COLEBROOK RIVER LAKE

COLEBROOK, CONNECTICUT

SANDISFIELD AND TOLLAND, MASSACHUSETTS

FOREST MANAGEMENT PLAN

MASTER PLAN APPENDIX B

AND

FISH AND WILDLIFE MANAGEMENT PLAN

MASTER PLAN APPENDIX D

Department of the Army
New England Division, Corps of Engineers
Operations Division
Waltham, Massachusetts

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The objectives of this plan are to outline management practices which are compatible with flood control operations and multiple-use programs, and provide for sound ecological management of forest, wildlife, and water resources in the future.

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NEDOD-P	Master Plans, Appendices B & D, Forest, Fish and Wildlife Management Plan, Colebrook River Lake

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SEE DISTRIBUTION	Acting Chief, Operations Division	21 May 1982 Mr. Mitchell/lr/305	

1. The subject appendices, prepared in accordance with ER 1130-2-400, dated May 1971, has been approved by the Division Engineer.

2. The plan has been developed to increase the value of reservoir lands for recreation and wildlife, and to promote natural ecological conditions by following accepted conservation practices.

3. This plan has been developed in coordination with the Connecticut Department of Environmental Protection, the Hartford Metropolitan District Commission and the Massachusetts Division of Fisheries and Wildlife for their review comments of this plan.

4. This plan should serve as an information copy.

Incl
as

J. C. WONG
Acting Chief, Operations Divison

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TO Division Engineer

FROM Acting Chief, Operations Division

DATE 17 May 1982 Mr. Mitchell/lr/305

CMT 1

1. Inclosed for your approval is the Forest and Fish and Wildlife Management Plan for Colebrook River Lake. This plan will serve as Appendices B and D to the Master Plan for this project.

2. It has been prepared in conjunction with ER 1130-2-400, dated 28 May 1971. It has been reviewed by NED Planning and Real Estate Divisions; and the Connecticut Department of Environmental Protection, the Hartford Metropolitan District Commission and the Massachusetts Division of Fisheries and Wildlife.

3. Division Engineers have been designated as approval authority for these plans by ER 1130-2-400. Information copies are to be forwarded to OCE upon approval.

Incl
as

J. C. Wong

J. C. WONG
Acting Chief, Operations Division

NEDDE

TO Acting Chief, Operations Division

FROM Division Engineer

DATE 19 May 82

CMT 2

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C. E. Edgar III

C. E. EDGAR, III
Colonel, Corps of Engineers
Division Engineer

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COLEBROOK RIVER LAKE

COLEBROOK, CONNECTICUT

SANDISFIELD AND TOLLAND, MASSACHUSETTS

FOREST MANAGEMENT PLAN

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AND

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MASTER PLAN APPENDIX D

Department of the Army
New England Division, Corps of Engineers
Operations Division
Waltham, Massachusetts

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Mr. Joe Faloretti - Park Ranger, NRB

Mr. Doug Cleveland - Planning Division

Mr. Russell Keeler - Real Estate Division

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SECTION 1. INTRODUCTION

Purpose

The land and water resources of Colebrook River Lake are valuable environmental assets to the people of the surrounding areas providing recreational opportunities, and conservation and protection of the resources within the project.

The purpose of this plan is to set forth guidance for the continuing wise management of the natural resources of the project, to enhance recreational and aesthetic values, and to protect the environment. This plan identifies forest, wildlife and fishing resources, factors affecting these resources, and it establishes recommendations to carry out management objectives.

Authority

This management plan is authorized under ER 1130-2-400, dated 28 May 1971. It combines into one document the Forest Management Appendix B, and the Fish and Wildlife Management Appendix D to the "Public Use Plan for Reservoir Development," for the Connecticut River Basin, April 1970.

Management Objectives

The objectives of this plan are to outline management practices which are compatible with flood control operations and multiple-use programs at Colebrook River Lake, and to provide for sound ecological management of forest, wildlife and water resources in the future.

Primary objectives are to protect and enhance aesthetic and habitat values; provide for a variety of recreational uses of project natural resources, including hunting, fishing, day use, nature observation and interpretation; and where compatible, provide forest products for project, national defense, and commercial purposes.

Coordination

This plan was coordinated with the Soil Conservation Service, U.S.D.A., Litchfield County, Connecticut; the Connecticut Department of Environmental Protection; the Hartford Metropolitan District Commission, and the Massachusetts Division of Fisheries and Wildlife. These and other agencies and interested groups will be consulted on the implementation of the plan.

SECTION 2. PROJECT DESCRIPTION

Location

Colebrook River Lake is located in northwestern Connecticut and southwestern Massachusetts in the towns of Colebrook, Litchfield County, Connecticut and Sandisfield, Berkshire County, and Tolland, Hampden County, Massachusetts. The project is situated on the West Branch of the Farmington River, which is the fourth largest tributary watershed in the Connecticut River Basin. The dam site is about 4 miles upstream from the confluence with the Still River at Riverton, Connecticut, and approximately 2 miles south of the Massachusetts state line. Colebrook River Dam was constructed within the water supply pool of the West Branch Reservoir, which is formed by Goodwin Dam about 7,000 feet downstream and is owned by the Metropolitan District Commission of Hartford. Access to the area is via Massachusetts and Connecticut State Route 8 from the north and south and U.S. Route 44 from the east and west.

