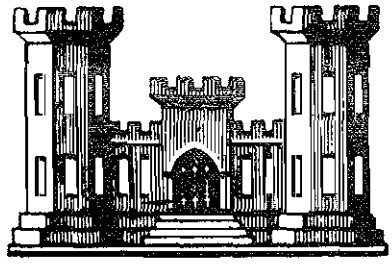
CONNECTICUT RIVER FLOOD CONTROL

LITTLEVILLE
DAM & RESERVOIR

MIDDLE BRANCH
WESTFIELD RIVER, MASSACHUSETTS

DESIGN MEMORANDUM NO. IX B

MASTER PLAN
FOR
RESERVOIR DEVELOPMENT



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS WALTHAM, MASS.

MARCH 1966

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS. 02154

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDED-R

7 March 1966

SUBJECT: Littleville Reservoir, Connecticut River Basin, Massachusetts - Master Plan for Reservoir Development

TO: Chief of Engineers
ATTN: ENGCW-O

1. Submitted for review and approval is Design Memorandum No. IXB, Master Plan for Reservoir Development, in accordance with EM 1110-2-1150.

2. The plan has been developed to provide for maximum use of the reservoir by the public consistent with the resources of the area and the authorized flood control function of the project.

3. The plan has been coordinated with and concurred in by the Operations Division and the Real Estate Division.

FOR THE DIVISION ENGINEER:

John Wm Leslie

Incl (quad)
as

JOHN WM. LESLIE
Chief, Engineering Division

FOREWORD

The completion of the Littleville Flood Control and Water Supply Reservoir on the Middle Branch of the Westfield River in the west central part of Massachusetts provides an opportunity to supplement existing public recreational resources within an area nearby the heavily populated region of southern New England and New York. Over 1.3 million persons presently live within a 40-mile radius of the project.

Springfield, Massachusetts is just over 15 miles from the project and the Hartford, Connecticut area is just under 40 miles. These cities account for over half of the population within the 40-mile zone of influence.

The National Park Service, the Massachusetts Department of Natural Resources, the Massachusetts Division of Fisheries and Game and the Westfield River Watershed Association have expressed strong interest in the availability of Littleville Reservoir for public recreation.

This Master Plan has been developed from a study of the recreational requirements of the region and the recreation, conservation, and wildlife potentialities of the reservoir area. Basic initial development by Federal funds is proposed to the extent necessary for public access, parking, and sanitation, and facilities to enable the public to enjoy the recreational resources.

In addition to flood control storage, the project also provides for future water supply storage for the City of Springfield. Since Massachusetts public health laws prohibit use of a domestic water supply reservoir for water contact sports, the Massachusetts Water Resources Commission has recommended that there be no formal development to facilitate bathing. Under these conditions, in the interest of public safety, bathing will be prohibited even during the interim period before the project is used for water supply purposes.

Consequently, it is contemplated that future permanent development and management would be by the Corps of Engineers, with cooperation, coordination and license agreements with the City of Springfield for water supply and with the Massachusetts Division of Fisheries and Game managing appropriate fish and wildlife functions.

INDEX TO DESIGN MEMORANDA

LITTLEVILLE RESERVOIR

Design Memo No.	Title	Submission Date	Date Approved
I	Hydrology & Hydraulics		
	Preliminary	6 Jul 1960	1 Aug 1960
	Final	25 Apr 1961	26 May 1961
II	General Design	21 Apr 1961	29 May 1961
III	Concrete Material	16 Jun 1961	7 Jul 1961
IV	Site Geology	31 Aug 1961	18 Sep 1961
V	Real Estate	2 Jun 1961	21 Aug 1961
VI	Relocations	2 Jun 1961	13 Jul 1961
VII	Embankment & Foundations	14 Dec 1961	12 Jan 1962
VIII	Detailed Design of Structures	28 Jul 1961	7 Sep 1961
IXA	Reservoir Development Preliminary	3 Jan 1962	12 Feb 1962
IXB(C1)	Recreation Facilities (Construction) (Part of Master Plan)	19 Jul 1965	2 Aug 1965
IXB	Master Plan for Reservoir Development	7 Mar 1966	

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MASTER PLAN
FOR
RESERVOIR DEVELOPMENT

LITTLEVILLE RESERVOIR, MASSACHUSETTS

MASTER PLAN DRAWINGS

EXHIBITS

I. INTRODUCTION

1-01. Authorization. The Littleville Dam and Reservoir was authorized by the Flood Control Act of 1958 (Public Law 85-500, 85th Congress, 1st Session) as an addition to the comprehensive plan for flood control in the Connecticut River Basin. Authorization of the comprehensive plan is contained in the Flood Control Act of 1938 (Public Law 561, 75th Congress, 3rd Session), as modified by the Flood Control Act of 1941 (Public Law 228, 77th Congress, 1st Session) and the Flood Control Act of 1944 (Public Law 534, 78th Congress, 2nd Session.)

Provision for future water supply for the City of Springfield, Massachusetts, has been added to the project as authorized by the Water Supply Act of 1958 (Public Law 85-500, 85th Congress, 1st Session).

1-02. Purpose and Scope. The purpose of this Master Plan is to present a comprehensive and coordinated program for the development, management and use of the Littleville Reservoir for public purposes which are compatible with the authorized project purposes. This plan will serve as a guide in the operation and control of land and water use for the derivation of maximum public benefits from the resources of the project. It is intended that this plan will be flexible so that adjustments may be made to it as any changing conditions may warrant. It will be necessary to revise this plan at a future date when the City of Springfield makes use of the water supply.

1-03. Cooperative Planning. The following agencies participated in studies leading to the recommended Master Plan:

Dept. of the Army, New England Division Corps of Engineers
U. S. Dept. of Health, Education and Welfare
U. S. Fish and Wildlife Service
National Park Service
Mass. Division of Fisheries and Game
Mass. Dept. of Natural Resources
Mass. Water Resources Commission
Mass. Dept. of Public Health
City of Springfield, Massachusetts
Westfield River Watershed Association

II. DESCRIPTION OF AUTHORIZED PROJECT

2-01. Location. The Littleville Flood Control Dam is located on the Middle Branch of the Westfield River within the towns of Huntington and Chester, Hampshire and Hampden Counties, Massachusetts. The dam site is about one mile upstream of the confluence of the Middle Branch and the Westfield River and about 2.7 miles north of the Huntington town center. The location of the project is shown on Plate No. 1.

2-02. Pertinent Data. The dam is a rolled earth and rockfill structure, 1,360 feet in length, with a maximum height of 164 feet above the stream bed. A 935-foot long dike with maximum height of 46 feet is located on a saddle between a plateau containing the spillway and the eastern ridge. The top of the dam and dike is at elevation 596 feet mean sea level. The dam contains a chute spillway with a 400-foot long concrete weir at elevation 576 feet, m. s. l. Access is provided over the spillway by a bridge 120 feet in length.

There are two separate outlet works -- one used for diversion during construction and for future water supply, including provision for downstream flow regulation; the other for flood control regulation. Specific data on the project is contained in Design Memorandum No. 2 - "General Design" dated 21 April 1961 and approved 29 May 1961.

2-03. Description of Reservoir Area. Land acquired for the project totals about 1,680 acres of which about 1,630 acres is in fee simple, the remainder consisting of flowage easements. No additional land is needed for development or protection of project recreational resources.

The area lies in a rural section of the state, characterized by hills with steep slopes and separated by narrow valleys. About 90 percent of the area is wooded, supporting mixed hardwoods, and conifers characteristic of the upland area in this part of Massachusetts.

The reservoir area is irregularly shaped, being approximately 3 miles long with an average width of about 1/3 mile.

The topography of the area is characterized by hilly land with considerable relief; elevations within the immediate vicinity of the reservoir range from 432 feet, m. s. l. at the dam site to about 1,250 feet m. s. l. at the top of the adjacent hills and ridges.

