-54) will be included in each construction contract. Design and construction will comply with applicable state laws.

The plan has been coordinated with the Office of Parks and Recreation and New York State Division of Historic Preservation. Investigations indicate that installation of the project will not encroach on any known archeological values, any historic place, or any places planned for historic preservation. An archeological survey was completed in the summer of 1974 under the supervision of Professor Fred Plog, State University of New York at Binghamton. Their report is included as Appendix E in the Environmental Impact Statement. If artifacts or other items of archeological or historical significance are uncovered by the Soil Conservation Service, or brought to its attention by others during construction, the Office of Parks and Recreation and the National Park Service will be notified. Appropriate arrangements will be made for survey or salvage as needed. Construction will not continue until the survey and salvage are completed.

In compliance with Public Law 86-523, the Soil Conservation Service will notify the Secretary of the Interior of the intent to construct a dam creating a reservoir that exceeds 40 surface acres.

EXPLANATION OF INSTALLATION COSTS

The total installation cost of the works of improvement is estimated to be $1,688,500. Of this total, $1,290,700 will be paid by Public Law 566 funds and $397,800 by other funds. Total installation costs include $39,400 for establishing land treatment measures on private land and $1,649,100 for installing structural measures (Table 1).

Land treatment costs include P.L. 566 funds of $8,300 to provide accelerated technical assistance; state P.L. 566 matching funds of $500; regular SCS program funds of $3,500, and current cooperative federal-state forestry program funds of $1,000 for technical assistance to continue the going program; and costs of $26,600 for applying land treatment. Landowners and operators will apply land treatment with cost sharing assistance that may be available through local, state, or federal programs at the time of installation.

TABLE O - SCHEDULE OF OBLIGATIONS - LAND TREATMENT

(Dollars) 1/

Year	Public Law 566 Funds	Other Funds	Total
1	1,000	3,500	4,500
2	1,300	5,500	6,800
3	1,700	5,500	7,200
4	2,300	8,200	10,500
5	2,000	8,400	10,400
TOTAL	8,300	31,100	39,400

1/ Price base: 1974

The total installation cost of structural measures includes costs for construction, engineering services, relocation payments, project administration, and landrights. The cost for each major structural measure has been determined individually and is shown in Table 2 and 2B.

The floodwater retarding structure and the channel work serve the purpose of flood prevention. Their installation costs were allocated to that purpose. The recreational and fish and wildlife development facilities serve the purpose of recreation and fish and wildlife. Their installation costs were allocated to that purpose. The multiple-purpose structure serves the purposes of flood prevention, recreation, and fish and wildlife. Joint installation costs were

allocated to the purposes served by the "use of facilities method" based upon the capacity provided in the reservoir for each purpose. Accordingly, joint installation costs were allocated (19.8 percent) to flood prevention and (80.2 percent) to recreation and fish and wildlife. Costs for landrights and relocations for the multiple-purpose structure are a specific cost for recreation and fish and wildlife and are allocated to that purpose. The total installation cost for the multiple-purpose structure are allocated (19.8 percent) to flood prevention and (80.2 percent) to recreation and fish and wildlife. See Table 2A for a summary of allocated costs.

Construction costs include the estimated contract costs plus a contingency allowance of 12 percent. All costs are based on estimated quantities and current unit prices. The unit costs were obtained from actual bid prices for similar works constructed in the state and from costs submitted by material supply firms. Construction costs include such items as clearing, excavation, earthfill (including borrow areas), concrete pipe, concrete, fencing, and seeding of disturbed areas.

The construction cost for recreation and fish and wildlife facilities for the project development at site No. 2 were obtained from bids on similar projects and from the Department of Environmental Conservation, Division of Fish and Wildlife.

The construction cost, estimated to be $517,000, for the multiple-purpose structure will be provided from P.L. 566 funds (59.9 percent or about $309,700) and from other funds (40.1 percent or about $207,300).

P.L. 566 funds will bear all the construction costs for the single-purpose floodwater retarding structure ($274,000) and for the channel improvement ($308,000). P.L. 566 funds will bear up to 50 percent of the construction costs, estimated at $150,400, for the recreation and fish and wildlife facilities and other than P.L. 566 funds will bear the remaining costs.

Engineering services costs include the direct cost of engineers and other technicians for surveys, engineering and geologic investigations, design, and preparation of plans and specifications for structural measures, including the vegetative work associated therewith. P.L. 566 funds will bear 100 percent of the engineering services costs for the floodwater retarding structure ($36,000), multiple-purpose structure ($57,000), and the channel work ($40,000). Engineering services costs ($24,200 for an A&E contract) for the public recreational and fish and wildlife facilities will be borne 50 percent by P.L. 566 funds and 50 percent by other funds.

Relocation payments include moving and related expenses for a displaced person, business, or farm operation, as well as financial assistance for replacement housing for a displaced person who qualifies and whose dwelling is acquired because of the project. The cost of providing relocation payments is to be shared in the ratio of P.L. 566 funds and other funds to the total project, excluding relocation payment costs. Public Law 566 funds and other funds will pay 76.4 percent ($4,500) and 23.6 percent ($1,500) respectively.

Project administration costs ($157,800) include the costs incurred for layout, inspection, relocation assistance advisory services, administration of contracts, and other administrative and clerical services necessary to install the project. The Sponsoring Local Organization will bear the cost it incurs to administer construction contracts and for such inspection and other administrative services as it requires for installation of the project. The Service will bear the cost it incurs for layout, inspection, and for such other administrative, clerical, and other services it provides. Supervision and review costs are those costs directly related to the supervision and review of plans and design of the public recreational and fish and wildlife facilities and will be provided by the Service and the Sponsor.

Relocation assistance advisory services costs include such items as determination of needs, obtaining current pertinent information concerning housing programs and costs, developing and handing out brochures, assurance of replacement dwellings and assisting in getting established. Other administrative functions associated with relocation payments, to be provided as needed, includes such items as providing by first-class mail written notice of displacement and appropriate application forms to each displaced person, business or farm operation; assistance in filing applications; reviewing and taking action on applications for assistance; reviewing and processing grievances; and making relocation payments. Relocation assistance advisory services will be provided by the sponsors without P.L. 566 cost sharing. The Service and the Sponsors will each bear the costs of project administration it provides, estimated to be $134,900 and $22,900 respectively.

The cost of landrights includes all costs incurred in acquiring land, easements, and rights-of-way and all legal costs, including appraisals, associated with the purchase of landrights. Cost of acquiring about 168 acres of land, including one farmstead, and relocating about 2,850 feet of powerline, for the multiple-purpose structure and the recreational and fish and wildlife development, will be shared up to 50 percent by P.L. 566 funds, with remaining costs to be provided by other funds. All associated costs of these expenditures, such as legal fees

and surveys, and the cost of acquiring 12 acres of public land, will be provided by other than P.L. 566 funds. All landrights cost associated with the floodwater retarding structure and the channel work will be provided by other than P.L. 566 funds. The total estimated cost of landrights is $78,700. P.L. 566 funds will provide about $31,000 and other funds will provide about $47,700.

Estimated total P.L. 566 cost and other obligations, by fiscal year and during the project installation period are shown in Table P.

TABLE P - SCHEDULE OF OBLIGATIONS - STRUCTURAL MEASURES
1/
(Dollars)

Fiscal Year	Measures	P.L. 566 Funds	Department	Sponsoring Local Organ.	Total
First	Engineering Services				
	Structure No. 1	36,000	-	-	36,000
	Landrights				
	Structure No. 1	-	-	5,400	5,400
	Project Administration	5,000	-	2,000	7,000
First Year Total		41,000	-	7,400	48,400
Second	Engineering Services				
	Structure No. 2	57,000	-	-	57,000
	Landrights				
	Structure No. 2	31,000	37,300	-	68,300
	Relocation Assistance	4,500	1,500	-	6,000
	Construction				
	Structure No. 1	274,000	-	-	274,000
	Project Administration	39,300	2,000	3,100	44,400
Second Yr. Total		405,800	40,800	3,100	449,700
Third	Engineering Services				
	Channel	40,000	-	-	40,000
	Landrights - Channel	-	-	5,000	5,000
	Construction				
	Structure No. 2	209,700	140,300	-	350,000
	Project Administration	36,100	4,000	1,500	41,600
Third Yr. Total		285,800	144,300	6,500	436,600
Fourth	Engineering Services				
	Public Facilities	12,100	2,400	9,700	24,200
	Construction - Complete				
	Structure No. 2 and				
	Start Channel Work	308,000	67,000	-	375,000
	Project Administration	32,200	2,900	2,500	37,600
Fourth Yr. Total		352,300	72,300	12,200	436,800
Fifth	Construction - Complete				
	Channel and Install				
	Public Facilities	175,200	23,600	51,600	250,400
	Project Administration	22,300	3,000	1,900	27,200
Fifth Yr. Total		197,500	26,600	53,500	277,600
GRAND TOTAL		1,282,400	284,000	82,700	1,649,100

1/ Price base: 1974

EFFECTS OF WORKS OF IMPROVEMENT

FLOOD PREVENTION, EROSION AND SEDIMENT

The area within the village of New Berlin to be benefited by the installation of the combined program of land treatment and structural measures is delineated on the urban flood plain map (Appendix A). With the project installed, peak discharges will be reduced and flows up to the 100-year frequency discharge will be contained by the closed conduit channel. Comparison of present and future peak discharges for selected frequencies are listed in Table Q.

TABLE Q - WITHOUT AND WITH PROJECT CONDITIONS

	Without Project			With Project
Frequency	Discharge	Stage 1/	Urban Area Flooded	Discharge
(years)	(cfs)	(feet)	(Acres)	(cfs)
100	1680	2.7	13.1	620
50	1410	2.4	11.7	530
20	1090	1.7	9.1	420
10	860	1.2	6.1	330
5	640	0	0	250
2	380	0	0	140

1/ Stage above bankfull 1200 feet east of Main Street.

Floodwater damages to urban properties, streets and utilities, and streambank stabilization structures and indirect flood damages, from floods up to the magnitude of the 100-year frequency event, will be eliminated in New Berlin. It is estimated that if a storm of the magnitude which created the 1905 flood were to recur under project conditions, there would be no flooding in the village of New Berlin.