Acquisition

Colebrook River Lake was authorized by the Flood Control Act of 1960 Public Law 86-645, (86th Congress) as a part of 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 761, 75th Congress, Third Session), as amended. The project provides water supply storage for the Metropolitan District Commission, Hartford County, Connecticut in accordance with the provisions of the Water Supply Act of 1958 (Public Law 85-500, 85th Congress, First Session).

Also provided is conservation storage of 10,000 acre-feet for fish and wildlife improvement downstream. Of this, 5,000 acre-feet of storage was authorized by the Fish and Wildlife Coordination Act approved August 12, 1958 (Public Law 85-624, 85th Congress) and another 5,000 acre-feet is included in the flood control pool on a seasonal basis and is allocated for shad fishery improvement.

Authorization for the development and use of the reservoir area for public recreation and other uses is contained in Section 4 of the Flood Control Act of 1944 (Public Law 534, 78th Congress, Second Session), as amended, and Public Law 89-72.

Land acquired for the project totals 1,618 acres, of which 1,230 acres consist of easements for flowage purposes on land owned by the Hartford Metropolitan District Commission and the Connecticut State Park and Forest Commission. The remaining 388 acres are owned in fee by the Federal Government. The area around the dam and dike consists of about 217 acres and the other 171 acres include the boat ramp area and the upper end of the reservoir located in Massachusetts.

Construction of the project was initiated in April, 1965 and completed in June, 1969 with a total cost of $13,170,000 including recreational facilities.

General

The project's primary purpose is to reduce flooding in the downstream communities along the Farmington River. It also helps to desynchronize flood flows in the Connecticut River.

A preliminary feasibility study to include generation of hydropower as an authorized purpose of the project has been conducted (see Section 8 of this plan).

The outlet works consist of a gate chamber, control tower, and operating house on the upstream side of the dam. A 10 foot diameter discharge tunnel passes through the dam's foundation and empties into the West Branch Reservoir at the downstream toe of Colebrook River Dam. The gate structure contains three 4-foot by 8-foot hydraulically-operated vertical sluice gates for regulation purposes and three similar-sized standby gates arranged in series.

The reservoir at spillway crest elevation (761 feet N.G.V.D.) has a storage capacity of 97,700 acre-feet, equivalent to 15.52 inches of runoff from an upstream drainage area of 118 square miles. At crest elevation, the area of the lake would encompass 1,185 acres.

The gross storage capacity also includes 50,200 acre-feet for flood control purposes (including 5,000 acre-feet for shad fishery improvement), 5,000 acre-feet for downstream trout fishery improvement (low flow augmentation), and 1,000 acre-feet of dead storage.

The reservoir, when full, extends upstream along the West Branch of the Farmington River nearly 6 miles into the towns of Tolland and Sandisfield, Massachusetts. Colebrook also exists as a secondary water supply source.

History

The Farmington River Watershed can be divided into two distinct areas, the northern or industrial area (Massachusetts and Litchfield County, Connecticut) and the southeastern or agricultural area.

Much of the forested area in the southeastern portion of the watershed, generally along that part of the Farmington River which flows in a northerly direction, was cleared by settlers for farming and pasture from the mid 1600's until about 1850. Some of the richest farmland in the State of Connecticut can be found in this area.

Agriculture is limited in most of the northern areas of the project because of rocky or swampy conditions and the uneveness of the terrain. Most of the rural land in this area is in woodland and pasture.

The northwestern part of Connecticut is one of the most sparsely populated regions of the State and has been since it was first settled. After forested lands suitable for agricultural use were cleared, minimal demand was placed on the forests of the project area. Wood products were harvested primarily for fuelwood and domestic use.

Abundant water power, wood resources and lack of suitable agricultural land led to the development of industry in the towns in the immediate vicinity of the project. Many of the towns rely upon small industry as a source of employment. A major portion of the industrial activity is located in Winsted, where clocks and electrical products are manufactured. Industrialization and urbanization have had a limited effect on the forest resources in the project area. Agricultural use has declined steadily since 1850 with much of the cleared land reverting back to forest.

In 1949, the Hartford Metropolitan District Commission was authorized to construct a dam on the West Branch of the Farmington River. At the time, northwestern Connecticut was sparsely populated; only 60 families, in the village of Colebrook River, lost their homes to the 4,750 acre West Branch Reservoir and Watershed.

Colebrook River Dam was constructed within the existing West Branch Reservoir and therefore had little effect on the forest resources of the area.

Today there is a resurgence of the wood products industry in the States of Connecticut and Massachusetts, as well as a rapidly growing demand for fuelwood. According to the most recent U.S. Forest Service resource survey, annual forest growth continues to exceed the amount harvested. The possibility of significantly increasing wood production and utilization through sound management for a variety of benefits is receiving greater emphasis.