2-04. Climate. The average temperature for January and July in the vicinity of the project is 24 degrees F and 70 degrees F, respectively, with extremes varying from 100 degrees F to 24 degrees below zero F. Precipitation for the year in Chester averages about 45 inches and is well distributed among the seasons with a maximum of 67.50 inches and a minimum of 32.23 inches being recorded over a 44-year period of record. The average annual snowfall is about 53 inches. Prevailing winds are from the northwest in the winter and from the south in the summer.

III. PROJECT RESOURCES

3-01. Suitability of Reservoir Area for Recreational Use. The Littleville Reservoir is a dual-purpose project providing flood control storage for reduction of flood damages on the Westfield and Lower Connecticut Rivers and as a future source of water supply storage for the City of Springfield, Massachusetts. Actual use of the reservoir as a source of domestic water by the City of Springfield has not as yet been initiated.

The water supply pool of about 275 acres with a shoreline of over 5 miles will create a major attraction to those seeking outdoor recreation opportunities in an area where there is a present lack of such resources in public ownership. Aquatic related activities find the most favor with the general public thus enhancing the recreational outlook for the permanent pool.

The water supply pool and the land area of the reservoir afford excellent increased opportunities for public fishing, boating, picnicking, camping and nature study with moderate development of basic facilities. Hunting is popular in the vicinity and, with adequate safety precautions for other uses, can be continued to be enjoyed. Forested hills afford excellent cover for deer and small game. The water supply pool by providing a cold water fishery with excellent management capabilities, can constitute one of the most striking contributions for fisheries promulgated in recent years in this region. The project is readily accessible over the state highway system.

3-02. Fish and Wildlife Resources. Hunting and fishing have been active sports in the Middle Branch of the Westfield River Basin. Local and out-of-state anglers have utilized the waters which have been stocked each year with 15,000 trout. Fishing pressure is heavy from opening day (third Saturday in April) to Memorial Day and tapers off rapidly due to low stream

flow and warm water temperatures which are unsuitable for trout. The State Division of Fisheries and Game conducted a creel census for the Middle Branch in 1952 revealing a total of 2,500 individual fishing trips. The loss of wildlife habitat by the permanent inundation of 275 acres is expected to be insignificant. The permanent pool will attract some migrating waterfowl and provide opportunity for waterfowl hunting. Of greater significance for future use is the opportunity to assure public access for hunting on approximately 1700 acres taken in fee excluding the dam site and the permanent pool area. Special studies have shown that the fishing pressures on waters supporting trout are about four times the pressures on warm water ponds.

3-03. Report on Wildlife Agencies. A report on the fish and wildlife resources for the Littleville Reservoir project submitted by the U.S. Fish and Wildlife Service in November 1961, was prepared in cooperation with personnel of the Massachusetts Division of Fisheries and Game. The report concluded that the effects of the project on wildlife resources will be beneficial. The report is inclosed as Exhibit A.

3-04. Forestry Resources. Development and management of the forestry resources of the reservoir will be accomplished to the extent practicable and compatible with other uses of the project. It appears, however, that the major value of silvicultural resources are as cover contributing to the presently desirable character of the area. The woodlands are principally of second growth mixed woods of limited merchantable value.

3-05. Other Recreation Resources. A letter report dated 2 November 1961 was received from Region 5 of the National Park Service relative to the recreational potential of this project. This report notes that the pool will help alleviate the present deficiency of water-based recreation areas in the region; that there has been a drastic need for camping and picnic facilities in the area; that boat launching sites and parking areas should be provided; that that a system of hiking trails incorporating interpretive signs of geologic and scientific interest would be a feasible addition to recreation use of the area.

No known archeological or historical resources of significance are affected by the project.

IV. FACTORS INFLUENCING RESERVOIR DEVELOPMENT

4-01. Features of Region Served. Located in western Massachusetts halfway between Springfield and Pittsfield, the project is accessible to all sections of the heavily populated region of southern New England over a road network which is constantly being improved. Interchanges from two interstate Routes, Nos. 90 and 91, are within fifteen miles.

The towns in the immediate vicinity of the reservoir have small industry related to the emery deposits in the area. Agriculture has become almost non-existent as an economic force. In recent years, the area has become one of summer residences, small industry related to emery manufacturing and recreation service industries. The trend away from agriculture has produced a fairly stable economy and at the same time exposed the wage earner to more leisure time for the enjoyment of recreational pursuits.

Reflecting the importance of recreation to the New England economy and indicate of the growing demand for recreational opportunities, are figures compiled by the American Express Travel Survey and the Federal Reserve Bank of Boston which showed that vacationists put about $1.5 billion into the New England economy in 1964 and current reports of various type activities indicate a continued increase. Studies conducted by the Fish and Wildlife Service indicate that over $350 million are spent annually by hunters and fishermen.

4-02. Population. The number of persons residing within 40 miles of the project is over 1.3 million according to the 1960 U.S. census report. A population of 656,000 resided within a radius of 25 miles, representing a population growth of about 15 percent over the 1950 census. Some of the principal cities within a 40-mile radius of the project and having a population of 25,000 inhabitants or over in 1960 follow:

East Hartford, Conn.	44,000
Hartford, Conn.	162,200
Manchester, Conn.	42,000
Torrington, Conn.	30,000
West Hartford, Conn.	62,400
Chicopee, Mass.	61,100
Holyoke, Mass.	52,200
Northampton, Mass.	30,000
Pittsfield, Mass.	57,200
Springfield, Mass.	173,700
Westfield, Mass.	26,300
West Springfield, Mass.	25,000

4-03. Interest in Public Use. Strong public interest has been shown for the past decade in recreational use and development of any project area which would be suitable for public use. The residents of the adjacent towns of Huntington and Chester as well as organized sportsman's clubs have supported this type of use. The Fish and Wildlife Service and the Massachusetts Division of Fisheries and Game recommend fish and wildlife management and public hunting and fishing. The Commonwealth of Massachusetts Water Resources Commission which acted as coordinator for various State agencies and local communities has expressed the interest of the State in utilizing the reservoir area for fish and game management and public hunting and fishing purposes. The Commission has also advised by letter dated 31 January 1961 that:

> "No action will be taken to limit recreational uses until such time as the Department of Public Health deems it wise and necessary for the protection of the purity of the water supply."

The discussions that led to the above action clearly indicate that the Commission desires continuation of all forms of outdoor recreation such as swimming, fishing, picnicking in the watershed of the Middle Branch of the Westfield River. The Director of the Commission notes his belief that all forms of recreational activity should be developed in the drainage area, including the reservoir area. However, he states swimming in the reservoir area should be limited to a degree which can be satisfactorily replaced once the City of Springfield uses the water supply storage. As a result, the Commission has recommended that there be no formal development to facilitate bathing. Without provision of adequate facilities, bathing in the reservoir would be unmanageable and dangerous and as a public safety measure, it will be prohibited.

4-04. Existing Public Recreation Areas. The four states within this 40-mile zone of influence of the project provide state parks, forests, access areas and other recreation areas for the public. The development of these vary considerably in extent. Plate No. 2 shows the location of existing public recreation areas and available uses. It will be noted that very few of these public areas provide water-based activities.

4-05. Other Federal Reservoirs. Knightville Dam and Reservoir lies adjacent to the Littleville site. It was constructed for flood control purposes and has no permanent pool adapted for fishing, swimming and boating. Despite this lack, it attracted 67,000 visitors in 1963 and 74,000 in 1964. Major uses of the project are stream fishery, pheasant hunting,

picnicking and sightseeing. Other completed flood control reservoir projects are not located sufficiently near to affect the projected demand for the type of opportunity in the Littleville area.

The physical characteristics of Knivhtgille and Littleville reservoirs complement each other for desired public uses. Each possesses distinctive assets which will increase public recreational benefits. Knightville offers limited fishing and hunting opportunity, picnicking, and scenic views. Littleville offers opportunity for these activities plus boating, group camping and excellent fishing.