Structural measures and the project development will eliminate 51 acres of cropland which produce about $6,350 worth of crops annually, 118 acres of pasture which produce about $1,100 worth of forage annually, and 19 acres of forest land which produce about $100 worth of wood products annually. In addition, about 24 acres of pasture and 4 acres of forest land will sustain periodic damage from floodwater storage.

Streambank erosion, contributing an estimated sediment yield of 30 tons per year, will be eliminated. Average annual sediment yields at the mouth of the watershed will be reduced by approximately 300 tons per year. The remaining sediment concentration will be equivalent to less than 20 milligrams per liter.

Direct beneficiaries to the proposed project include about 80 residents, living in the present flood prone area, and owners, operators, and employees of the 19 businesses subject to flooding. Elimination of flooding on approximately 13 acres will allow continuation of present land use without the implementation of restrictive flood plain zoning as required by the National Flood Insurance Program. Flood reduction benefits will accrue indirectly to individuals in the surrounding area by eliminating the interruption of services and transportation.

Permanent pools of the two reservoirs will have a mean lake evaporation rate of 119 acre-feet per year. Normally if precipitation is higher than net evaporation, according to DeWiest (38), streamflow will increase by the construction of a reservoir. Average monthly evaporation rates are greatest during the months of May through September. However, average monthly precipitation for the same period is equal to or exceeds the average monthly evaporation. It is concluded that effects on streamflow and associated aquatic life will be insignificant.

It is recognized that the two constructed lakes will undergo evolutionary changes from the time of their creation. A very slow increase in growth of algae and other aquatic plants, over a long period of time, is a natural successional change called eutrophication. The Department of Environmental Conservation, Division of Fish and Wildlife, is aware of the phenomona of eutrophication and will manage the fishery resource accordingly.

Changed land use caused by project measures installation will reduce the application of agri-nutrients and other factors affecting water quality. Removal of one farmstead will eliminate a potential source of animal pollution above the multiple-purpose structure.

During the period of construction, there will be the normal inconveniences of noise and dust pollution from construction equipment and the need for detours around construction areas. A short term increase in sediment rate downstream may be observed as a result of runoff during construction.

FISH AND WILDLIFE AND RECREATION

Land use and wildlife habitat changes by the year 2000 directly attributable to structural measures is shown in Table R.

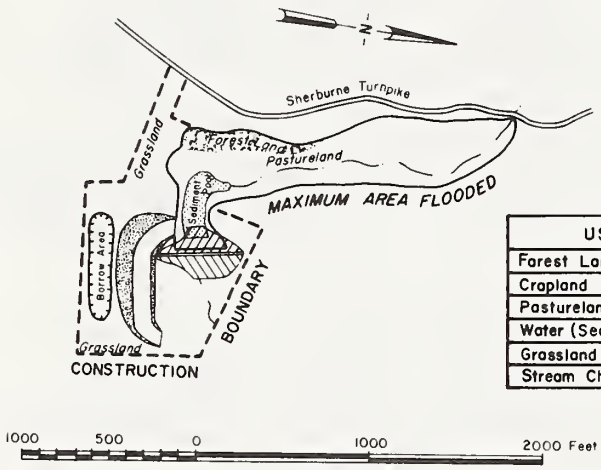
TABLE R - LAND USE AND WILDLIFE HABITAT CHANGE

	Without Project (acres)	With Project (acres)	Net Change (acres)	Wildlife Habitat
IMMEDIATE				
Cropland	662	611	- 51	Open Land
Pastureland	980	857	-123	Open Land
Forest Land	1,240	1,220	- 20	Forest Land
Urban & Other Land	78	272	+194	
			(51)	1/ Wetland
			(58)	2/ Open Land and Wetland
			(20)	3/ Open Land
			(65)	4/ Open Land
YEAR 2000				
Cropland	572	521	- 51	Open Land
Pastureland	963	840	-123	Open Land
Forest Land	1,295	1,340	+ 45	Forest Land
Urban & Other Land	130	259	+129	
			(51)	1/ Wetland
			(58)	2/ Open Land and Wetland
			(20)	3/ Open Land

1/ Sites 1 and 2 - Permanent water
2/ Maintained grasses and legumes
3/ Recreational and Fish and Wildlife facilities
4/ Will change from open land to forest land habitat through plant succession

The installation of channel work will change 1,318 feet (.25 miles) of open modified channel, which does not support a fishery, to a reinforced concrete conduit. This will limit any opportunity to develop potential aquatic and associated resources which could be provided by direct utilization and intangible aesthetic values of the stream. No land use or wildlife habitat changes will occur on the one acre of urban land.

The construction area required for structure No. 1 will eliminate five acres of forest land and three acres of brushy pasture (Figure 10- Post Construction Wildlife Habitat Map - Site No. 1). One acre of forest land will be cleared for the sediment pool and 10 acres of cropland will be required for borrow. Seeding of the construction and borrow areas with a mixture of perennial grasses and legumes will provide some food for rabbits and nesting cover for songbirds. Habitat eliminated during construction will displace about 5 rabbits and an unknown number of songbirds.



	PRESENT	WITH PROJECT	
USE	AMOUNT	AMOUNT	CHANGE
Forest Land	9 Acres	3 Acres	-6 Acres
Cropland	10 Acres	0	-10 Acres
Pastureland	17 Acres	14 Acres	-3 Acres
Water (Sediment Pool)	0	1 Acre	+1 Acre
Grassland	0	18 Acres	+18 Acres
Stream Channel	2850 Feet	2050 Feet	-800 Feet

FIGURE 10 - SITE 1 - POST CONSTRUCTION WILDLIFE HABITAT

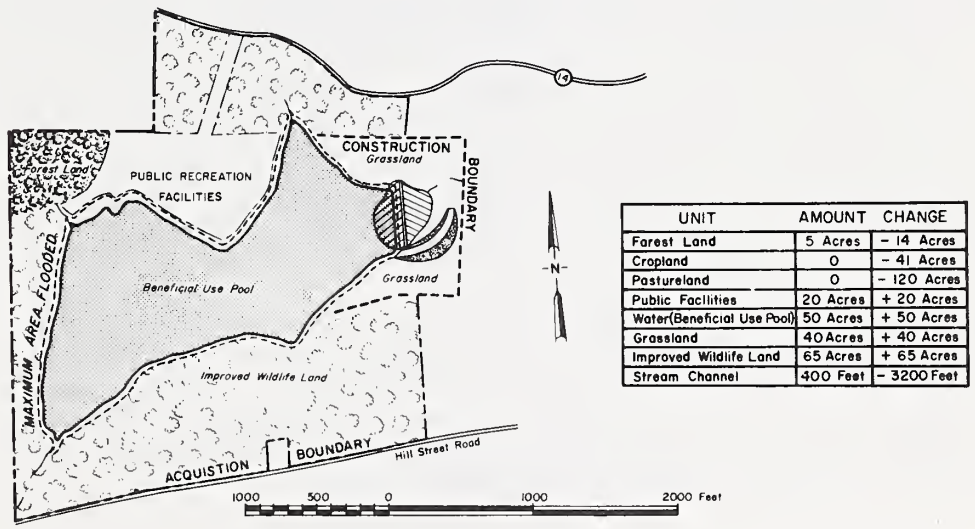
Floodwater will occasionally inundate three acres of forest land and 14 acres of pastureland. The construction of structure No. 1 will increase the stream's present carrying capacity for trout by creating a one-acre pool, 10 feet deep. This will gradually decrease in size as it fills with sediment, over the life of the project.

Construction of the multiple-purpose structure will create a 50-acre lake which, with its environs, will provide habitat for trout, waterfowl, songbirds, and other wildlife. Fifteen acres of the lake

will be between 20 and 65 feet deep, 15 acres will be 10 to 20 feet deep, and approximately 20 acres will be less than 10 feet deep. The permanent pool will inundate approximately one acre of cropland, five acres of forest land, and 44 acres of brushy pasture.

The construction area will convert eight acres of forest land and eight acres of brushy pasture to maintained grasses and legumes. About 24 acres of land will be occasionally inundated. This includes one acre of forest land, five acres of cropland, and 18 acres of pastureland. The cropland and pastureland will convert to forest land under future conditions.

The construction of this site will eliminate habitat for an estimated 12 rabbits, 25 squirrels, some browse for deer and an unknown number of songbirds. Establishing a permanent cover of grass and legumes following construction will increase the quality of summer forage for deer and rabbits of adjacent habitat. This cover will also replace habitat for some species of ground nesting songbirds and create a feeding and nesting area for waterfowl associated with the permanent pool.



UNIT	AMOUNT	CHANGE
Forest Land	5 Acres	- 14 Acres
Cropland	0	- 41 Acres
Pastureland	0	- 120 Acres
Public Facilities	20 Acres	+ 20 Acres
Water(Beneficial Use Pool)	50 Acres	+ 50 Acres
Grassland	40 Acres	+ 40 Acres
Improved Wildlife Land	65 Acres	+ 65 Acres
Stream Channel	400 Feet	- 3200 Feet

FIGURE 11 - SITE 2 - POST CONSTRUCTION WILDLIFE HABITAT

Land use, on the additional 90 acres of land involved with the recreational and fish and wildlife development, will change from 35 acres of cropland, 50 acres of pasture and five acres of forest to 70 acres of forest and 20 acres of other (recreational and fish and wildlife facilities) during the project life.

Approximately 4,000 feet of natural stream channel will be altered by the construction of the two floodwater retarding structures. The dams will eliminate 800 feet, and the sediment pool of site No. 1 and beneficial use pool of site No. 2 will permanently inundate 300 feet and 2,900 feet of channel respectively. Occasional, short-term inundation of 2,450 feet of natural channel will occur in the flood retarding pools of the sites.

Degradation of natural stream channel below the structures will occur. Van Kirk (36) reports that when floodwaters are impounded behind a dam the stream below the dam cuts the stream channel wider and slightly deeper. This condition results in greater meandering of the stream. The channel will be protected for about 100 feet below each dam to alleviate this condition.

During construction of the structures, there will be an increase in the sediment load of Mill Brook below the sites. Van Kirk (36), however, found that in a test stream these sediments had no effect on bottom fauna and most were removed by high water.