SECTION 3. PHYSICAL AND ECOLOGICAL CHARACTERISTICS

Topography

Colebrook River Lake is characterized by steeply sloping hills separated by narrow valleys, some of which contain scattered swamps and ponds. Elevations within the immediate vicinity of the reservoir range from 570 feet N.G.V.D. at the dam to about 1,300 feet N.G.V.D. at the top of the adjacent hills and ridges. A very high percentage of the area is wooded and five State forests are located within 10 miles of the dam.

The project is irregularly shaped, being approximately 6 miles long with an average width of about 1/2 mile.

The project encompasses 388 acres which are in Federal ownership and 1,230 acres in flowage easements. Of the total project acreage, there are approximately 229 acres of woodland, 10 acres of wetlands, and 83 acres of open land. The riverbed occupies approximately 12 acres and the water supply pool about 760 acres.

Climate

The climate of the Farmington River watershed is generally moderate, but varies somewhat in its northern and southern extremeties. Four distinct climatic seasons occur, typically reflecting a pattern ranging from relatively warm summers to cold winters. The climate of the southern part of the watershed reflects the effect of lower elevations and is comparable to the climate of the southern Connecticut River valley. The climate in the headwater's northern sections in Massachusetts is affected by the rugged topography and higher elevations.

The region lies in the path of the "prevailing westerlies" which often includes cyclonic disturbances that cross the country from the west or southwest. It is also exposed to coastal storms, some of tropical origin, that travel northward along the eastern seaboard. In late summer and autumn, storms attaining hurricane intensity occasionally affect the area. The last major hurricane to strike the river basin was in 1955.

The average annual temperatures vary from 45°F in the mountainous regions of the watershed to 50°F in the valleys. The temperature extremes at representative stations within or adjacent to the Farmington River watershed range from a maximum of 120°F during the summer to a minimum of -29°F in the winter. Freezing temperatures have been experienced from the latter part of September until the end of May.

The mean annual precipitation varies from approximately 44 inches in the northern and central portions to approximately 42.5 inches in the southern section and is distributed uniformly throughout the year. The maximum and minimum annual precipitation amounts recorded are 68.6 and 29.1 inches respectively.

The average annual snowfall ranges from about 70 inches in the headwaters to approximately 40 inches in the lower sections of the watershed. The average annual snowfall recorded at West Otis, Massachusetts for the 29 years of records through 1968 is 66.7 inches. At Hartford, Connecticut, the recorded average annnal snowfall is 43.1 inches. Water equivalent of the snowpack usually reaches a maximum during the early part of March, and for the last 13 years (from 1960) has averaged 2.3 inches with a maximum of about 5.5 inches.

Geology and Soils

The West Branch of the Farmington River flows through the western highlands of Connecticut, a rugged, naturally dissected upland of moderate relief underlain by crystalline rock. It is a region of rough, irregular hills and ridges with relatively deep, steep-sided valleys. Glaciation has modified the rougher topography by rounding and smoothing the crests of the hills and ridges, steepening some of the valley walls, and filling the valley bottoms. A generally thin veneer of till covers the hills and ridges between extensive areas of exposed bedrock. Glacial till occurs in the valleys which are filled with outwash material forming relatively wide, flat flood plains and extensive terraces along the lower valley slopes. Where not masked by till or terraces, numerous and persistent outcrops of bedrock occur along the flanks of the hills, and in the valleys. Bedrock of the region consists of Paleozoic schist, gneisses and granites.

There are no known commercial mineral extraction operations in the local vicinity of the project. The extensive deposits of sand and gravel in the valley were utilized in construction of the Goodwin Dam but are not operated for local or commercial uses.

The valley is constricted at the dam site by the high, steep hills which form the abutments of the dam. The south abutment is thickly wooded and rises very steeply to heights far above the top of the dam. On the north abutment, bedrock is exposed in steep, rough faces.

The soil association which occurs in the reservoir area is Charlton-Paxton-Hollis: gently sloping to steep, well drained, deep soils that formed the glacial till and are somewhat excessively drained. This association is nearly level or gently sloping in the narrow valleys and is gently sloping or undulating to steep in the uplands. These soils are easy to work and their available water capacity is moderate. Water moves through them fairly rapidly. Hollis soils are commonly covered with stones and boulders with a seasonal high water table sometimes common.

Terrace soils (Hinckley and Merrimac) occur in scattered areas above the flood plain in narrow stream valleys. These soils are moderately well drained fine sandy loams with a rather high water table throughout the year. Slopes are less than 15 percent. Both the moisture holding capacity and natural fertility of these soils are low.

Flood plain soils (Rumney and Podunk) are poorly to very poorly drained fine sandy loam. A water table remains within 6 inches of the surface during the wettest part of the year. These soils are poorly suited for wildlife in the spring.