4-06. Anticipated Public Use. Estimated annual attendance at the Littleville project for day and overnight use is based upon an analysis of the population, population trend, and consideration of other facilities and recreational opportunities in the immediate vicinity of the project, weighted by experienced use at comparable State and Federal areas. It is estimated that the project will attract 100,000 visitors annually by 1969.

V. DEVELOPMENT PLAN

5-01. General. The most significant recreational resource of the project is the 275-acre permanent pool. As this water area has been established as a future domestic water supply, and Massachusetts public health laws prohibit use of it for water contact sports, its recreational value is limited to fishing and boating uses.

5-02. Land Allocation. The allocation of reservoir lands for specific purposes is shown on Plates No. 3 and 4. Listed below are fee-owned land allocations and their description:

Designation	Acreage	Cover	Elev.	Terrain
Reserved for Project Operations(Project Structures)	75	-	-	-
Permanent Pool	275	Open Water	518	N.A.
River	10	Open Water	518-575	N.A.
Huntington Access Site	25	Open	518-600	Rolling
Dayville Access Site	40	Open-Wooded	518-570	Rolling
Dayville Camping Area	40	Wooded	560-620	Rolling
General Reservoir Area	1165	Wooded		Rolling to Rugged

NOTE: The "general reservoir" area will be open to hunting, hiking, and other leisure time activities.

5-03. Plan of Improvement. Facility development at the reservoir will be limited to access areas at the lower and upper end of the permanent pool, a small picnic area, and an overnight group camping area. The greater portion of the reservoir area will remain undeveloped and will be open for hunting, hiking, fishing, and other leisure time activities. The development will be expanded based on experienced use and consistent with the water supply purpose of the project. Development details are shown on Plate 5.

a. Vicinity of the Dam. An access road with parking and turnaround areas has been provided along the top of the dam to facilitate viewing project structures. Sanitary facilities for use by the visiting public are available at the utility building. Picnic facilities are also available for visitors.

b. Huntington Access Area. This area provides access and a boat-launching lane at the lower end of the permanent pool. There will be parking for 58 cars, 38 with trailers. There is adequate area for expansion if experience indicates such need.

c. Dayville Access Area. This area will provide access and a boat-launching lane in the upstream area of the permanent pool. A parking area for 78 cars, 38 with trailers, will be available. A picnic area with 20 tables and 10 fireplaces and chemical toilet facilities will be developed.

d. Dayville Camping Area. The area is located in the upstream reach of the reservoir above spillway crest elevation. The main development of the area is for organized group camping with provision to adequately accommodate about 100 persons. Individual camp parties could also be accommodated. A gravel access road and a central gravel surfaced parking area for 20 cars will be provided. Access to the campgrounds will be by foot trails. A trail will also lead from the camp area to the shoreline of the permanent pool. Waterborne sanitary facilities will be provided.

5-04. Schedule of Development. Construction Design Memo No. IXB (C1) dated 19 July 1965 recommended construction of the facilities contained in this Master Plan and was approved by OCE 1st Indorsement dated 2 August 1965. The facilities will be constructed in the spring of 1966 and will be available for first use in the summer of 1967. Recent bid prices for similar work indicate an increase over prices current in July 1965. These changes are incorporated in Exhibit B, Estimate of Cost.

VI. RESERVOIR MANAGEMENT

6-01. General. The major uses of the reservoir area will be stream and lake fishing, controlled hunting, picnicking and camping. Picnicking and camping uses are expected to be of a minor scale due to the restrictions on use of project waters for swimming. Facility development of the project is considered to be minor and basic and not of the scope that would be classified as a Massachusetts State Park. Therefore, management and maintenance of the facilities will be by the Corps. Management of the fish and wildlife resources of the general reservoir area will be undertaken by the Massachusetts Division of Fisheries and Game under an appropriate lease arrangement.

6-02. Management by the Corps. Permanent personnel for the project includes a resident flood control operator and an assistant. To manage and maintain the recreational facilities at the reservoir and to assist the permanent employees with the increased summer workload, it will be necessary to employ 2 or 3 seasonal personnel in the summer season. The number of seasonal personnel will be based on the use experienced at the reservoir area.

6-03. Management by Others. The most valuable public use resource of the project will be the fishing offered by the 275-acre water area. A lease will be issued to the Massachusetts Division of Fisheries and Game for management and development of the fishing resource and the public hunting opportunities of the project lands.

6-04. Other Land Uses. The forestry resources of the project are good. However, it is not considered feasible to allow harvesting of this resource due to its value to public recreation. No significant mineral resources are available within the project area. Outleasing of project lands for agricultural or grazing purposes will not be allowed at the project.

6-05. Monumentation. Project boundaries will be established in accordance with current policies and as funds are available. Priorities will be given to boundaries adjacent to project structures, public use areas and improved lands in private ownership. Boundaries will be established in the early years of the project in order to utilize existing established bounds and lines and to eliminate encroachment by others.

VII. CONCLUSIONS AND RECOMMENDATION

7-01. Conclusions. The Littleville Reservoir, including the proposed pool area with attendant facilities, will be a valuable supplement to existing public recreation areas and will assist in meeting the ever-increasing demands for outdoor recreational opportunities.

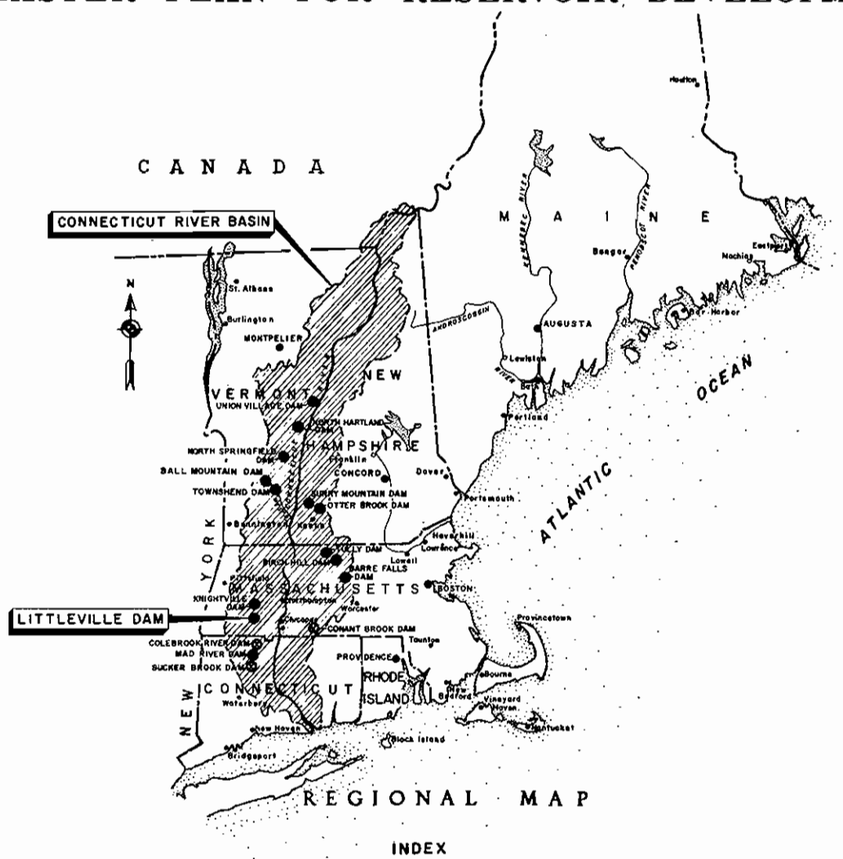
The proposed plan of improvement will utilize to best advantage project lands which are desirable for public access and recreation, and those lands which are desirable for public access and recreation, and those lands which are valuable for wildlife purposes.

The Master Plan has the general concurrence of Federal and State agencies who are interested in the development of the reservoir area for maximum public benefit.

7-02. Recommendation. It is recommended that this Master Plan for the development of Littleville Reservoir, Massachusetts, be approved.