The flooding within the flood pools may drown nestlings and fresh forage may become mud covered, Hendrickson (12). Inundation of the flood pools will normally occur in late March and early April. This is before most ground nesting species of wildlife begin to nest or lay eggs. Many moles, mice, woodchucks, rabbits and other such mammals will move to higher ground as the water level rises.

The recreational and fish and wildlife development will provide 39,667 recreation visits annually. A recreation visit is defined as a visit by one person to the site during a day, regardless of how long he stays or in what kind of activity he may participate. Activities available for recreationists will include swimming, picnicking, fishing, hiking, and nature study.

ECONOMIC AND SOCIAL

Labor necessary for construction of the project will result in approximately 31 man-years of labor, while project operation and maintenance will create opportunity for approximately 3.5 man-years of employment per year. Induced secondary sales, stemming from the recreational and fish and wildlife development, will produce seasonal employment estimated at 1.5 man-years per year. Increased sales and employment will generate a slight rise in per capita income of the watershed.

The family which will be relocated is currently occupying an adequate, safe, and sanitary dwelling. They will be provided the opportunity to obtain equivalent housing and will be reimbursed for reasonable relocation cost.

Public ownership of the 168 acres of private land, to be purchased, will reduce the tax base. Operation and maintenance of the structural measures will cost an average of $17,800 per year. These monies will have to be raised via taxes or by charging user fees as mutually agreed to by the Sponsoring Local Organizations and the Service.

Increased traffic is anticipated in the vicinity of the recreational and fish and wildlife development with resultant increases in pollution (noise, exhaust fumes, litter, etc.). The county will bear the costs of controlling the additional traffic in the area.

PROJECT BENEFITS

Average annual flood damage reduction benefits are estimated at $62,220 (Table 5). Urban damages will be reduced by $28,420; streets and utilities damage by $2,090; streambank stabilization structures damage by $23,590, and indirect flood damages by $8,120. The installation of planned land treatment measures will provide flood damage reduction benefits, amounting to $860 annually, which were not used for project justification.

Total structural measure benefits of $165,700, including flood damage reduction benefits of $61,360, recreational and fish and wildlife benefits of $89,240, and secondary benefits of $15,100, are anticipated (Table 6). Average annual cost of the project is estimated at $131,400. Secondary benefits from a national viewpoint were not considered pertinent to the economic evaluation.

COMPARISON OF BENEFITS AND COSTS

The average annual cost of the structural measures is estimated to be $131,400. These measures are expected to produce average annual benefits, excluding secondary benefits, of $150,600 or $1.16 for each dollar of cost. The ratio of the total average annual project benefits ($165,700) to the average annual cost of structural measures ($131,400) is 1.3 to 1.0. Table 6 shows a summary of benefits, costs, and the benefit to cost ratio.

PROJECT INSTALLATION

Under the provisions of Article 5, Section 223, of the County Law of the State of New York and Public Law 566, Chenango County is eligible to receive federal assistance for installation of works of improvement. The county has the authority and will be responsible for obtaining all necessary land, easements, and rights-of-way; to contract for construction; to operate and maintain structural measures; to make assessments against real estate parcels in proportion to benefits received; and to accept donations, gifts and grants.

Responsibilities for installing works of improvement are as follows: The Chenango County Board of Supervisors will:

1. Provide for the administration of construction contracts for the single purpose floodwater retarding structure, channel work and the recreational and fish and wildlife facilities. Provide for such inspection and other administrative services and costs for these services, as it requires for the installation of the project. They may, at a later date, request the Service to administer contracts.

2. Provide the necessary land, easements, and rights-of-way for all structural measures. They will obtain landrights through condemnation, if necessary. Appraisals will be obtained as a prerequisite to securing landrights in accordance with provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894). Prior to initiation of negotiations, an appraisal of the fair market value of the real property interest to be acquired will be made by a qualified land appraiser. The owner or his designated representative will be given a reasonable opportunity to accompany the appraiser during his inspection of the property. Any decrease or increase in the fair market value of the property, prior to the date of the appraisal, which is caused by the public improvement for which the property is acquired or by the likelihood that the property would be acquired for such improvement, other than due to physical deterioration within the reasonable control of the owner, will be disregarded in appraising the property. Where appropriate the estimate of the fair market value of the property to be acquired and the estimate of damages or offsetting benefits to the remaining property will be separately stated.

The county will provide relocation assistance advisory services to include providing current and continuing information on the availability, prices, and rentals, of comparable decent, safe, and sanitary sales and rental housing; supply information concerning federal and state housing programs, disaster loan programs, and other federal or state programs offering assistance to displaced persons; and provide other advisory services to displaced persons in order to minimize hardships to such persons in adjusting to relocation.

As a part of project administration, the county will provide personally or by certified or registered first class mail, written notice of displacement, at least 90 days before they have to move, and appropriate application forms to each individual, family, business or farm operation to be displaced; assist in filing applications, review and take action on applications for relocation assistance; review and process grievances in connection with displacements; and make relocation payments. The Service will assist in fulfilling these responsibilities.

3. Provide its share of project installation cost at the time and in the amounts required.

The New York State Department of Environmental Conservation is authorized by Part XII of the Conservation Law, Section 360, Subdivision 1, Paragraph (d), to enter into cooperative agreement with the United States Government. Under this authority, the Department will:

1. Provide for the administration of construction contracts for multiple-purpose structure No. 2. Provide for such inspection and other administrative services and costs for those services, as it requires for the installation of the project. The Department may, at a later date, request the Service to administer contracts.

2. Provide its share of project installation cost at the time and in the amount required.

The village of New Berlin will:

1. Grant permits needed for underpinning Academy Street bridge.

2. Provide for such inspection and other administrative services, and costs for those services, as it requires for the installation of the project.

3. Provide its share of project installation cost at the time and in the amounts required.

The Soil Conservation Service will:

1. Under the District's Memorandum of Understanding with the U. S. Department of Agriculture, provide technical assistance for planning, installing, and maintaining conservation measures.

2. Provide for engineering services for surveys, investigations, design and preparation of plans and specifications for structural measures, including the vegetative work associated therewith, for multiple-purpose structure No. 2, floodwater retarding structure No. 1, and the channel work.

3. Provide for project administration services which it incurs, including a government representative to administer the expenditure of federal funds and ensure that all structural measures are installed in accordance with plans and specifications.

4. Provide its share of project installation cost at the time and in the amount required.

The U. S. Forest Service will:

Provide guidance and direction to the New York State Department of Environmental Conservation, Division of Lands and Forests for implementation of the proposed forestry program.

The New York State Department of Environmental Conservation, Division of Lands and Forests will:

In cooperation with the U. S. Forest Service, furnish technical assistance to landowners and others for the determination of needed practices and installation of forest treatment measures.

The Chenango County Soil and Water Conservation District will:

Determine priorities and coordinate technical assistance to plan and install the land treatment.

The Cooperative Federal-State Extension Service, through their agents and specialists, will be requested to furnish assistance in developing and carrying out the watershed information and education program. The cooperation of lending agencies, such as local banks, the Farmers Home Administration, the Production Credit Association, and the Federal Land Bank, will be requested to provide loans to help cooperating landowners and operators install needed treatment measures.

The land treatment measures will be installed at an approximate uniform rate over the 5-year installation period of the project. Similar measures required to meet the total conservation needs will continue to be installed thereafter.

The structural measures are evaluated as a single unit. All structural measures operate jointly in achieving project objectives. Sites No. 1 and 2 should be completed before construction of downstream channel improvement is started. Landrights will be obtained within the first three years of the installation period and funds will be available from the local organizations in accordance with Table P - Schedule of Obligations - Structural Measures.

FINANCING PROJECT INSTALLATION

Federal assistance, financial and other, to be furnished by the Soil Conservation Service in carrying out the project, is contingent on the appropriation of funds for this purpose. Public Law 566 financial assistance will be provided only under appropriate agreements executed by the Sponsoring Local Organization and the Soil Conservation Service which include:

1. A Project Agreement which provides for the installation of works of improvement.

2. An Agreement for Engineering Services performed by the contracting local organization.

3. A Relocation Agreement which provides for furnishing authorized benefits to displaced persons.

4. A Landrights Agreement which provides for cost shared landrights.

5. An Operation and Maintenance Agreement which provides for the operation and maintenance of the works of improvement. This agreement will require special agreements with secondary recipients (such as concessionaires) which will include a provision that facilities be operated in accordance with the Civil Rights Act of 1964.

Technical assistance funds for forestry activities will be provided through the going program of the U.S. Forest Service and the Forest Practice Act Program of the New York State Department of Environmental Conservation.

The Chenango County Agricultural Stabilization and Conservation Committee will provide cost sharing assistance to farmers in the watershed for installation of land treatment measures in accordance with the provisions of the program in effect at the time assistance is provided.

The Farmers Home Administration will give special consideration to eligible farm families in the way of credit and farm management guidance to establish the necessary land treatment measures and improve farm income. This assistance may vary over the years as the regulations pertaining to Farmers Home Administration loan programs are altered to meet the changing conditions.

Chenango County has legal authority to secure loans or other financing assistance and determine taxing rates for repayment of all county expenses incurred by the project. County financial obligations will be met through regular appropriations. Chenango County obligations include:

1. Necessary landrights costs for floodwater retarding structure No. 1 and for channel work.

2. Pay 30 percent of the cost for the access roads, service roads, guideposts, and parking lot; 50 percent of the cost for the pavilion, tile fields (septic fields), beach, wading area, picnic tables, charcoal grills, garbage can stands, lifeguard tower, float, swings, slides, ballfield backstop and horseshoe pits; and 40 percent of the cost for the construction of the bumper rails, bathhouse, septic tanks, and water supply.

3. Pay 40 percent of the cost for an A&E contract for design of the recreational and fish and wildlife facilities.

4. Project administration cost which it incurs.

The New York State Department of Environmental Conservation, Division of Fish and Wildlife financial and other assistance to the project is contingent on the appropriations of funds for these purposes. Department cost obligations include:

1. All of the local, or other than Public Law 566, construction costs for structural measures for multiple-purpose structure No. 2

2. Fifty percent of the costs for the construction of signs and chain gates for service roads, boat launch ramp and turnaround, shade trees, seeding, screening hedge, foot trail, and footbridge; 20 percent of the cost for the access roads, service roads, guidepost and parking lots; and 10 percent of the costs for construction of the parking lot bumper rails, bathhouse, septic tanks, and water supply.