Existing Management

Most of the forest surrounding Colebrook River Lake is owned and managed by the Hartford Metropolitan District Commission (MDC), and the State of Connecticut. Approximately 80 percent of the land aquired for the project is in the form of flowage easements on MDC and State-owned lands. The 388 acres of land owned in fee are managed by the Corps of Engineers.

Forest Resources

Colebrook River Lake is located in the northeastern section of The Central Forest Region of North America. There are four forest cover types which can be found on the project fee lands.

The primary cover type at Colebrook is Society of American Foresters (SAF) Type 25; sugar maple-beech-yellow birch (*Acer saccharum* - *Fagus grandifolia* - *Betula alleghaniensis*) which cover 96.4 acres or 42 percent of the forested area of the project fee lands. Sugar maple, beech and yellow birch are the component species with common associates including mixtures of basswood, red maple, hemlock, northern red oak, white pine, black cherry, paper birch, black birch, Americana elm, red spruce and white spruce.

This type occurs throughout the Northern Forest and extends into the northern limits of the Central Forest region. In New England it can be found at elevations up to 2,500 feet and prefers loamy fertile soils and good moisture conditions but may extend into quite sandy soils. The type is climax and covers extensive areas, except where the forest is broken by settlement.

SAF Type 52; white oak-red oak-hickory (*Quercus alba*-*Quercus rubra*) is found on 61.4 acres or 27 percent of the forested fee lands. This type is primarily composed of white oak, red oak and hickory with northern red oak predominant at Colebrook. Some common associates in New England may include northern pin oak, shagbark or butternut hickory, white or green ash and occasionally a few butternut, bigtooth aspen, and red maple. This type is widespread through the Central Forest at elevations from 500 to 2,000 feet, and occupies a wide variety of well-drained soils. In the north it is succeeded by types in which sugar maple is predominant. Cutting of the oaks has increased the numbers of hickory.

SAF Type 21; white pine (Pinus strobus) occupies 61 acres or 27 percent of the forested fee lands. White pine occurs in nearly pure stands or is predominant in this area. On heavier soils in the Northeast, paper birch, gray birch, black cherry, northern red oak, white ash, sugar maple and hemlock are associated. This type occurs throughout the Northern Forest with outposts in the Boreal and Central Forest regions. It is abundant in central New England and northeastern New York at elevations from sea level to 2,500 feet. White pine is frequently the first to occupy agricultural land after abandonment and occurs on land of all soil types (this is true at Colebrook). The type is a long-lived, usually subclimax but approaching climax on sandy soils. White pine seldom succeeds itself except after special silvicultural treatment.

SAF Type 23; hemlock (Tsuga canadensis) occurs on 10 acres or 4 percent of the forested fee lands. Among the associated species are beech, sugar maple, yellow birch, red maple, black cherry, white ash, white pine, paper birch, black birch, northern red oak and white oak. The type occurs throughout most of the Northern Forest at elevations from sea level to 5,000 feet. The type is essentially climax but over long periods tends to give way to sugar maple. In the northeast, a hemlock-hardwood mixture is not uncommon.

Stocking

The Colebrook River Lake area consists of a variety of stand type and size classes. Generally most of the individual stands have only one or two size classes present. The predominant sizes appear in the pole (5.0-10.9 inches in diameter) and small sawtimber (11.0-13.9 inches) classes. Some of the better sites and those sites which are virtually inaccessible (particularly the very steep slope in Compartment IV A west of route 8) are occupied by larger sawtimber. Stands are now generally in the 60-year age class and approaching economic maturity.

Quality of Growing Stock

The overall quality of the growing stock is fair to good. Though climatic conditions for forest productivity are potentially favorable, site and soil conditions (exposure, thinness, rockiness, low natural fertility) and intense competition reduce growth potential. Crown cover varies from 60 to 100 percent on most forested sites.

Forest Inventory

A detailed inventory was conducted in December 1981 for each stand by compartment using Q10 BAF prism in a random inventory. Only trees over 10 inches diameter at breast height (DBH) were tallied. Data collected for each stand includes: cover type, board foot volume of growing stock, basal area per acre, and general comments on access, operability, understory and wildlife habitat. Management recommendations will be developed

in detail and forest stand type maps prepared (see Exhibit A, Map No. 1). Approximately 41 acres in Compartment IV A was not inventoried due to its inaccessibility.

Prescriptions

A record for each compartment will be maintained. This record will contain a large scale map of the compartment (1":500') showing any subcompartments; compartment and project boundaries; normal and flood pool elevations; and other major identifying features. Management work accomplished will be recorded by date and location for each compartment, i.e., plantings, TSI and inventory work, along with related photos, maps and tables.

Management recommendations will be updated on a five year cycle. Any prescriptions will include the compartment's location, an adequate description of the physical and biological resources of the area, vegetative cover type, soil conditions, uses of the area, and other pertinent considerations. Management needs for a five year program will then be listed, i.e., succession control mowing, fire roads, thinnings, tree and shrub plantings, boundary maintenance, and fuelwood cutting program.