MASTER PLAN DRAWINGS

CONNECTICUT RIVER FLOOD CONTROL
LITTLEVILLE RESERVOIR
MIDDLE BRANCH, WESTFIELD RIVER
MASTER PLAN FOR RESERVOIR DEVELOPMENT



REGIONAL MAP

INDEX

PLATE NO.

LEGEND

RESERVOIRS	COMPLETED	●
RESERVOIRS	UNDER CONSTRUCTION	⊗
RESERVOIRS	AUTHORIZED	○

CONNECTICUT RIVER FLOOD CONTROL
LITTLEVILLE RESERVOIR
MASTER PLAN
REGIONAL MAP & INDEX
MIDDLE BRANCH, WESTFIELD RIVER, MASSACHUSETTS

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS. JAN. 1966

CORPS OF ENGINEERS. U.S. ARMY

NUMBER	TYPE OF AREA	INDEX	FACILITIES PROVIDED: SWIMMING	BOATING	CAMPING	FISHING	HUNTING	HIKING	PICNICKING	SCENIC VIEWS	SKIING
	PUBLIC RECREATION AREAS										
	STATE PARKS										
	MASSACHUSETTS										
1	J.A. SKINNER	C-3						x	x	x	
2	J.C. ROBINSON	C-4	x			x		x	x	x	
3	WAHCONAH FALLS	B-2		x		x			x	x	
	CONNECTICUT										
4	CAMPBELL FALLS	B-4				x			x		
5	HAYSTACK MTN.	B-4							x		
6	DENNIS HILL	B-4							x		
7	PLATT HILL	B-4	x		x	x			x		
8	BURR POND	B-4	x	x	x	x			x		
9	MOHAWK MTN.	B-5							x		x
10	HOUSATONIC MEADOWS	A-5			x	x			x		
11	STRATTON BK.	B-5	x			x			x		
12	BOLTON NOTCH (UNDEVELOPED)	C-5									
13	TALCOT MTN	C-4									
14	PENWOOD	C-4							x		
15	MT. RIGA (UNDEVELOPED)	A-4									
	NEW YORK										
16	TACONIC	A-4	x	x	x	x		x	x	x	
17	LAKE TAGHKANIC	A-4	x	x	x	x		x	x	x	
	STATE FORESTS										
	MASSACHUSETTS										
18	CHESTER BLANDFORD	B-3	x			x		x	x	x	
19	O.A.R.	C-2	x			x		x	x	x	
20	GRANVILLE	B-4			x	x		x	x	x	
21	TOLLAND	B-4	x	x	x	x			x	x	
22	SANDISFIELD	B-4	x	x		x			x	x	
23	BEARTOWN	B-3	x	x	x	x		x	x	x	x
24	EAST MT.	B-3				x			x	x	x
25	BASH BISH FALLS	A-3				x		x	x	x	
26	OCTOBER MTN.	B-2			x	x		x	x	x	
27	CAMPBELL FALLS	B-4				x			x	x	
28	WINDSOR	B-2	x		x	x		x	x	x	
29	PITTSFIELD	B-2	x		x	x		x	x	x	x
30	WORTHINGTON (UNDEVELOPED)	B-2									
31	SAVOY	B-1	x	x		x		x	x	x	
32	MOHAWK TRAIL	B-1	x			x		x	x	x	
33	MUNROE	B-1				x			x	x	
34	ERVING	D-1	x	x	x	x			x	x	
35	MT. GRACE	D-1				x			x	x	x
36	MASS. FED. WOMENS CLUBS	D-2				x			x	x	
37	BRIMFIELD	D-4	x			x			x	x	
	CONNECTICUT										
38	ALGONQUIN	B-4				x			x		
39	TUNXIS	B-4				x			x	x	
40	PEOPLES	B-4				x			x		
41	AMERICAN LEGION	B-4				x			x		
42	HOUSATONIC	B-4				x			x		
43	HOUSATONIC	A-4				x			x		
44	NEPAUG	B-5							x		
45	PAUGNUT	B-5				x			x		
46	MOHAWK	B-5							x		x
47	NASSAHEGAN	B-5							x		
48	SHENIPSIT	D-4							x		
49	NYE HOLMAN	D-4				x			x		
50	NIPMUCK	D-4				x			x		
	N.E.D. RESERVOIRS										
	MASSACHUSETTS										
	EAST BRIMFIELD	D-3	x	x	x	x	x	x	x	x	x
	KNIGHTVILLE	D-3			x	x	x	x	x	x	
	CONNECTICUT										
	THOMASTON	B-5	x		x	x	x	x	x	x	x

LEGEND

- STATE PARKS
- STATE FORESTS
- N.E.D. FLOOD CONTROL DAMS
- STATE HIGHWAYS
- U.S. HIGHWAYS
- NATIONAL INTERSTATE HIGHWAYS

GRAPHIC SCALE

1" = NEARLY 5 MILES

CONNECTICUT RIVER FLOOD CONTROL
LITTLEVILLE RESERVOIR
MASTER PLAN
PUBLIC RECREATION AREAS
MIDDLE BRANCH, WESTFIELD RIVER, MASSACHUSETTS

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS. JAN. 1956
SCALE AS SHOWN

PLATE NO. 2

CORPS OF ENGINEERS

U.S. ARMY

MATCH LINE PLATE NO 4

FLOW LINE AT SPILLWAY CREST EL 576.0

LIMIT OF LAND OWNED IN FEE

EDSS HILL ROAD

PERMANENT POOL

EL 518.0 - 275 ACRES

(MAX WATER SUPPLY POOL)

HUNTINGTON ACCESS AREA

18' ACCESS ROAD (PAVED SURFACE)

TO HUNTINGTON

12' MAINTENANCE ROAD (PAVED SURFACE)

SPILLWAY CREST EL 576.0

UTILITY BUILDING & REST ROOMS

PARKING (35 CARS)

FLOOD CONTROL OUTLET

CONTROL WEIR EL 518.0

WATER SUPPLY INTAKE TOWER

PARKING (15 CARS)

SERVICE BRIDGE

DAM

WATER SUPPLY OUTLET

MIDDLE BRANCH WESTFIELD RIVER

TURNAROUND

OPERATOR'S RESIDENCE

16' MAINTENANCE ROAD (PAVED SURFACE)