3. Landrights costs needed for multiple-purpose structure No. 2 and the public development. Public Law 566 funds will reimburse the Department for up to 50 percent of the cost eligible for cost sharing, including cost of land appraisals. The Department will pay the entire cost of legal fees and other expenses incurred in the purchase of this land.

4. Provide 10 percent of the cost for an A&E contract for design of the recreational and fish and wildlife facilities.

5. Project administration cost which it incurs.

The village of New Berlin will meet its financial obligations through regular appropriations. Village financial obligations include project administration cost which it incurs.

Prior to entering into agreements that obligate funds of the Service, the Sponsoring Local Organizations will have a financial management system for control, accountability, and disclosure of P.L. 566 funds received, and for control and accountability for property and other assets purchased with P.L. 566 funds. Program income earned during the grant period will be reported on the sponsor's request for advance or reimbursement from the Service.

PROVISIONS FOR OPERATION AND MAINTENANCE

LAND TREATMENT MEASURES

Land treatment measures will be operated and maintained by the landowners and operators. Technical assistance will be provided by the Chenango County Soil and Water Conservation District and the New York State Division of Lands and Forests, subject to availability of resources.

STRUCTURAL MEASURES

Chenango County will operate and maintain structure No. 1, the Department (DEC) will operate and maintain structure No. 2, and the village of New Berlin will operate and maintain the channel work. The county will be permitted to operate and maintain the recreation facility and structure No. 2, under the jurisdiction of the Department.

Operation and maintenance of the channel will include minor works of improvement necessary to stabilize channel areas upstream of the proposed channel work. Maintenance will be provided on the total channel within the village limits to ensure its stability and existing capacity for the life of the project. This will include repairs and maintenance to the existing culvert under Main Street.

The county and village will utilize their existing labor and equipment resources or will furnish funds through regular appropriations to accomplish necessary operation and maintenance activities. Under current Department policy no user fees may be charged for use of the fish and wildlife resources. No user fees are contemplated for the recreation facilities, however, if at a later date Chenango County elects to charge user fees provisions must be made to allow for unrestricted use of the fish and wildlife resource with no charge to these users for items such as parking, boat launching, and sanitary facilities. The schedules of admission and use fees together with other requirements for operation and maintenance must be mutually agreed to by the Sponsoring Local Organizations and the Service and set forth in the Operation and Maintenance Agreement. Fees will be limited to produce revenues necessary only to amortize the initial investment and to provide for adequate operation and maintenance.

Total estimated annual cost of operation and maintenance of structural measures is $17,800. Estimated annual costs of maintenance of the channel is $1,000, including costs of debris removal and necessary repairs. Estimated annual costs of maintenance of structures No. 1 and No. 2 is $3,200. These costs include mowing of dams and spillways, cleaning trash racks, eliminating floating debris and any necessary repairs.

Estimated cost of operation, maintenance and replacement of the recreational and fish and wildlife facilities is $13,600 annually. These costs include garbage and trash collection, policing, mowing grass in the recreation and waterfowl area, trimming trees and shrubs, daily cleaning of sanitary facilities, general care, repair and replacement of equipment, roads, parking lots, and signs, and providing lifeguards. Operation and maintenance costs of the public development will be shared by the County

and the Department, estimated at $10,600 and $3,000 respectively. The Department's costs include an estimated $1,200 for stocking the multiple-purpose reservoir with approximately 4,000 trout annually. Operation of the development will comply with the requirements of state and local health agencies.

Water stored in the recreation and fish and wildlife pool should not be withdrawn and used for any other purpose. The Department will notify the Service, through the state conservationist, whenever the reservoir is operated below 1,452 feet m.s.l. elevation, except when this occurs through normal evaporation and seepage losses. If the Department allows the use of the recreation and fish and wildlife storage for municipal or industrial purposes, on a continuing basis, the Sponsoring Local Organization will reimburse the Federal Government for all P.L. 566 funds used for the public recreation and fish and wildlife costs associated with the reservoir.

The Sponsors and the Soil Conservation Service will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. They will jointly determine what maintenance measures are needed. These inspections will continue for three years following installation of the structure. Inspection after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service.

An establishment period of three years is provided for all structural works of improvement and associated vegetative cover. During this period, the Service may use P.L. 566 funds to cost share on any repairs or other work resulting from unknown conditions or deficiencies. The cost of repairs will be shared in the same ratio as the original structure.

Repairs or additional work not eligible for P.L. 566 financial assistance include maintenance work, and work resulting from improper operation and maintenance. However, the Service will provide technical assistance that may be needed in performing any of these tasks.

An operation and maintenance agreement between the Service and the Sponsors will be executed prior to the signing of a landrights or project agreement. An operation and maintenance plan will be prepared for each structure in accordance with guidelines outlined in the State of New York Watersheds Operation and Maintenance Handbook, published by the Soil Conservation Service.

The operation and maintenance agreement will include specific provisions for retention and disposal of property acquired or improved with P.L. 566 financial assistance.

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST

Mill Brook Watershed, New York

Installation Cost Item	Unit	Number	Estimated Cost (Dollars 1/						
			Public Law 566 Funds			Other Funds			TOTAL
			SCS 3/	FS 3/	Total	SCS 3/	FS 3/	Total	
LAND TREATMENT 2/									
Land Areas									
Cropland	Acres	250				9,200		9,200	9,200
Pastureland	Acres	300				13,300		13,300	13,300
Forest Land	Acres	323					3,000	3,000	3,000
Urban and Other Land	Acres	50				1,100		1,100	1,100
Technical Assistance			5,500	2,800	8,300	3,500	1,000	4,500	12,800
TOTAL LAND TREATMENT			5,500	2,800	8,300	27,100	4,000	31,100	39,400
STRUCTURAL MEASURES									
Construction									
Floodwater Retarding Structures	No.	1	274,000		274,000				274,000
Multiple Purpose Structures	No.	1	309,700		309,700	207,300		207,300	517,000
Public Fish and Wildlife and Recreational Development	No.	1	75,200		75,200	75,200		75,200	150,400
Channel Work 4/ (M)	Feet	1,318	308,000		308,000				308,000
Subtotal - Construction			966,900		966,900	282,500		282,500	1,249,400
Engineering Services			145,100		145,100	12,100		12,100	157,200
Relocation Payments			4,500		4,500	1,500		1,500	6,000
Project Administration									
Construction Inspection			67,000		67,000	1,900		1,900	68,900
Other			65,900		65,900	19,300		19,300	85,200
Supervision and Review 5/			2,000		2,000	500		500	2,500
Relocation Assistance Advisory Services						1,200		1,200	1,200
Subtotal - Administration			134,900		134,900	22,900		22,900	157,800
Other Costs									
Land Rights			31,000		31,000	47,700		47,700	78,700
TOTAL STRUCTURAL MEASURES			1,282,400		1,282,400	366,700		366,700	1,649,100
TOTAL PROJECT			1,287,900	2,800	1,290,700	393,800	4,000	397,800	1,688,500

1/ Price base 1974.
2/ Includes only areas estimated to be adequately treated during the project installation period. Dollar amounts apply to total land areas, not just to adequately treated areas.
3/ Federal agency responsible for assisting in installation of works of improvement.
4/ Type of channel prior to project: (M) - manmade ditch or previously modified channel.
5/ Supervision and review of A&E Contract for fish and wildlife and recreational facilities.

TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT

Mill Brook Watershed, New York

Measures	Unit	Applied to Date	Total Cost (Dollars) 1/
LAND TREATMENT			
Brush Control	Acres	32	1,120
Conservation Cropping Systems	Acres	250	- 2/
Contour Farming	Acres	25	-
Diversion	Feet	800	200
Pond	No.	2	1,700
Fishpond Management	No.	2	90
Hedgerow Planting	Feet	1,500	45
Pasture and Hayland Management	Acres	300	2,100
Pasture and Hayland Planting	Acres	220	13,200
Proper Grazing Use	Acres	200	-
Stripcropping	Acres	25	700
Tree Planting	Acres	52	2,075
Hydrologic Cultural Operations	Acres	40	800
Grazing Control (Fencing)	Miles	0.6	200
Grazing Control	Acres	24	-
Fire Control	Acres	1,240	1,240
TOTAL	:::::	:::::	23,470

1/ Costs at time of installation adjusted to 1974 prices.
2/ All measures having a dash (-) under Total Cost indicates no cost of installation by the landowners.

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TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION

Mill Brook Watershed, New York

(Dollars) 1/

Item	Installation Cost P.L. 566 Funds					Installation Cost - Other Funds					Total Installation Cost
	Construction	Engineering	Land Rights	Relocation Payments	Total P.L. 566	Construction	Engineering	Land Rights	Relocation Payments	Total Other	
Floodwater Retarding Structure No. 1	274,000	36,000	-	-	310,000	-	-	5,400	-	5,400	315,400
Channel Work (M) 3/	308,000	40,000	-	-	348,000	-	-	5,000	-	5,000	353,000
Multiple-Purpose Structure No. 2	309,700	57,000	12,000	-	378,700	207,300	-	12,100	-	219,400	598,100
Public Fish & Wildlife & Recreational Development	75,200	12,100 4/	19,000	4,500	110,800	75,200	12,100 4/	25,200 2/	1,500	114,000	224,800
Subtotal	966,900	145,100	31,000	4,500	1,147,500	282,500	12,100	47,700	1,500	343,800	1,491,300
Project Administration	XXXXXXX	XXXXXX	XXXXXX	XXXXX	134,900	XXXXXX	XXXX	XXXXXX	XXXXX	22,900	157,800
GRAND TOTAL	966,900	145,100	31,000	4,500	1,282,400	282,500	12,100	47,700	1,500	366,700	1,649,100

1/ Price base 1974.
2/ Includes $6,200 for legal fees.
3/ Type of channel prior to project: (M) - manmade ditch or previously modified channel.
4/ Engineering services contract cost.