Open Land

Open areas comprise 82.7 acres, or 21 percent of the reservoir fee lands and consist of old fields, old homesites and a wildlife refuge area. Presently, the only management of open areas is periodic mowing of selected old field areas to control natural succession. A major consideration in open area management will be maintaining or improving the existing ratio of open land to forest land.

Wildlife and Wildlife Habitat

Fluctuating water levels in the lower reaches of the reservoir limit wetland furbearer and waterfowl habitat. The ratio of forested area to open land is low (2.75: 1), but still provides an adequate edge to support a variety of upland game, predators and a variety of non-game birds and mammals.

Land use and man's influence in the past 200 years has changed the composition of the wildlife species found in the project area. Many species, including the black bear, timber wolf and mountain lion are no longer present or extremely rare in the area.

The chestnut blight virtually eliminated the American chestnut (*Castanea dentata*) which was once a major mast producer in the area. The decline of the chestnut, combined with market hunting, eliminated the wild turkey from the State of Connecticut. Mast production in older oak stands

is decreasing due to the loss of many trees from gypsy moth defoliation. Reintroduction efforts by the State of Connecticut have increased the wild turkey's range to include Colebrook River Lake.

The project lies along th migratory route of many waterfowl and hawks. Occasional sightings of adult and immature bald eagles have been recorded by project personnel.

Sufficient emergent vegetation for food and cover and a fairly stable water level in spring and summer in the wildlife refuge in Compartment I provide the most suitable waterfowl nesting and brooding sites. This site is frequently used by wood ducks (Aix sponsa), black ducks (Anas rubripes), mallard ducks (A. platyrhynchos platyrhynchos) and Canada geese (Branta canadensis). American mergansers (Mergus merganser americanus) are known to breed in the upper end of the reservoir where a flowing river habitat is found.

The wildlife of the project area are those well adapted to rural and remote environments. A partial list of typical area species to be considered in the selection of management practices may be found in Exhibit A, Table 4.

Neither Connecticut nor Massachusetts is actively involved in wildlife management at Colebrook River Lake. Both states are involved in the put-and-take stocking of mature ring-necked pheasants on State forest lands in the vicinity of the project and it is likely that some of these birds may wander onto the project lands.

A program of maintaining open area and planting perennial and annual food plants would increase both the number and variety of species present on the project.

Aquatic Resources

There are three types of aquatic habitats which may be distinguished at Colebrook River Lake:

(1) The West Branch of the Farmington River and brooks with flowing water that are found above the dam;

(2) ponds, marshes and other sites where there are small, shallow accumulations of standing water; and

(3) the impoundment or the 760 acre spring water supply pool of Colebrook River Lake.

The river and brook environments of the West Branch of the Farmington River cover approximately 1.7 miles within the project. The State of Connecticut has designated the West Branch of the Farmington a Class AA stream above Goodwin Dam. Class AA waters are existing or proposed

drinking water supply impoundments and tributary surface waters. These waters are suitable for drinking water supply; suitable for all other water uses; character uniformly excellent; subject to absolute restriction on the discharge of sewage or pollutants into them. In addition, existing and proposed drinking water sources and the lands from which they drain may be subject to restricted use by State regulations, local ordinance, or by the property owner.

The West Branch of the Farmington River above Colebrook Dam has excellent fish and wildlife habitat qualities and good aesthetic value. Both the river and the conservation pool are important cold water fisheries. Natural reproduction of the preferred sport fish, trout, does occur in the river habitat, but due to fluctuating pool levels, it is unlikely that reproduction occurs in the impoundment.

In the spring of 1969, 25,000 rainbow trout (Salmo gairdneri) and 90,000 sockeye salmon (Onchryncus nerka) fry were stocked in the Colebrook pool by the State of Connecticut. Connecticut, Massachusetts, and the U.S. Bureau of Sport Fisheries and Wildlife stocked approximately 53,400 rainbow trout and 300 brook trout (Salvelinus fontinalis) in 1973. Approximately 400,000 salmonids were stocked between 1969 and 1971.

Because of heavy fishing pressure, the natural population is supplemented by annual stocking of trout by Connecticut and Massachusetts. Connecticut stocked 1,500 brown trout and 1,850 rainbow trout in the impoundment prior to the opening of fishing season on April 17, 1981. An additional 700 brown trout and 800 rainbow trout were released in the lake during the season. Massachusetts does not stock fish within the project boundaries, but does stock the West Branch of the Farmington River upstream of the project. It is likely that some of these fish do migrate downstream to project waters.

Stable water levels in the wet marshy area of the wildlife refuge support a wetland furbearer population that is known to include upwards of six beavers (Castor canadensis) and muskrat (Ondatra zibethica).

Small standing water habitat includes the 8.3 acre pond in the wildlife refuge which is a warm water fishery. Management in this area should be aimed at improving the warm water habitat.

SECTION 4. FOREST MANAGEMENT

Existing Management

Forest management on lands owned by the State of Connecticut and the Hartford MDC is the responsibility of and accomplished by the respective agencies. The Corps reserves the right to remove any snags, dead or fallen timber and other debris on State or MDC property which may fall or float into the conservation pool. The Corps is responsible for forest management on the 388 acres of land owned in fee. Management efforts on these lands have been limited to selected removal of trees which may present a safety hazard or provide wood products for project use and the selective planting of coniferous seedlings and perennial shrubs including autumn olive, (*Eleagnus umbellata*) to provide winter cover and food for wildlife and slope stabilization.