TURNAROUND

FLOW LINE AT SPILLWAY CREST EL 576.0

LIMIT OF LAND OWNED IN FEE

LIMIT OF LAND OWNED IN FEE

LEGEND

FLOW LINE AT SPILLWAY CREST EL 576.0

LIMIT OF LAND OWNED IN FEE

SCALE IN FEET

400 0 200 400

CONNECTICUT RIVER FLOOD CONTROL

LITTLEVILLE RESERVOIR

MASTER PLAN

GENERAL DEVELOPMENT - LAND ALLOCATION

MIDDLE BRANCH, WESTFIELD RIVER, MASSACHUSETTS

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND

CORPS OF ENGINEERS

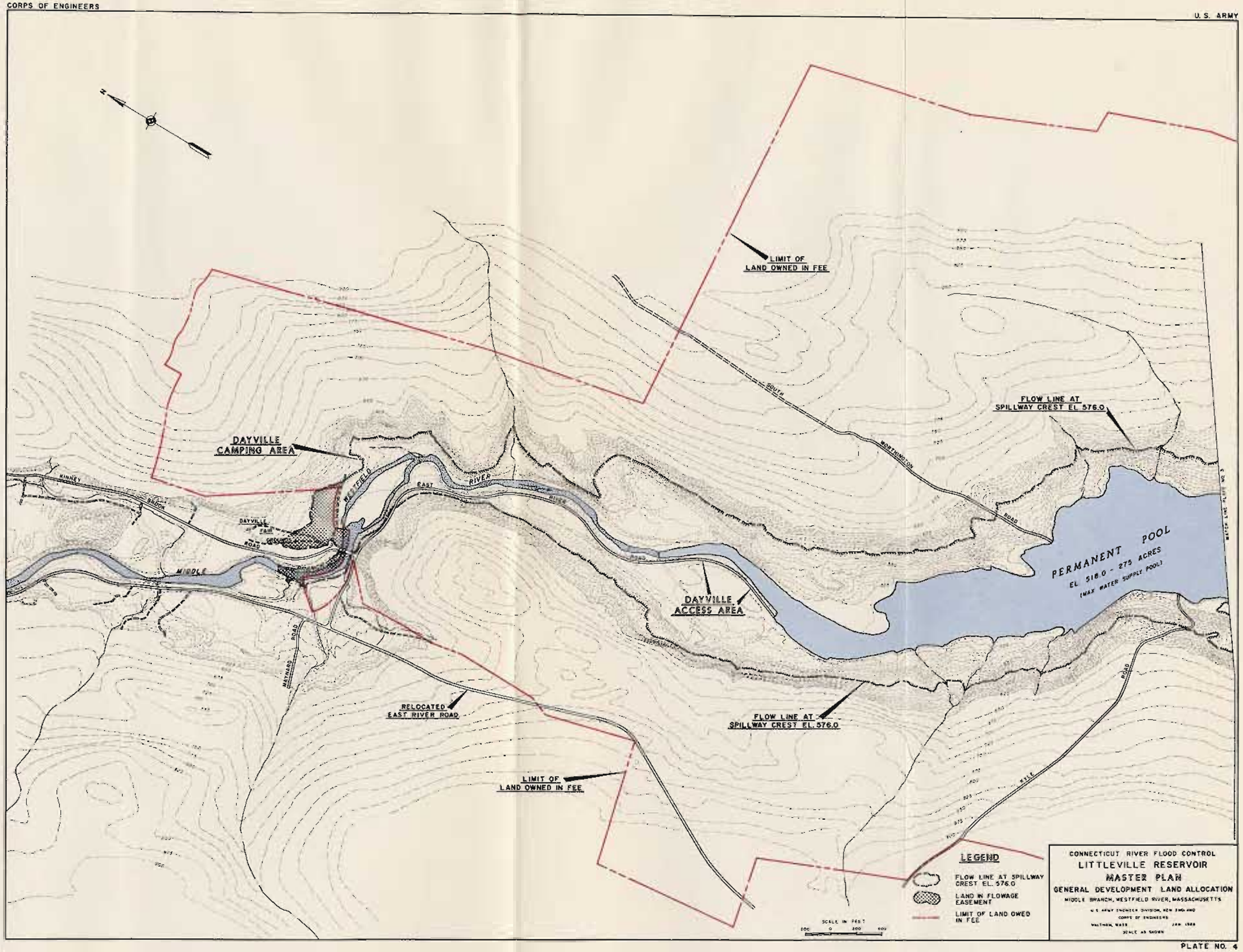
WALTHAM, MASS. JAN 1959

SCALE AS SHOWN

PLATE NO 3

CORPS OF ENGINEERS

U. S. ARMY



CONNECTICUT RIVER FLOOD CONTROL

LITTLEVILLE RESERVOIR

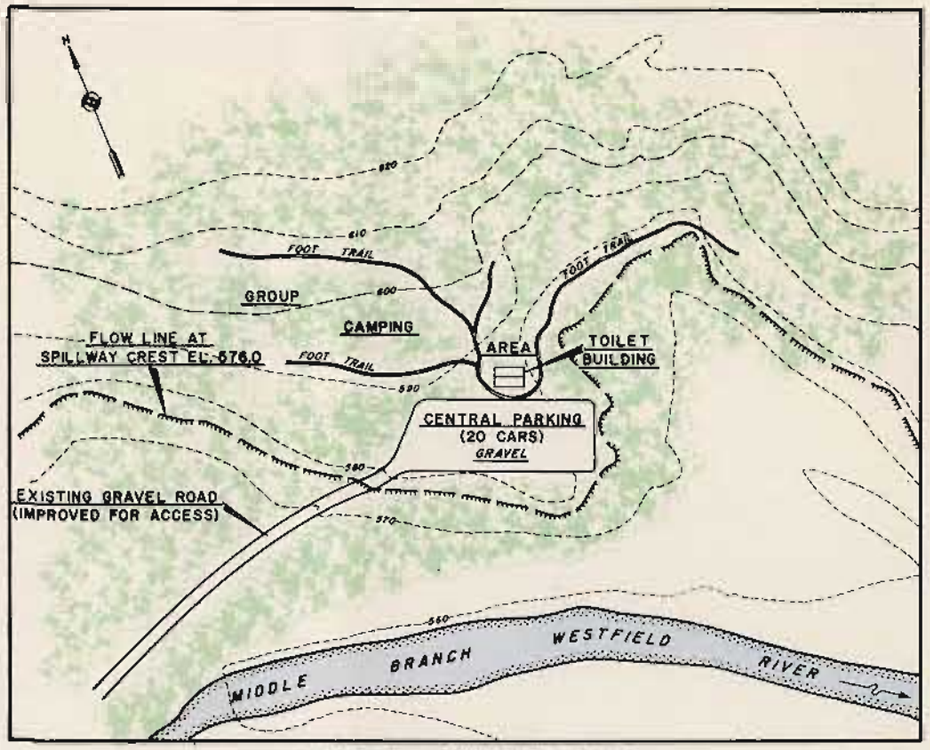
MASTER PLAN

GENERAL DEVELOPMENT LAND ALLOCATION

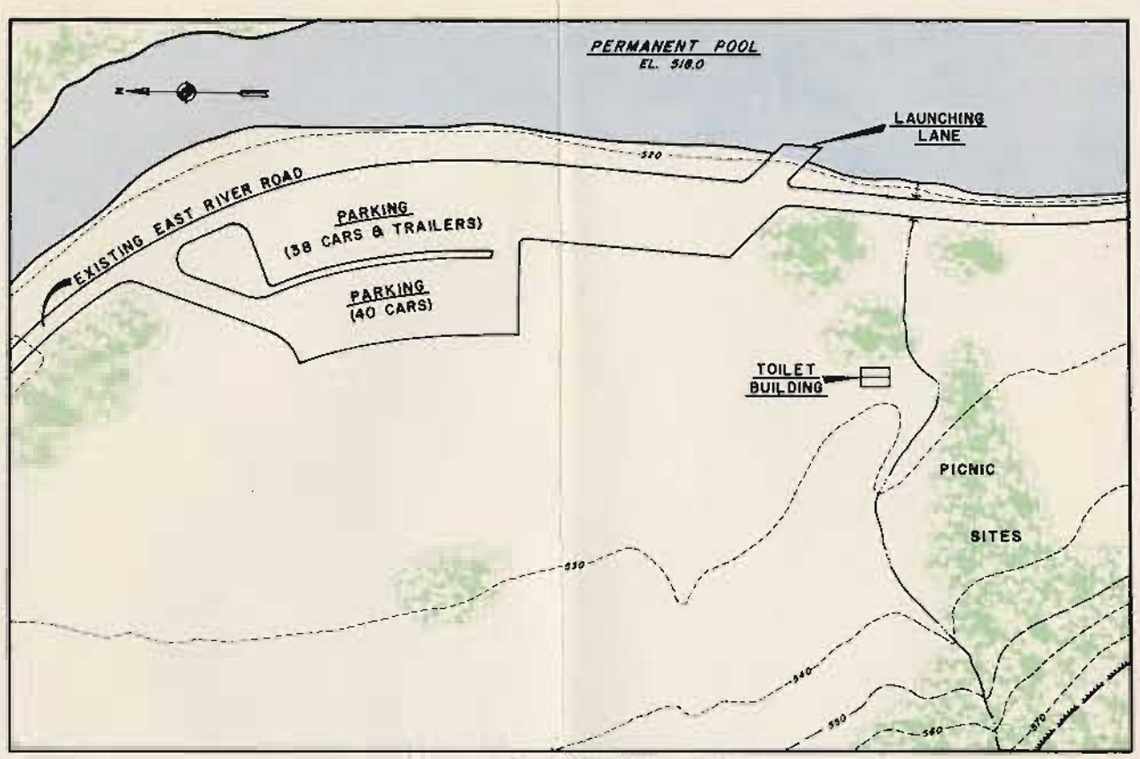
MIDDLE BRANCH, WESTFIELD RIVER, MASSACHUSETTS