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TABLE 2A - COST ALLOCATION AND COST SHARING SUMMARY

Mill Brook Watershed, New York

(Dollars) 1/

Item	COST ALLOCATION			COST SHARING					
	PURPOSE			P.L. 566			OTHER		
	Flood Prevention	Fish & Wildlife & Recreation	Total	Flood Prevention	Fish & Wildlife & Recreation	Total	Flood Prevention	Fish & Wildlife & Recreation	Total
Floodwater Retarding Structure No. 1	315,400	-	315,400	310,000	-	310,000	5,400	-	5,400
Channel Work	353,000	-	353,000	348,000	-	348,000	5,000	-	5,000
Multiple-Purpose Structure No. 2	113,700	484,400	598,100	113,700	265,000	378,700	-	219,400	219,400
Public Fish & Wildlife & Recreational Development	-	224,800	224,800	-	110,800	110,800	-	114,000	114,000
GRAND TOTAL	782,100	709,200	1,491,300	771,700	375,800	1,147,500	10,400	333,400	343,800

1/ Price base: 1974

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TABLE 2B - RECREATIONAL FACILITIES

ESTIMATED CONSTRUCTION COSTS

Mill Brook Watershed, New York
1/
(Dollars)

Item	Number 2/	Estimated Unit Cost	Total Construction Cost
Access Roads	2,750 ft.	10.55/LF	29,000
Service Roads	2,000 ft.	4.00/LF	8,000
Guide Posts	1,300	4.00/Ea.	5,200
Parking Lot (104 cars)	46,500 SF	0.45/SF	21,900
Signs and Chain Gates for Service Roads	Item	670/Ea.	670
Parking Lot Bumper Rails	900 ft.	1.25/LF	1,130
Boat Launch Ramp and Turnaround	Item	2,300/Ea.	2,300
Pavilion (Shelter)	50'x25'	8.00/SF	10,000
Bathhouse	25'x30'	36.70/SF	27,500
Septic Tanks (2,000 gal.)	2	1,000/Ea.	2,000
Tile Fields (Septic Fields)	2 (41'x66')	1,800/Ea.	3,600
Water Supply (Pump Pressure Tank, Pumphouse, Pipelines, and labor)	Item	11,600/Ea.	11,600
Shade Trees	50	75/ea.	3,750
Seeding	5 Ac.	500/Ac.	2,500
Beach (100'x200')	1	0.25/SF	5,000
Wading Area (50'x200')	1	0.25/SF	2,500
Picnic Tables	40	125/Ea.	5,000
Charcoal Grills (Cast Iron with Concrete Base)	20	80/Ea.	1,600
Garbage Can Stands (Post set in Concrete)	14	25/Ea.	350
Lifeguard Tower	1	Lump Sum	300
Float	1	Lump Sum	1,000
Swings, Slides, Ballfield Backstop, Horseshoe Pits	Item	1,500/Ea.	1,500
Screening Hedge	1,000 Ft.	1.00/LF	1,000
Hiking Trail	Item	1,000/Ea.	1,000
Foot Bridge	1	2,000/Ea.	2,000
GRAND TOTAL			150,400

1/ Price base: 1974
2/ Estimated quantity, subject to minor variation at time of detailed planning.

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TABLE 3 - STRUCTURAL DATA

STRUCTURES WITH PLANNED STORAGE CAPACITY

Mill Brook Watershed, New York

Item	Unit	Structure Number 1	Structure Number 2	
Class of Structure		c	c	
Drainage Area	Sq.Mi.	2.09	1.35	3.44
Curve No. (1-day) (AMC II)		71	78	
Tc	Hrs.	1.5	0.9	
Elevation Top of Dam	Ft.	1351.7	1463.3	
Elevation Crest Emergency Spillway 1/	Ft.	1342.7	1455.5	
Elevation Crest High Stage Inlet	Ft.	1340.7	1452.0	
Elevation Crest Low Stage Inlet	Ft.	1305.0	-	
Maximum Height of Dam	Ft.	58.0	82.0	
Volume of Fill	Cu.Yds.	103,800	220,000	323,800
Total Capacity 3/	Ac.Ft.	279	995	1274
Sediment Submerged (100 years)	Ac.Ft.	3	21	24
Sediment Aerated	Ac.Ft.	-	2	2
Beneficial Use (Fish & Wildlife)	Ac.Ft.	-	797	797
Retarding	Ac.Ft.	276	175	451
Between high and low stage	Ac.Ft.	240	-	
Surface Area				
Sediment Pool	Acres	1	3	4
Beneficial use pool (Fish & Wildlife)	Acres	-	50	50
Retarding pool	Acres	18	56	74
Principal Spillway				
Rainfall Volume (areal) (1 day)	In.	5.5	5.5	
Runoff Volume (10 day)	In.	8.7	8.7	
Capacity of Low Stage (Max.)	cfs	60 2/	-	
Capacity of High Stage (Max.)	cfs	135	90	
Frequency operation - Emer. Spillway	% Chance	1	1	
Size of Conduit	Diam. In.	30	24	
Emergency Spillway				
Rainfall Volume (ESH) (areal)	In.	9.0	9.0	
Runoff Volume (ESH)	In.	5.5	6.3	
Type		Veg.Earth	Veg.Earth	
Bottom Width	Ft.	100	50	
Velocity of flow (Ve)	Ft/Sec.	8.6	7.6	
Slope of exit channel	Ft/Ft.	0.026	0.028	
Maximum water surface elevation	Ft.	1345.4	1458.1	
Freeboard				
Rainfall Volume (FH) (areal)	In.	22.7	22.7	
Runoff Volume (FH)	In.	18.4	19.7	
Maximum water surface elevation	Ft.	1351.7	1463.3	
Capacity Equivalents				
Sediment Volume (100 year total)	In.	0.024	0.32	
Retarding Volume	In.	2.47	2.34	

1/ Set by procedures outlined in NEH-4, Chap. 21, routed through first stage opening. The elevation required to store the runoff from the evaluation storm is: Site No. 1, 1338.9; Site No. 2, 1453.7.

2/ Maximum Q through a 2.1' x 1.0' orifice.

3/ Crest of Emergency Spillway

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TABLE 3A - STRUCTURE DATA

CHANNELS (CLOSED CONDUIT)

Mill Brook Watershed, New York

Channel Name	Reach	Drainage Area	Capacity (cfs)		I.D. Concrete Pipe	Designed Depth of Flow	Hydraulic Gradient	"n" Value	Velocity	Excavation	Bedding	Earth Fill	Seed-ing	2/ Type of Work	Before Project	
			Req'd	Design											Type of Chan-nel	Flow Condi-tion4/
	(ft.)	(sq.mi.)			(ft.)	(ft.)	(ft/ft)		(fps)	(cu.yds.)	(cu.yds.)	(cu.yds)	(ac.)			
Mill Brook	1/ 1,318	4.6	700	707	6.5	6	0.016	0.013	22	3,500	2,251	3,590	0.6	V	M	Pr

1/ Includes 38 feet for a transition section from rectangular culvert to round closed conduit and 35 feet for a SAF stilling basin.
2/ Stabilization as primary purpose of channel work.
3/ Manmade ditch or previously modified channel.
4/ Perennial or continuous flow except in extreme drought.

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TABLE 4 - ANNUAL COST

Mill Brook Watershed, New York
1/
(Dollars)

Evaluation Unit	Amortization of 2/ Installation Cost	Operation and Maintenance Cost	Total
All Structural Measures	102,700	17,800	120,500
Project Administration	10,900	: : : :	10,900
GRAND TOTAL	113,600	17,800 3/	131,400

1/ Price base: Installation, Future Adjusted.
2/ 100 years @ 6 7/8 percent interest.
3/ Includes $13,600 for operation, maintenance, and replacement for the fish and wildlife and recreational facilities.

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TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS

Mill Brook Watershed, New York
1/
(Dollars)

Item	Estimated Average Annual Damage		Damage Reduction Benefits
	Without Project	With 2/ Project	
Floodwater			
Urban	28,420	0	28,420
Streets and Utilities	2,090	0	2,090
Streambank Stabilization Structures	23,590	0	23,590
Subtotal	54,100	0	54,100
Indirect	8,120	0	8,120
TOTAL	62,220	0	62,220

1/ Price base: Future adjusted
2/ Damages and benefits will accrue from floods of greater magnitude than the 100-year frequency, but were not evaluated.

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TABLE 6 - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Mill Brook Watershed, New York

(Dollars) 1/

Evaluation Unit	AVERAGE ANNUAL BENEFITS			Total	Average Annual Cost	Benefit Cost Ratio
	Damage Reduction	Fish & Wildlife & Recreation	Secondary			
All Structural Measures	61,360 2/	89,240	15,100	165,700	120,500	1.4:1
Project Administration	: : :	: : :	: : :	: : : :	10,900	: : :
GRAND TOTAL	61,360	89,240	15,100	165,700	131,400	1.3:1

1/ Cost : Price base 1974. Benefits: Future adjusted.
2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $860 annually.

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INVESTIGATIONS AND ANALYSES

LAND TREATMENT

Present and future land use and land treatment needs were determined by the Service, representatives of the New York State Division of Lands and Forests, and the United States Forest Service.

Basic data used in developing the land treatment program included records of land treatment practices already applied by landowners in the watershed, land use trends, soil survey data, and information contained in the Conservation Needs Inventory. Technical assistance time requirements were based on records of time required to establish these practices in the past. Cost of establishing these practices was based on records maintained by the Chenango County Agricultural Stabilization and Conservation Service, the Chenango County Soil and Water Conservation District, and the New York State Department of Environmental Conservation, Division of Lands and Forests.

Information on the hydrologic condition of the forest land in the watershed, and the reasons for the present hydrologic conditions, were obtained in a series of systematically located sample field plots. Information gathered on the plots included measurements of the incorporated soil organic matter, compaction of the forest floor, humus types, and the hydrologic soil grouping. From these data, runoff curve numbers were obtained for the forest land. Disturbances, such as fire, cutting, logging, grazing, insect, and disease damage, were evaluated and existing forest management conditions were observed on each plot.

Site characteristics, such as soil texture, soil depth, and slope, were measured and the physical ability of the site to improve hydrologically was determined. From this information, forest management practices, which would maintain or improve forest resources and hydrologic conditions, were determined for the watershed.

FISH AND WILDLIFE AND RECREATION

A joint interagency field reconnaissance was conducted to evaluate the fish and wildlife aspects of the watershed. The reconnaissance included a visual inspection of the watershed as well as a review of existing file data. Participating was a biologist from each of the following agencies: the New York State Department of Environmental Conservation, Division of Fish and Wildlife; U.S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife; and the Soil Conservation Service.