Objectives of Forest Management

The objectives of management are to increase the health and value of forest lands for recreation, wildlife habitat, aesthetics and watershed management through application of sound silvicultural practices. The forest resource will also require protection from insects, diseases, fire and overuse.

Management Needs

During the life of this plan, problems related to reservoir resource management will occur. These problems might be:

a. Establishment and maintenance of desirable forest cover in areas used for recreation. There is a need for forest cover to serve as shade trees, erosion protection, and wildlife cover.

b. Selecting open areas which should be maintained and planting trees and shrubs beneficial to wildlife at the edges of open areas.

c. Promoting species diversity through planting and cutting practices.

d. Protecting steep banks from erosion.

e. Establishing and maintaining habitat for game and non-game wildlife.

f. Protecting heavy use areas from site deterioration.

g. Reestablishing vegetative cover on areas denuded by overuse and/or high water.

h. Protecting representative areas of natural cover types and large or unique trees for the enjoyment of present and future generations.

Forest Land Classifications

Forest covers about 59 percent of the reservoir fee lands. The remaining 41 percent, including parts of the 760 acre lake, is in open fields, old homesites, marshes, and old borrow areas. The forest timber has commercial value but is subject to close control of harvesting operations because it is located in a public water supply watershed. Some of the old fields are reverting to brush and will return to forest if left unmanaged.

Forest Compartments

The reservoir area is divided into four compartments to ease administration, preparation of prescriptions and record keeping. They have been designated according to present use, size, and ease of identification of natural and artificial boundaries in accordance with ER 1130-2-400. When preparing prescriptions, compartments may be further divided into subcompartments on the basis of vegetative cover, location, primary use, etc., when justified (see Exhibit B).

Compartment I (38.0 acres)	Reserve Forest Land (Wildlife Management)
Compartment II (15.6 acres)	Recreation-Intensive Use
Compartment III (179.0 acres)	Project Operations
Compartment IV (155.4 acres)	Reserve Forest Land (Wildlife Management)

Treatments

A variety of practices are needed to meet the management objectives stated above. The intensity and extent of practices applied will be justified by the primary land uses of each compartment.

Reserve Forest Land (Wildlife Management)

These areas comprise most of the fee lands in the reservoir and area allocated for vegetation control and improvement to support management objectives, primarily for wildlife habitat, low density recreation, and erosion control.

a. Regeneration Standards. Natural reproduction will serve as the major means of regeneration to perpetuate native species. Stands with a variety of species and age classes will be encouraged. Species adapted to the various growing site conditions will be favored in choosing silvicultural management practices.

Artificial regeneration, i.e., planting and seeding, will be used on a limited basis for specific purposes, such as erosion control, wildlife food and cover, and for promoting flood tolerant species.

The use of mechanical and/or chemical measures are justifiable on these lands for site preparation, to promote survival rates and vigor, to control competition or to slow competition in selected areas and to promote more species variety. The use of fertilizers, mulches and watering will not normally be justified on these lands.

b. Cultural and Tree Removal Standards. In established and new stands the following timber stand improvement (TSI) standards will apply:

Pruning is an expensive treatment and will be limited to individual trees or specific stands of high value for recreation and wildlife and to eliminate obvious safety hazards. Girdling of large trees may be justified in certain cases to release the understory.

Intermediate cuttings will be used on these lands and include thinnings, release cuttings, improvement cuttings, and salvage and sanitation cuttings. Regeneration cuttings of mature trees on a single tree or small group selection will be used to reproduce uneven-aged stands. Clearcuttings in small one-quarter to one acre blocks will be prescribed for habitat improvement. Slash that does not have to be removed should be lopped close to the ground to increase decomposition, chipped for mulch, or stacked in scattered small piles for wildlife cover. Large dead trees should be left where practical along water courses and in the impoundment zone where they provide needed anchorage on slopes and serve as den trees.

On reserve forest lands, cuttings will be prescribed for one or more of the following reasons:

1. To clear sites for developments, such as access roads, fire breaks, trails, and boundaries.

2. To control insect and disease infestation.

3. To improve wildlife habitat by varying basal area and composition.

4. To remove safety hazards and flood and fire killed trees.

5. To improve stand vigor with thinnings, release and regeneration cuttings.

6. To provide forest products for project and national defense purposes.

A number of factors will be considered in each stand before tree removal: erodibility of soils, location of water courses, management objectives for the compartment, health of the stand, species to be regenerated, aesthetics, and effect on residual stand.

c. Protection Standards. Measures required on reserved forest lands to preserve the resources are: control of unauthorized use, fire control, erosion control, insect and disease control, and regular reconnaissance inspection.