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS. JAN. 1958
SCALE AS SHOWN

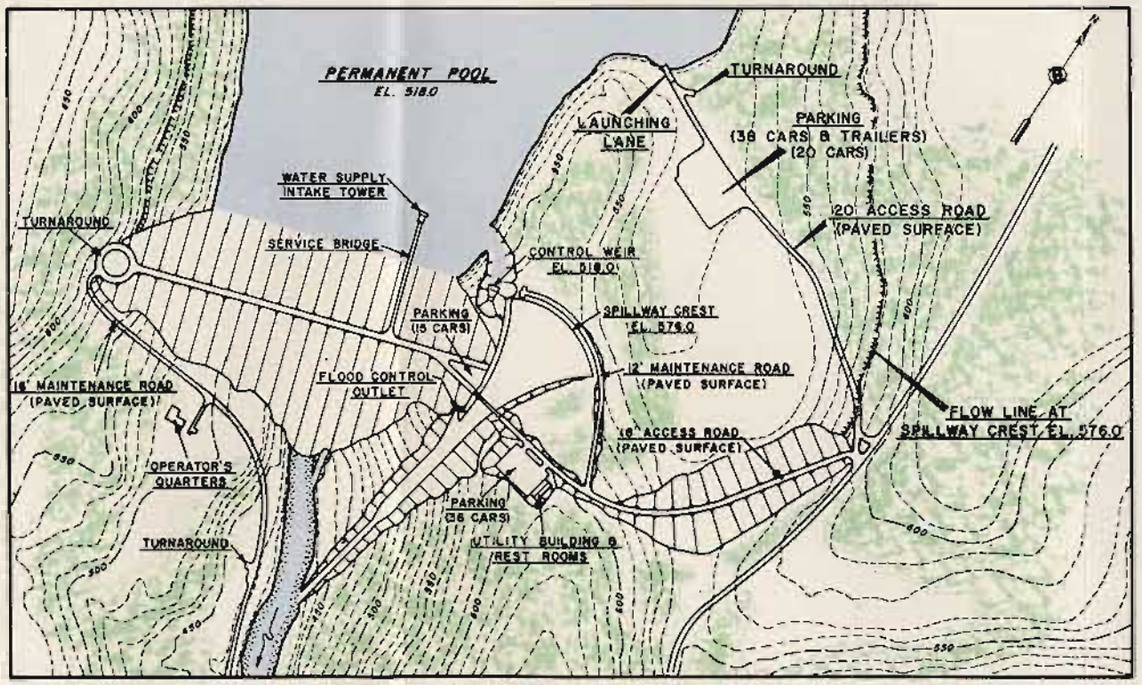
PLATE NO. 4



DAYVILLE CAMPING AREA
SCALE: 1" = 50'



DAYVILLE ACCESS AREA
SCALE: 1" = 50'



HUNTINGTON ACCESS AREA
SCALE: 1" = 200'

SCALE IN FEET
50' 0 50' 100'
200' 0 200' 400'

CONNECTICUT RIVER FLOOD CONTROL
LITTLEVILLE RESERVOIR
MASTER PLAN
DEVELOPMENT PLAN
MIDDLE BRANCH, WESTFIELD RIVER, MASSACHUSETTS

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS. JAN. 1964
SCALE AS SHOWN

PLATE NO. 5

EXHIBIT A

CONSERVATION AND DEVELOPMENT REPORT

ON THE

FISH AND WILDLIFE ASPECTS

OF

LITTLEVILLE DAM AND RESERVOIR

Prepared By The

U. S. FISH AND WILDLIFE SERVICE

In Cooperation With The

MASSACHUSETTS DIVISION OF FISHERIES AND GAME

ADDRESS ONLY THE
REGIONAL DIRECTOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
59 TEMPLE PLACE
BOSTON, MASSACHUSETTS

NORTHEAST REGION
(REGION 5)
MAINE
NEW HAMPSHIRE
NEW YORK
VERMONT
PENNSYLVANIA
MASSACHUSETTS
NEW JERSEY
RHODE ISLAND
DELAWARE
CONNECTICUT
WEST VIRGINIA

November 27, 1961

Division Engineer
New England Division
U. S. Corps of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Dear Sir:

This letter constitutes our conservation and development report on the fish and wildlife aspects of the Littleville Dam and Reservoir, Hampden and Hampshire Counties, Massachusetts. This report has been prepared in cooperation with personnel of the Massachusetts Division of Fisheries and Game and has the concurrence of that agency. Preliminary comments of the Service on the fish and wildlife resources of the project area were included in the NENYIAC report. This report evaluates fish and wildlife aspects of the project up to the time when the reservoir will be used for water supply. A further report will be prepared prior to initiation of use for water supply.

The Littleville Dam and Reservoir was authorized by the Flood Control Act of 1958 for the purpose of flood control. Since this project was authorized the City of Springfield, Massachusetts applied for water supply provisions in the project under the Water Supply Act of 1958. The project is now designed for flood control and water supply storage.

Upper portions of the Westfield River Watershed lie in the Berkshire highlands of western Massachusetts and are generally mountainous. The watershed has a maximum length of 48 miles, a maximum width of 20 miles, and drains approximately 517 square miles, emptying into the Connecticut River in West Springfield, Massachusetts. The three principal tributaries are the Westfield Little River, draining 84 square miles; the West Branch, draining 96 square miles; and the Middle Branch, draining 53 square miles. The Middle Branch flows generally southward and falls 1,100 feet in its 16-mile length. The Knightsville flood control dam is located on the Westfield River, three miles above the confluence of the Middle Branch.

EXHIBIT A

The Littleville Dam site is located on the Middle Branch of the Westfield River, approximately 1 mile upstream from its confluence with the main stem and about 2.7 miles upstream from Huntington, Massachusetts. The major part of the reservoir area is located in the town of Chester while the dam site lies on the boundary of Hampden and Hampshire Counties in Chester and Huntington. The Middle Branch flows through a narrow, steep-sided valley with a second or third growth forest cover of mixed hardwoods. There is a small acreage of open agricultural land, the majority of which is located in the upper portions of the proposed project area. The primary agricultural use of these areas is for corn and pasture production.

Project Plan

A rolled-earth and rock-covered dam with a length of 1,360 feet is being planned with a top elevation of 596 feet[1/] rising 164 feet above streambed elevation 432. The spillway will be located on the east bank and the crest elevation will be 576. The total capacity of the reservoir at spillway crest elevation will be 32,400 acre-feet of which 23,000 acre-feet between the top level of the water supply pool at elevation 518 feet and spillway crest are for flood control. Flood waters will be discharged through flood control outlet works consisting of a 374-foot tunnel, 8 feet in diameter, controlled by two 4 X 8-foot gates. The tunnel will be located on the east bank at a sill elevation near 518.0, 86 feet above stream bed elevation. A stop-log structure will be located in the intake for control of the pool level between elevations 518 and 531 feet.

The City of Springfield has requested that water supply storage be included in the reservoir for its future use. Storage will be provided for this purpose and, when filled to capacity, will form a 275-acre permanent pool with the surface elevation at 518 feet, 86 feet deep at the dam. Four 36-inch water supply intake gates will be located in an intake tower at elevations 447.0, 466.0, 485.0, and 504.0. Two 4 X 4-foot sluice gates will have a sill elevation of 432 feet. These gates will be operable only when the pool elevation is lowered to elevation 447. A 48-inch water supply pipe will pass through the base of the dam within a 9-foot diversion conduit. The space between the 48-inch water supply pipe and the 9-foot diversion conduit will be plugged upon completion of construction.