Stream survey data of the Division of Fish and Wildlife was used to locate existing fisheries. Wildlife densities were supplied from U.S. Fish and Wildlife Service records and verified by the Division of Fish and Wildlife.

The impoundment of structure No. 2 was evaluated for fishery potential by the Division of Fish and Wildlife, and by using the Service's "Empirical Guide to Suitability of P.L. 566 Impoundments for Trout."

Construction area habitat, stream physical characteristics, and wetland types were identified by field observation. The recreational and fish and wildlife development at site No. 2 was designed in accordance with guidelines of the Department of Health Education and Welfare, New York State Department of Public Health, and the Soil Conservation Service.

HYDROLOGY AND HYDRAULIC INVESTIGATIONS

The watershed was divided into five subareas to reflect existing runoff patterns and to evaluate effects of works of improvement to be installed.

The soils and cover data were developed from soils maps and land use data for the area, with assistance from the district conservationist. Hydrologic soil cover complexes were tabulated as outlined in Chapter 9 of the Soil Conservation Service National Engineering Handbook, Section 4 (NEH-4). Curve numbers for open land were taken from Table 9.1 (NEH-4). The Forest Service computed curve numbers for the forest lands.

Rainfall data was obtained from U.S. Weather Bureau Technical Paper No. 40 and numerous adjacent rainfall gages (both recording and non-recording). Rainfall was converted to runoff using the computed runoff curve numbers and the tables accompanying Soil Conservation Service Technical Release No. 16.

The time of concentration of subareas was based on channel hydraulics, watershed lag (ES-1015), and overland flow. Velocities for overland flow were computed using Soil Conservation Service Memorandum WS-Hydrology EWP-1 (UD), August 15, 1956.

Channel and valley sections were obtained by field survey. Sixteen channel and valley sections were located to reflect flow through constrictions and to determine stage-damage relationships. Water surface profiles were computed for the evaluation reach using a computer program available at the Soil Conservation Service Technical Service Center, Upper Darby, Pennsylvania.

The Mill Brook routings were performed using the procedures outlined in Soil Conservation Service Technical Release No. 20. The annual series frequency-discharge relationships were developed for use in the urban area. The frequency-discharge curves were modified to determine the effect of various combinations of retarding structures on peak flows through the damage reach. The reinforced concrete pipe capacity was designed to handle the 100-year frequency discharge with partial pipe flow.

The storage requirements and release rates for structures No. 1 and 2 were based on the storage volume required by procedures outlined in Chapter 21 of the Soil Conservation Service National Engineering Handbook, Section 4 (NEH-4). The storage volume was checked to make sure that protection against the 100-year evaluation storm was provided. The storage volume required for 100-year protection is shown on Table 3.

Engineering

Sources of information for the study of structural measures to meet project objectives include the following:

1. U.S. Geological Survey Maps, 7-1/2 minute with 20-foot contour intervals.

2. Photo coverage at a scale of 1:7920.

3. Field surveys tied to USGS datum for structure sites No. 1 and 2 and sections of the downstream channels at locations selected by the staff hydrologist. The field surveys of the structures consisted of centerline of dam profiles and a closed traverse of the pool area with random shots and stadia distances to fill in topographic detail.

4. Maps with location of apparent ownership or property lines.

Two potential structure sites were investigated. Site No. 1 was investigated for floodwater retarding storage. Site No. 2 was investigated for multiple-purpose for different levels of development. Standard Soil Conservation Service criteria were followed in development of designs.

Geologic investigation for site No. 2 showed rock close to ground surface. A 24-inch pipe was chosen for the principal spillway because of the available unyielding foundation. Borrow material is available on the right abutment and some may be taken from below the proposed waterline to improve the shoreline for recreational purposes.

Cost estimates were based on recent New York Public Law 566 contract unit prices for such items as concrete, earth fill, common and rock excavation, rock riprap, clearing, and seeding.

Reservoir routings, earth fill calculations, and spillway excavation calculations were accomplished by using the computer services of the Automatic Data Processing Unit in Upper Darby, Pennsylvania and computer programs developed by the Soil Conservation Service for this purpose.

Geology

Field procedures utilized in the investigations included the use of electrical resistivity apparatus, manual hand sampling tools, a backhoe, and two drill rigs. Emergency spillway, foundation, and borrow areas were examined in detail. All findings were tabulated and evaluated with existing geologic reports, visual observations made in the field, and other data available.

Representative soil samples from the sites were tested in the Soil Conservation Service laboratory in Syracuse, New York, in accordance with testing procedures outlined by ASTM. Foundation materials are primarily dense glacial till and shale bedrock. Minor leakage is anticipated. Sufficient borrow is available at both sites.

The following table summarizes the site conditions.

TABLE S - GEOLOGIC SITE CONDITIONS

Site	Left Abutment	Flood Plain	Right Abutment
1	Till & Lacustrine	Outwash, Till & Shale	Till
2	Till	Shale	Till

Sediment storage requirements for the proposed structures were calculated using the Musgrave Soil Loss Equation and procedures outlined in the Watershed Planning Guide and Soil Conservation Service Technical Release No. 12. Factors considered were land use, cover conditions, topography, sheet and channel erosion, delivery rates, and trap efficiency of the reservoirs. All of the basic data were obtained from soils maps, aerial photographs, and actual field measurements. Storage for an expected 100-year accumulation of sediment was computed for both sites.

Investigation of the channel downstream from Route 8 was conducted by means of soil survey information, interviewing property owners, field observation, and hand auger probes. The soil material, in which the channel is located, is Chenango gravelly silt loam. This coarse soil is developed from glacial outwash deposits and extends to a depth greater than 36 inches below the present channel bottom. The channel bed consists of cobbles, flagstones, and gravel.

The glacial outwash appears to be sufficiently coarse and of sufficient depth to provide a firm foundation for the proposed concrete pipe. Settlement and consolidation should not be a problem in this area.

The preliminary earthquake investigation included location of the watershed on the Seismic Risk Map from Algermissen's 1969 Seismic Risk Map of U.S., a review of earthquake records in "Earthquake History of United States," Part I, ESSA, 1965; a study of regional geology maps for evidence of major active faulting or areas of crustal movement; and a study of the geology at proposed structure sites to identify critical materials or geologic conditions that pose as earthquake hazards.

ARCHEOLOGICAL AND HISTORICAL SURVEY

A New York State Museum and Science Service archeologist conducted a literature review, in order to determine if identified archeological sites are present in the watershed. The archeologist reported no recorded sites in the immediate vicinities of planned structural locations; however, there is a significant hilltop site (Indian activity) in the general area. Therefore, the Museum and Science Service archeologist recommended that an archeologist survey the structural sites and prepare a report prior to development of an environmental impact statement. An archeological survey was completed during the summer of 1974 under the supervision of Professor Fred Plog, State University of New York at Binghamton.

A literature review, relative to historical sites in the watershed, was conducted by the Division for Historic Preservation of the New York State Parks and Recreation. Three historic sites were identified.

WATER QUALITY

A water quality testing program was established through an agreement between the Environmental Protection Agency, Rochester, New York and the Soil Conservation Service. Water samples were obtained approximately once a week for a four to six week period, beginning in March 1974. Each sample was tested for turbidity, T.O.C., conductivity, organic nitrogen, ammonia nitrogen, nitrate-nitrite nitrogen, total phosphorus, and chloride. All tests were performed as specified by the Environmental Protection Agency.

ECONOMICS

The 100-year synthetic series method was used in the flood damage analyses. Flood stage-damage data were prepared for each urban property located within the 100-year frequency flood plain. Proprietors were interviewed in order to develop stage-damage relationships for commercial properties. Standardized stage-damages, based on values of properties, were used for residential properties. Estimates of streets and utilities damage, by stage, were obtained from village of New Berlin officials. Frequency-damage curves were developed utilizing the stage-damage and stage-frequency data.

Existing streambank stabilization structures were analyzed. It was determined that major renovations would have to be made and that subsequent major renovations would be required at 20-year intervals in order to maintain the system. The maintenance cost of the present system was compared with maintenance cost of planned channel for identification of benefits.

Future projected values, based on OBERS projections, were applied to the flood damage and damage reduction benefits. Indirect flood damages were estimated to be 15 percent of the direct floodwater damages.

Recreation and fish and wildlife user day estimates were made by Service personnel. The estimates reflect "design capacity" of planned fish and wildlife facilities and seasonal use. The Water Resources Council's "Principles and Standards" were used in determining the value of fish and wildlife benefits ($2.25 per recreation visit).

Secondary benefits stemming from project measures were estimated at 10 percent of direct flood damage reduction and recreation and fish and wildlife benefits.

Average annual structural measure costs were determined by amortizing estimated total installation costs of structural measures (1974 prices), using 6-7/8 percent interest for 100 years, and by adding estimated operation and maintenance costs. Estimated operation and maintenance costs of structures No. 1 and 2 and the channel work, were based on actual costs incurred for similar structures in the area. Annual operation, maintenance, and replacement costs, of the recreational and fish and wildlife facilities, were estimated at 3 percent of the construction cost, plus 10 cents per recreation visit. Future projected values were then applied to the estimated operation and maintenance costs.