Control of unauthorized use includes active measures to prevent vehicular access (barricades, obliteration of unnecessary roads, and signing) and regulate and control agricultural and timber trespasses, boundary inspection and maintenance.

Compartment I contains a wildlife refuge where hunting and fishing are prohibited. The refuge is managed as a natural area where many species of wildlife may be observed. Much of the compartment has been planted with conifers and shrubs having high wildlife cover and food values.

Recreation Intensive Use Lands

These lands (Compartment II) are reserved for administration use and intensive recreational development and activities. The boat launching area receives heavy recreational use and is the only developed recreational facility at Colebrook River Lake.

In a developed recreation facility such as the boat ramp and in future developed areas intensive grounds maintenance and arboricultural practices may be required to protect soil and vegetative cover, improve aesthetics, provide a pleasing outdoor recreational setting and where practical, improve wildlife habitat. These practices may include:

a. Regeneration Standards. Use of sapling size tree planting stock, along with shrubs, is justified on these lands for individual and small plantings. Species adapted to various site conditions and intensive recreation use should be considered for needs such as screening, erosion control, shade, growth rate and durability.

Mixed seedlings may be planted for habitat improvement, erosion control and to provide edge effects for wildlife. Open areas should be planted with shrubs, grasses, and trees with high wildlife food value.

Use of disking, mowing, clearing, stump treatments, and minimum herbicide applications are treatments justified on these lands for site preparation and to control competition.

b. Cultural and Tree Removal Standards. Lawn areas may require periodic fertilization and aeration. Annual inspection by management personnel will be performed to determine treatment needs.

Pruning of trees should be a regular practice where needed for access, visibility, safety, appearance and maintenance of vigor. Pruning will not be used for the purpose of improving timber quality.

Mechanical methods for control of woody or herbaceous growth will be favored over chemical methods. Chemical spraying should be used only for reasons of public protection, such as the control of poison ivy, or where other means are not practical. Application should be on a selective basis using spot treatments. Selective cutting will be used to accomplish one or more of the following purposes:

1. To clear sites for developments; such as roads, trails, and new picnic sites.

2. To create vistas and improve aesthetics.

3. To control insect and disease infestations.

4. To meet requirements for access, safety, aesthetics, utilities, etc.

5. To remove dead, damaged or less adaptive trees while favoring or planting appropriate species.

Cutting in recreation areas should be kept to a minimum for specific reasons. Tree removal should be done primarily in the fall through early spring period. For aesthetic and safety reasons, stumps should be left at ground level or removed. Wood produced should be sold to the public or utilized by the Corps according to policy. Slash should be quickly disposed of or chipped and used as mulch.

c. Protection Standards. Recreation lands (existing or future developments) must be protected from adverse impacts through sound management.

Control of vehicle and pedestrian access is the key to the protection of the resource both in areas developed specifically for recreation and in those areas where recreation activity such as fishing or picnicking have an impact. Natural barriers should be favored, such as tree and shrub plantings or readily available large boulders arranged to exclude traffic

or direct it away from fragile or damaged sites. Manmade devices such as signs, gates, and barriers should be kept to a minimum and made to blend into their surroundings. Regular patrol and inspection is very important to limit undesirable access and use.

The boat launching area was not landscaped during construction. The parking area and boat ramp provide little aesthetic appeal to visitors. A limited landscaping program will be undertaken to provide shade trees, lawn area, and a more pleasing aesthetic appearance to the area.

Intensive grounds and tree maintenance practices are justified in this area. Common measures include thinnings to increase sunlight, fertilization, soil aeration, and mulching.

Areas such as the access to old Route 8 at the north end of the boat launching area which show signs of erosion and site deterioration will receive prompt maintenance attention. Control of access, reseeding and mulching will be adequate for protection. The access to old Route 8 should have a simple gate structure installed to control access and the slope leading from the parking area to the road should be graded and paved with rolled rushed stone or bituminous concrete.

Landscape plantings and other vegetation cover will be maintained in a vigorous and fast growing condition to improve aesthetics and prevent infestation. Regular inspections are required to detect problems.

Project Operations

These lands (Compartment III) comprise the major flood control features of the project - the dam, spillway, dike access road, utility building and project manager's quarters. Management measures will encompass aesthetics, control of insects, diseases, fire and erosion problems.

Compartment III contains some forested land. These areas will be managed as reserve forest/wildlife management areas and will be subject to Reserve Forest Land Standards. A small picnic site located in this area will be subject to the same standards and management practices appropriate for Recreation-Intensive Use lands.

a. Regeneration Standards.

Approximately 15 percent of this area is open land. The lawn areas adjacent to the dam, access road and dike are mowed regularly by project personnel. Planting of mixed conifers and perennial shrubs beneficial to wildlife has occurred on the east and west slopes of the access road.

Artificial regeneration using transplants of trees and shrubs will be used on a selective basis for specific purposes such as landscaping, buffer strips, and erosion control.

Application of mechanical and/or chemical measures are justified on these lands only to control competition and remove undesirable vegetative growth from riprap slopes and roadsides. Fertilizers, mulches and watering may be used on landscape plantings.

b. Cultural and Tree Removal Standards.