It is expected that Springfield will not need to draw water from the reservoir until about 1980; however, if necessary, the city has the option of taking water at any time prior to that date. Downstream flows will equal inflow, except for flood periods, until the reservoir comes into use for water supply. When the reservoir is being used for water supply, a minimum flow of not less than 5 c.f.s. will be maintained immediately below the dam.

1/ All elevations in this report are in feet and refer to mean sea level datum.

The permanent pool will be maintained upon completion of construction which is expected to be in 1965. This pool will be open for unlimited public recreation at least until used for water supply, at which time the State Department of Public Health will provide regulations to protect the water supply.

Land acquisition in fee will total approximately 1,640 acres. Land in excess of the 510-acre flood pool will be located on steep slopes contiguous to the pool and will have irregular boundaries.

Fishery Resources (Without the Project)

The Westfield River and its branches and tributaries are trout streams of statewide importance. The Middle Branch is of particular importance and is heavily used by stream fishermen. The use is attributed to three factors: very good access from paved roads, sizeable portions of the stream under lease by the State, and a heavy fish-stocking program. Approximately 11 miles of land bordering the stream are leased by the State for public angling, of which 3.4 miles are within the project area.

The Middle Branch now supports approximately 20 pounds of fish per acre, and is stocked each year with 15,000 catchable size trout. The Middle Branch within the town of Chester is stocked with an average of 4,200 trout annually, based on available figures for the past 10 years. Fishing pressure is heavy from opening day (third Saturday in April) to Memorial Day and tapers off to the middle of June after which there is very little fishing effort. The chief factors for the decline and absence of fishing during the summer months are low stream flow and warm-water temperatures which are unsuitable for trout.

The State Division of Fisheries and Game conducted a creel census of the Middle Branch in 1952. This census revealed that there was a total of 2,500 individual fishing trips that year of which 2,307 were made before June 15. The fishing pressure averaged 156 angler trips, or 406 hours of fishing per mile.

The Inter-Agency Committee on Water Resources has set a maximum value of $3.00 per angler-day for cold-water stream fisheries. This value is assigned to the Middle Branch because (a) it is readily accessible, thus providing fishing opportunities to many, (b) streams with comparable trout-fishing opportunities are not common in the State, (c) population expansion results in continually increasing demands for this type of recreation, and (d) the stream attracts fishermen from a large population, including the nearby cities of Springfield, Hartford, Westfield, Holyoke, Pittsfield, Chicopee, Northampton, North Adams, and Greenfield. Applying this figure to the 1952 data, the stream had a total recreational value of $7,500 that year, or $486 per mile.

Fishery Resources (With the Project)

Construction and operation of this project will be detrimental to the existing fishery resource during the actual construction phase and possibly afterwards, depending upon the method of reservoir operation. Some damages to the habitat from siltation downstream from the dam site as a result of construction operations, including the removal of topsoil, are usually unavoidable.

Within the permanent pool, 2.5 miles of the Middle Branch will be permanently inundated and lost. Up to 0.9 additional miles of stream would be lost temporarily while the reservoir is storing floodwaters.

It is expected that the permanent pool will provide suitable habitat for trout. This will produce major benefits to the fishery resource which will more than compensate for losses to the stream fishery. The Division of Fisheries and Game has found that fishing pressure on ponds managed for trout exceeds 200 hours per acre while pressure on warm-water ponds averages 50-60 hours per acre per year. A 127-acre trout pond, lying a similar distance from population centers as the Littleville Reservoir site, provided 38,656 fishing hours or 304 hours per acre, during one season. It has also been found that the average fishing day is 3.1 hours. It is anticipated that fishing pressure on the 275-acre permanent pool will amount to at least 83,600 hours per year, or about 27,000 angler-days per year. Applying the figure of $3.00 per angler-day, the reservoir fishery will have a recreational value of $81,000 per year.

Until the reservoir is used for water supply, the pool level will be maintained by releasing incoming flows from the pool surface at elevation 518. The temperature of the warmer surface water will probably be above the optimum for downstream trout survival and growth. However, this would probably not significantly affect downstream trout fisheries since, under existing conditions, stream temperatures reach high levels.

Wildlife Resources (Without the Project)

Several wildlife species range over the project area. However, their aggregate values are low. The only big game animal present is the white-tailed deer. Upland species include varying hare, gray squirrel, cottontail, ruffed grouse, raccoon, and woodcock. A few pheasants are stocked in the limited suitable agricultural coverts. A small number of furbearers, including muskrat, mink, and beaver, is found in the valley. Deer-hunting pressure is heavy throughout the valley, whereas hunting pressure on upland species is light.

Wildlife Resources (With the Project)

The loss of wildlife habitat by the permanent inundation of 275 acres is expected to be insignificant. The permanent pool will probably attract migrating waterfowl and provide some opportunity for waterfowl hunting.

Of greater significance for future use is the opportunity to assure public access for hunting on approximately 1,000 acres to be taken in fee excluding the dam site and the permanent pool area.

Discussion

At the present time, Massachusetts is attempting to provide adequate sports fishing in a small and densely populated state. Within a 30-mile radius of the project there is a population of over 500,000. This includes the cities of Springfield, Chicopee, Northampton, Holyoke, Westfield, Pittsfield, North Adams, and Greenfield. The 1960 National Survey of Fishing and Hunting revealed that in New England 14% of the population fished and 6% hunted. This indicates that there was a potential of over 70,000 fishermen and 30,000 hunters within a 30-mile radius of the project.

The State Division of Fisheries and Game and this Bureau believe that hunting and fishing on watersheds are compatible with the use of the watershed for domestic water supplies. A significant loss of fish and wildlife utilization would result if the Littleville Reservoir and its watershed were closed to hunting and fishing when the permanent pool is utilized for domestic water supplies.

A. Public Access

Public access to the permanent pool, watershed, and tributaries is required to realize maximum benefit to fish and wildlife from this project. Public access for these purposes should be maintained indefinitely, regardless of the time when the pool is used for water supply.

It is estimated that project lands, excluding the permanent pool, the dam site, and an area reserved for reasons of safety, efficient operation, or protection of public property, would total about 1,000 acres. While intensive wildlife management on these lands is not practical due to rugged topography, the existing wildlife resource is important because it provides a considerable amount of hunting opportunity. Although it is felt that the existing resource could not absorb much more hunter pressure, the loss of the existing opportunity would be significant, especially in view of the proximity of several cities with large populations. The permanent pool would also provide some benefits by increasing opportunity for waterfowl resting and feeding and for a small amount of waterfowl hunting. Project lands and waters should be made available to the Massachusetts Division of Fisheries and Game for fish and wildlife management purposes as a public hunting and fishing area under a General Plan for fish and wildlife management.

B. Boat-launching and parking facilities

Utilization of the permanent pool for fishing and other recreation will depend upon adequate access. Two areas, with boat-launching ramps and a minimum of two acres for parking of vehicles at each site, should be provided. One site

should be located at the upstream end of the permanent pool. It appears that development of this site, using the existing East River Road at the upstream margin of the permanent pool as a ramp, would be feasible. The other site should be located at the downstream end of the reservoir near the dam. At this time it appears that the most feasible site would be off the planned maintenance road running from the access road along the top of the dam to the flood control inlet.

C. Reservoir use restrictions

Since there are few lakes or ponds of the size of the proposed permanent pool open to public use in this section of Massachusetts, heavy use of the permanent pool for water-associated recreational activities is expected from nearby population centers. It appears that a plan to allow maximum public use will be highly desirable. It has been found that angling opportunity may be significantly reduced by interference from other recreational uses. For example, it has been estimated that one water skier and tow boat require 20-50 acres in which to operate; the same area could provide recreation for 40-150 anglers in 20-50 boats. Unless other water activities are held in check, angling opportunities provided by the permanent pool may be significantly reduced. If the size of boat motors allowed on the pool is limited to a maximum of 10 horsepower, the pool will produce a maximum of public recreational benefits and man-days per use per acre of water. Such limitation will also contribute to the safety of the recreational activities.