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BIBLIOGRAPHY

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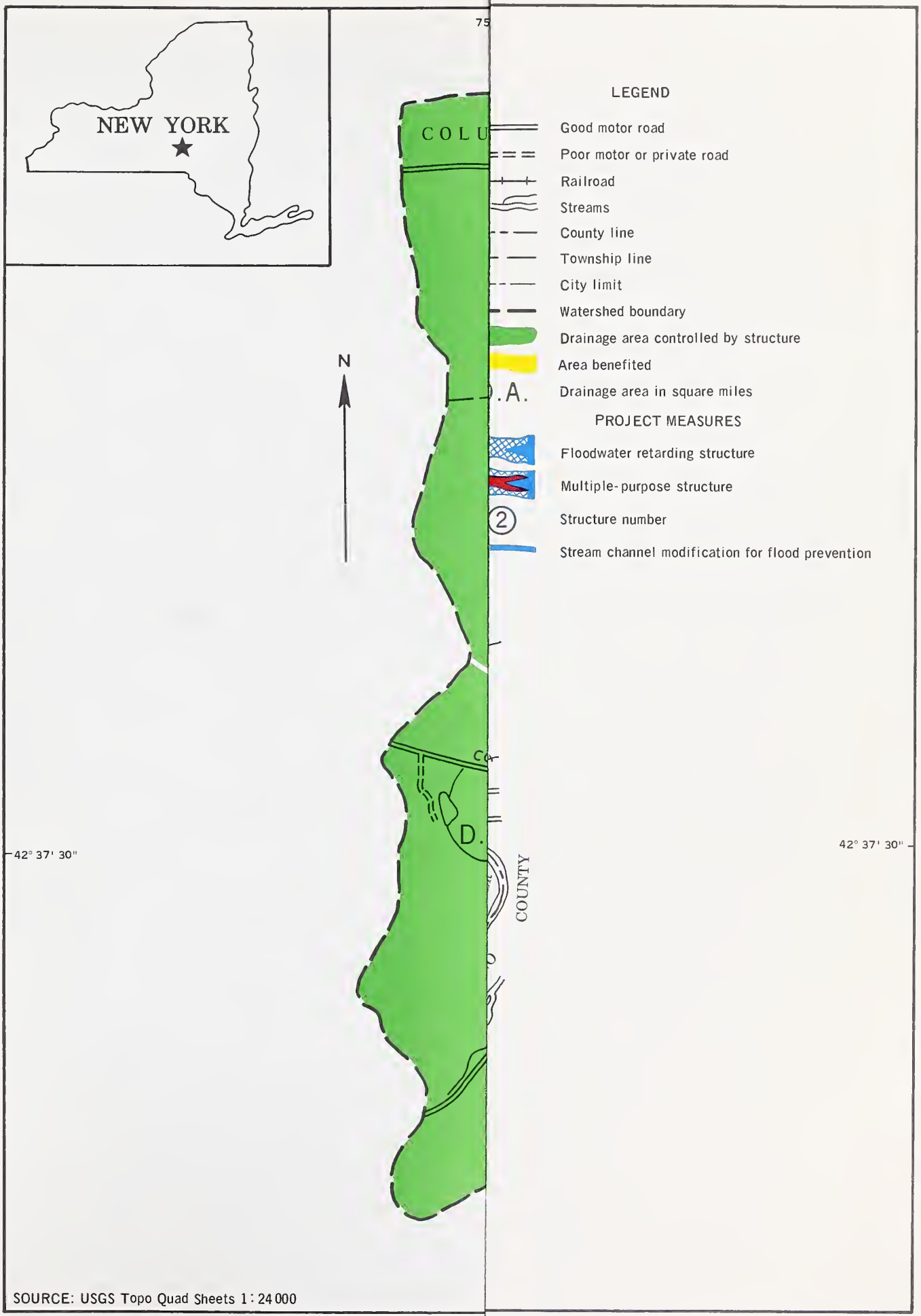
APPENDIX A



USDA-SCS-HYATTSVILLE, MD. 1973

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PROJECT MAP
MILL BROOK WATERSHED
CHENANGO COUNTY, NEW YORK

75° 22' 30"

75° 20' 00"

42° 37' 30"

N

COLUMBUS

SHERBURNE

TURNPIKE

NEW BERLIN

D.A. 2.09 sq. mi.

COUNTY

ROUTE 29

D.A. 1.35 sq. mi.

HILL

STREET

ROAD

NEW BERLIN

13 + 18

0 + 00

UNADILLA VALLEY

UNADILLA RIVER

OTSEGO COUNTY

LEGEND

- Good motor road
- Poor motor or private road
- Railroad
- Streams
- County line
- Township line
- City limit
- Watershed boundary
- Drainage area controlled by structure
- Area benefited
- D.A. — Drainage area in square miles

PROJECT MEASURES

- Floodwater retarding structure
- Multiple-purpose structure
- ② — Structure number
- Stream channel modification for flood prevention

Scale 1:24000

1 Mile — 5000 Feet

SOURCE: USGS Topo Quad Sheets 1:24000

100 Year without project

Stream

Covered conduit

① Library

② Upjohn's St. Andrews church

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

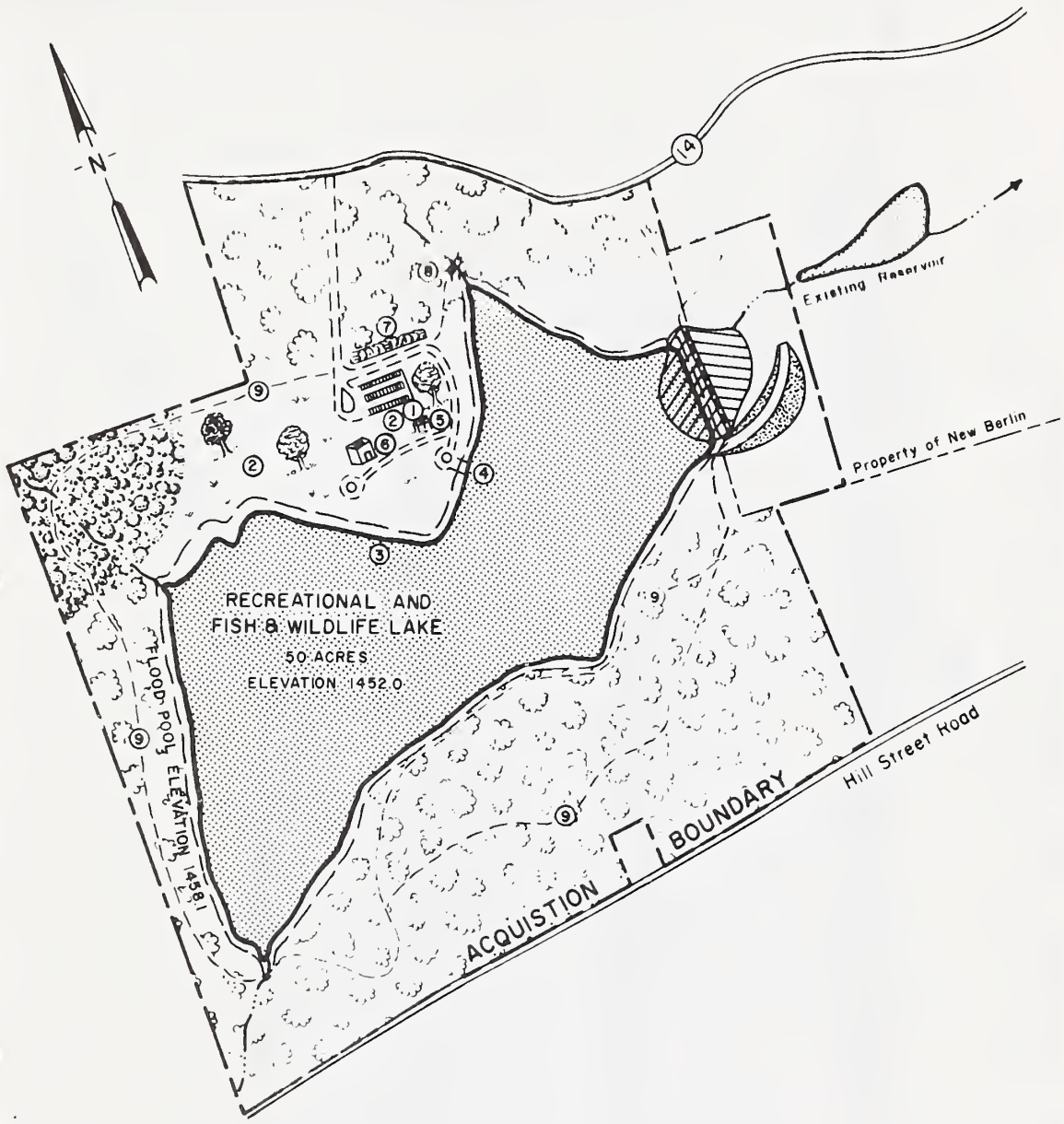
MILL BROOK WATERSHED
URBAN FLOODPLAIN

CHENANGO COUNTY, NEW YORK

Scale 1:4000

0 500 1000 Feet

USDA-SCS-HYATTSVILLE, MD. 1973



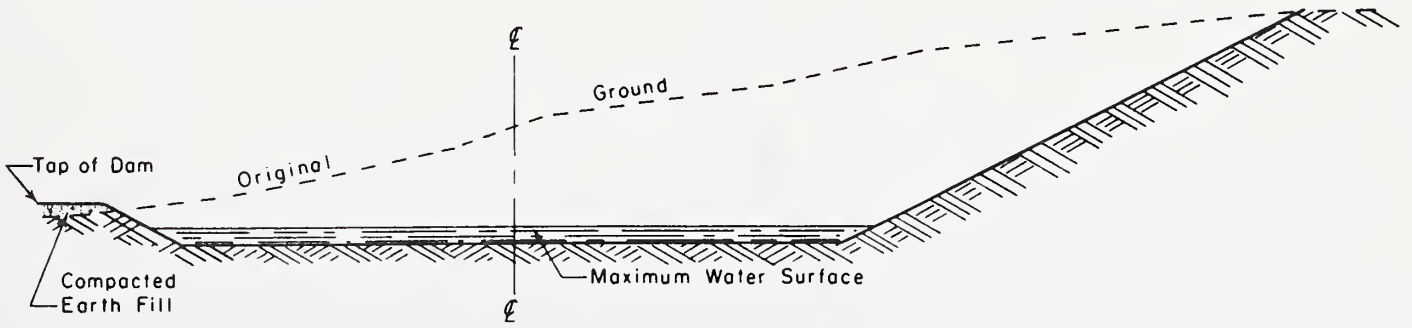
LEGEND

① Parking area
② Picnic area
③ Bathing area
④ Boat launching area
⑤ Shelter house
⑥ Bath house
⑦ Screening hedge
⑧ Footbridge
⑨ Nature and hiking trail