D. Stream reclamation

The Massachusetts Division of Fisheries and Game has had considerable success with the technique of chemically reclaiming streams to improve trout habitat. Following this treatment the stream is then stocked with trout--often the less expensive fingerling sizes--and the trout have a better chance to survive without predation by other fish; also, their growth rate improves due to the reduction of competition. Application of stream reclamation of the Middle Branch in connection with reservoir construction will improve the trout fishing potential.

The reclamation would best be accomplished after the project is constructed and while the permanent pool is being filled. The gates to hold the pool would be closed when reclamation is carried out, thus impounding the water to be treated. To effectively plan the treatment, the sponsoring agency should notify the Division of Fisheries and Game 30 days before final closing of the gates to give adequate time to prepare for the reclamation job. The Division will bear the cost of stream reclamation.

E. Downstream Flow Regulation

Stream flows in the Middle Branch are highly variable. During the 49-year period of record, instantaneous stream flows varied from practically no flow to 19,000 c.f.s. The average flow for the period was 104 c.f.s. The maximum annual average flow occurred in 1955 and was 164 c.f.s., and the minimum average annual flow was 54.4 c.f.s. in 1941. During the critical summer and early fall months, flows in the Middle Branch generally range from zero up to 100 c.f.s.

The major habitat conditions affecting trout in the Middle Branch and in the Westfield River are low summer flows and high stream temperatures. Trout are intolerant of temperatures above 65-70 degrees F. and thrive best when water temperatures are between 50-60 degrees. Water in the permanent pool, with a depth of 86 feet at the dam, would probably range in summer temperatures from 70-80 degrees F. at the surface to 50-60 degrees F. near the bottom. Cold water drawn from the intake at elevation 466 (52 feet below the surface) would cause a significant reduction in temperatures in downstream areas. This would significantly benefit downstream trout habitat conditions except during periods of zero flow. Benefits to this trout fishery would include an extension of satisfactory angling after the middle of June and an improvement of environmental conditions.

Outflow water from the gate at elevation 466 may contain reduced amounts of dissolved oxygen. If the water released at elevation 466 is deficient in oxygen, it is believed that it will re-aerate within the mile of stream between the dam and the main stem (gradient 35 feet per mile), or when it mixes with the higher flows (3-4 times greater) of the main stem.

To accomplish maximum possible fisheries benefits in the permanent pool and downstream, a reasonably stable pool level should be maintained and water should be released through the gate at elevation 466. We understand that this gate can be used until such time as water supply goes into effect. The gate should be operated to pass not more than 100 cubic feet per second when inflow exceeds this amount. Water in excess of 100 cubic feet per second would be released through the outlet works at elevation 518. When inflows are less than 100 cubic feet per second, the gate should be operated to pass an amount equal to the inflow. Thus, when there is no inflow, no water would be released from the gate. Flows in the Middle Branch equal 5 cubic feet per second or less about 4 percent of the time on the average, or about 15 days per year. When the flow reaches zero, any stream fishery remaining in the mile of stream between the dam and the main stem would be practically eliminated. However, the reservoir pool level would be maintained.

If cold-water releases improve habitat conditions downstream from the dam site as anticipated, it is estimated that fishing pressure will increase approximately 25%. There are approximately nine miles between the proposed dam and the dam at Woronoco. If stream conditions improve throughout this reach, it is expected that angling benefits will be valued at $1,000 per year assuming existing fishing pressure is similar to that found on the Middle Branch.

F. Re-evaluation of Project

It is difficult to predict specific chemical and physical conditions which will occur within the proposed pool. Therefore, modifications in operation may be necessary after the project is operating to provide maximum benefits. The Massachusetts Division of Fisheries and Game and this Bureau would recommend such modifications if found necessary.

At this time it is impracticable to predict the effect on the fishery resource of water withdrawals which may not be made until 1980. Therefore, we are recommending that the proposed operation of the project for water supply be reviewed by this Bureau and the State Division of Fisheries and Game, prior to such use, and a special report prepared. The special report will evaluate fish and wildlife resources under new project conditions and contain recommendations designed to obtain maximum fish and wildlife benefits. The special report will be prepared by the Massachusetts Division of Fisheries and Game and this Bureau, and the recommendations will be coordinated with the City of Springfield, the Massachusetts Water Resources Commission, and the Corps of Engineers. Several months prior to utilization of the reservoir for water supply we will request you to provide us with your planned new operating schedules which will be needed for our new evaluations.

Recommendations

We recommend--

1. That project lands and waters be open to free use for hunting and fishing except for sections reserved for safety, efficient operation, or protection of public property.

2. That public access and boat-launching facilities be provided at Federal cost in the vicinity of the dam site and at the upstream end of the reservoir.

3. That motors on boats using the permanent pool be limited in size to a maximum of 10 horsepower.

4. That chemical reclamation of the Middle Branch above the dam site be carried out by the Massachusetts Division of Fisheries and Game after construction is completed.

5. That a minimum instantaneous discharge into the Middle Branch be provided equal to the natural flow or 100 cubic feet per second, whichever is less; this flow to originate at elevation 466, until such time as the reservoir is used for water supply.

6. That operation of the reservoir be re-evaluated and modification made cooperatively by this Bureau, the Massachusetts Division of Fisheries and Game, the City of Springfield, the Water Resources Commission, and the Corps of Engineers, as is found necessary after the project is operating, and prior to use of the reservoir for water supply.

7. That project lands and waters be made available to the Massachusetts Division of Fisheries and Game for fish and wildlife management purposes in accordance with a General Plan as provided in Section 3 of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended, 16 U.S.C. 661 et seq.), except for sections reserved for safety, efficient operation, or protection of public property.

8. That additional detailed studies of fish and wildlife resources affected by the project be conducted as necessary during further planning and construction phases of the project to form a basis for such reasonable modifications for the conservation and development of fish and wildlife resources as may be desirable to obtain maximum over-all project benefits.

Sincerely yours,

E. W. Bailey
Acting Regional Director

EXHIBIT B

ESTIMATE OF COST

ESTIMATE OF COST

DAYVILLE ACCESS AREA

Item	Unit Price	Quantity	Cost	
Car and Trailer Parking Area	$ 4.00	4,500 s.y.	$ 18,000	18.0
Boat Launching Ramp	3,000.00	Job	3,000	3.0
Picnic Tables - concrete	135.00	30 ea.	4,050	
Fireplaces - concrete	75.00	15 ea.	1,125	
Chemical Toilet	15,000.00	1 ea.	15,000	15.0
Drinking Water	2,000.00	Job	2,000	
Total Dayville Access Area			$ 43,175	

HUNTINGTON ACCESS AREA

New Road	$ 11.00	1,600 l.f.	$ 17,600	17.6
Car and Trailer Parking Area	3.00	4,000 s.y.	12,000	12.0
Boat Launching Ramp	3,000.00	Job	3,000	3.0
Total Huntington Access Area			$ 32,600	69.6

DAYVILLE GROUP CAMPING AREA

Gravel Road	$ 2.00	1,500 l.f.	$ 3,000
Gravel Parking Area	2.00	1,100 s.y.	2,200
Select clearing & trail development	300.00	20 acres	6,000
Drinking Water	2,000.00	Job	2,000
Waterborne Toilet	20,000.00	1 ea	20,000
Picnic Tables-Concrete	135.00	10 ea	1,350
Fireplaces - Concrete	75.00	10 ea	750
Total Dayville Group Camp Area			$ 35,300

SUMMARY OF COST

Dayville Access Area		$ 43,175
Huntington Access Area		32,600
Dayville Camping Area		35,300
	Total	$ 111,075
	Contingencies	11,925
	Total	$ 123,000
	E&D and S&A	22,000
		$ 145,000