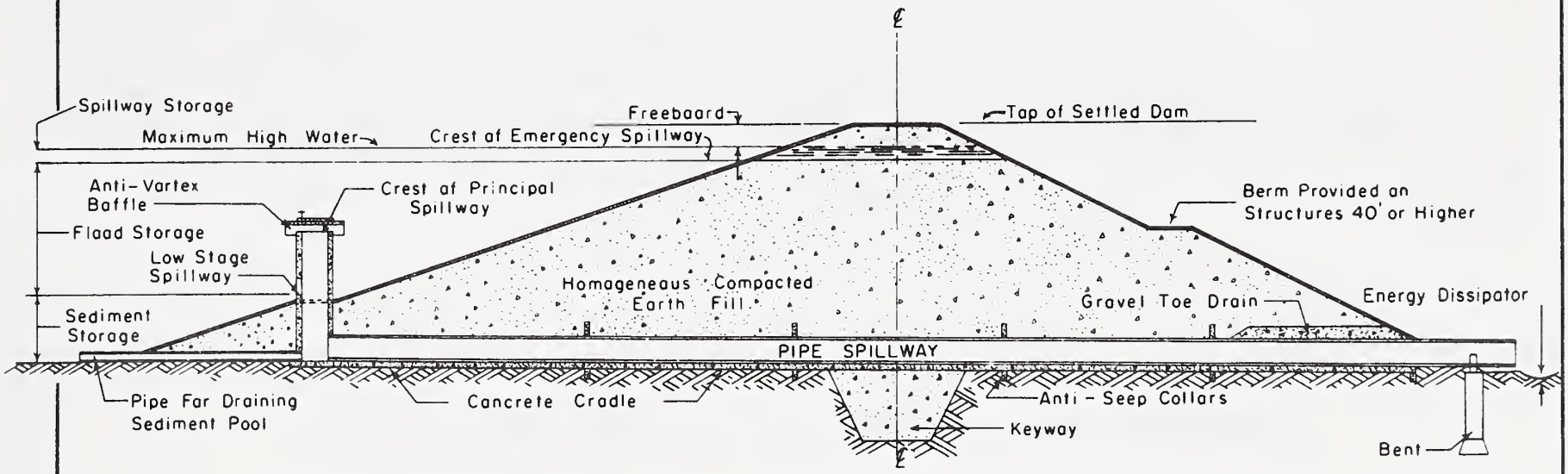
MILL BROOK WATERSHED

Recreational and Fish & Wildlife Map

CHENANGO COUNTY, NEW YORK



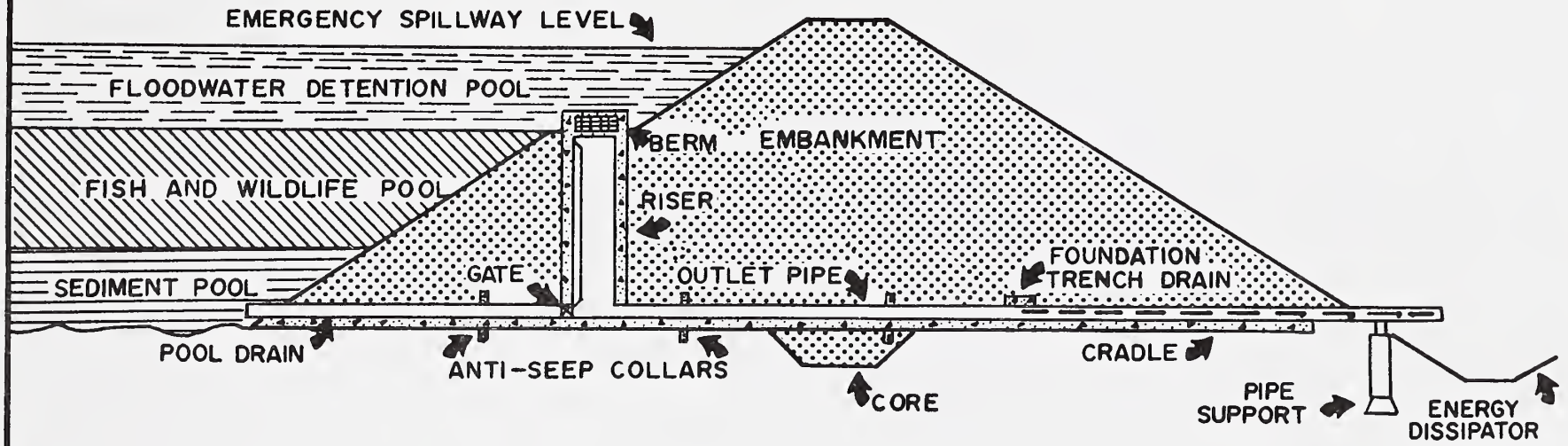
CROSS SECTION OF EMERGENCY SPILLWAY
CONTROL SECTION



TYPICAL CROSS SECTION OF FLOODWATER RETARDING STRUCTURE
ALONG PRINCIPAL AND EMERGENCY SPILLWAYS

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



TYPICAL CROSS SECTION OF MULTIPLE-PURPOSE STRUCTURE

USDA-SCS-HYATTSVILLE MD 1973

APPENDIX B

DEFINITION OF LAND TREATMENT MEASURES

Conservation Cropping System: Growing crops in combination with needed cultural and management measures. Cropping systems include rotations that contain grasses and legumes as well as rotations in which the desired benefits are achieved without the use of such crops.

Contour Farming: Farming sloping cultivated land in such a way that plowing, preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces, diversions, or contour strips.)

Diversion: A channel with a supporting ridge on the lower side constructed across the slope.

Pasture and Hayland Management: Proper treatment and use of pastureland or hayland.

Pasture and Hayland Planting: Establishing and reestablishing long-term stands of adapted species of perennial, biennial, or reseeding forage plants. (Includes Pasture and Hayland Renovation. Does not include Grassed Waterway or Outlet on cropland.)

Stripcropping: Growing crops in a systematic arrangement of strips or bands on the contour to reduce water erosion. The crops are arranged so that a strip of grass or close-growing crop is alternated with a strip of clean-tilled crop or fallow or a strip of grass is alternated with a close-growing crop.

Subsurface Drain: A conduit, such as tile, pipe, or tubing, installed beneath the ground surface and which collects and/or conveys drainage water.

Brush Management: Management and manipulation of stands of brush by mechanical, chemical, or biological means, or by controlled burning on rangeland, native pasture, pastureland, recreationland and wildlife-land. (Includes reducing excess brush to restore natural plant community balance and manipulating brush stands through selective and patterned control methods to meet specific needs of the land and objectives of the land user.)

Pond: A water impoundment made by constructing a dam or embankment, or by excavating a pit or "dugout".

Proper Grazing Use: Grazing at an intensity which will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation.

Trough or Tank: A trough or tank with needed devices for water control and waste water disposal, installed to provide drinking water for livestock.

Tree Planting: Planting tree seedlings or cuttings.

Fishpond Management: Developing or improving impounded water to produce fish for domestic use or recreation.

Hedgerow Planting: Establishing a hedgerow or living fence of shrubs or trees within, across, or around a field.

Wildlife Wetland Habitat Management: Retaining, creating, or managing wetland habitat for wildlife.

Wildlife Upland Habitat Management: Retaining, creating, or managing wildlife habitat other than wetland.

NONGAME MAMMALS FOUND THROUGHOUT NEW YORK

Least Weasel

Chipmunk

Bonaparte's Weasel

N. Y. Weasel

Norway (House) Rat

Allegheny Wood Rat

Water Shrew

Smoky Shrew

Star-nosed Mole

Hairy-tailed Mole

Common Mole

Least Shrew

Short-tailed Shrew

Gray Fox

Red Squirrel

Eastern Flying Squirrel

Common (cinereous) Shrew

Pigmy Shrew

Say's Bat

Big Brown Bat

Pipistrelle

Hoary Bat

Canadian Deer Mouse

Woodland Jump Mouse

Red Backed Mouse

House Mouse

Field (Meadow) Mouse

Lemming Mouse

Rock (yellow-nosed) Vole

Red Fox

Woodchuck

LISTINGS OF REPTILES AND AMPHIBIANS

Reptiles	Common Name	Scientific Name
A) Snakes		
	Eastern Worm Snake	Carphophis amoenus amoenus
	Eastern Ring-Necked Snake	Diadophis punctatus edwardsi
	Northern Water Snake	Natrix sipedon sipedon
	DeKay's Snake	Storeria dekayi
	Eastern Ribbon Snake	Thamnophis sauritus sauritus
	Eastern Garter Snake	Thamnophis sirtalis sirtalis
	Eastern Hog-Nosed Snake	Heterodon platyrhinos platyrhinos
	Northern Black Racer	Coluber constrictor constrictor
	Eastern Smooth Green Snake	Opheodrys v. vernalis
	Black Rat Snake	Elaphe obsoleta obsoleta
	Eastern Milk Snake	Lampropeltis doliata triangulum
	Red-Bellied Snake	Storeria occipitomaculata
	Eastern Timber Rattlesnake	Crotalus horridus horridus
	Northern Copperhead	Ancistrodon contorteix mokeson
B) Turtles		
	Stinkpot	Sternotherus odoratus
	Wood Turtle	Clemmys insculpta
	Eastern Box Turtle	Terrapene carolina carolina
	Map Turtle	Graptemys geograp
	Eastern Painted Turtle	Chrysemys picta picta
	Common Snapping Turtle	Chelydra serpentina serpentina
	Spotted Turtle	Clemmys guttata
Amphibians		
A) Salamanders		
	Red Eft Newt	Diemictylus viridescens
	Red-Backed Salamander	Plethodon cinercus
	Slimy Salamander	Plethodon glutinosus
	Spring Salamander	Gyrinophilus porphyriticus
	Two-Lined Salamander	Eurycea bislineata
	Dusky Salamander	Desmognathus fuscus
	Spotted Salamander	Ambystoma maculatum
	Mountain Salamander	Desmognathus ochrophaeus

Amphibians	Common Name	Scientific Name
B) Toads & Frogs		
	Spadefoot	Scaphiopus holbrooki
	American Toad	Bufo terrestris americanus
	Fowlers Toad	Bufo woodhousei fowleri
	Cricket Frog	Acris gryllus
	Swamp Cricket Frog	Pseudacris nigrita triseriata
	Peeper	Hyla crucifer
	Tree Toad	Hyla versicolor
	Mink Frog	Rana septentrionalis
	Wood Frog	Rana sylvatica
	Pickerel Frog	Rana palustris
	Meadow or Lepard Frog	Rana pipiens
	Green Frog	Rana clamitans
	Bullfrog	Rana catesbeiana