Pruning of trees will be limited to the elimination of obvious safety hazards. However, landscape plantings should be pruned periodically to improve appearance and maintain vigor.

Tree removal will improve aesthetics, remove debris and hazard, and control infestations.

c. Protection Standards.

Access to these lands by the public is limited. Prompt action will be taken to control erosion and slumping. General protection against fires and infestations will be regular removal of accumulations of severely damaged, diseased and dead trees and slash. Access is fair for fire suppression and harvest operation requirements.

Fire Control

Open fires are prohibited at Colebrook River Lake. A separate Fire Protection Plan, Appendix C, was prepared in 1975. It provides general information of fire protection requirements and measures for project lands.

Measures to increase fire protection will be regular cuttings and cleanings of damaged trees and slash to reduce the accumulations of fuels, and frequent patrols during peak fire seasons.

Pesticides

To date, there has not been a need for an application program for control of insects or other vectors. However, chemical or biological controls may be prescribed for specific occasional purposes for protection of public health and to protect valuable shade trees and grounds.

Herbicide applications have been used in a regular program to control undesirable grass, weed and brush growth primarily on the rock slopes of the dam and spillway. Ammate, 2, 4-D, and simazine have been applied in recent years. Some, such as silvex which contains, 2, 4, 5-T and dioxin, have been suspended by the EPA and are no longer in use.

Registered chemicals that are safe for use around water areas and aquatic life will be specified and contract applications closely monitored. The pesticide program is reported annually in accordance with

ER 1130-2-413. Alternative methods to chemical controls of vegetative growth, forest infestations, and other pests will be considered and implemented when proven to be effective and practical.

Insect and Disease Control

Forest cover at Colebrook River Lake is primarily the oak-hickory central hardwood type with an increasing tendency to northern mixed hardwoods. Insects and diseases have, generally, not been an important problem.

More important insects and diseases having a current or potential impact on the major tree species in the region are:

Insects

a. Gypsy moth (*Porthetria dispar*). Preferred species are oak, apple, aspen, birch, linden, and willow. Mortality from repeated defoliations has been significant. Continued defoliation causes reduced growth and vigor of surviving trees leading to increased susceptibility to insect and fungi attacks and fire damage. The population buildup in 1981 is considered to be the worst ever in New England with a projection of 3 million acres to be defoliated.

b. White pine weevil (*Pissodes strobi*). In descending order of preference, its most commonly attacked hosts are: eastern white pine (most serious), Norway spruce, jack pine, Scotch pine, pitch pine, red pine, and certain other native and introduced conifers. Attacks are through the previous year's terminal shoots.

c. Hemlock looper (*Lambdina fiscellaria fiscellaria.*) The looper may defoliate hemlock and sometimes cause local or sporadic mortality. Outbreaks may occur very suddenly; the most serious ones in mature and overmature hemlock and balsam fir stands.

d. Japanese beetle (*Popilla japonica*). The beetle is an introduced pest and feeds on foliage of a wide variety of plants. Many species of forest and shade trees may be defoliated, particularly Japanese and Norway maples, horsechestnut, sycamore, gray birch, walnut, lombardy poplar, basswood, mountain ash, and elm.

e. Forest tent caterpillar (*Malacosoma americanum*). Favored hosts are sugar maples and aspens, along with apple and cherry. Young larvae feed on expanding buds; older ones devour foliage, often defoliating the host tree. Mortality after heavy defoliation is not usually severe but can result in reduced increment growth and quality of products derived from the tree.

f. Fall cankerworm (Alsophila pometaria). Preferred hosts are elm and apple, with other hardwoods, such as hickory, ash, maple, beech, basswood, cherry and the oaks, being secondary choices. Young larvae skeletonize young leaves at the tips; older ones eat all but the midribs or larger veins of leaves. The cankerworm is an important pest of forest and shade trees with outbreaks occurring periodically, sometimes infesting large forested areas.

g. Saddled prominent (Heterocampa guttivitta). Beech, birch, and sugar maple are its preferred hosts, but during major infestations it will feed on other hardwoods, particularly oaks and poplar. Young larvae skeletonize the upper surface of leaves; older ones eat the entire leaf except principle veins. Considerable mortality has occurred in areas receiving two consecutive years of defoliation. This pest is reoccurring in the Colebrook area and should be watched for.

Diseases

a. Anthracnose (Gnomonia spp., Gloesporium, spp., and others). On hardwoods, various causal fungi produce a variety of leaf spots which appear as dead areas on leaf surfaces. The fungi infect the host's leaves in the spring and may become severe after wet springs with occasional complete defoliation. It is generally not of concern in forests but control may be desirable on individually valuable shade trees.

b. Oak wilt (Ceratocystis fagacearum). This fungus affects all species of oaks, particularly red oaks, and continues to be a problem in the region. It can spread through grafted root systems of trees and is transmitted by spores. Symptoms spread rapidly with dieback starting at the top of the crown and moving downward.

c. Root rot (Fomes annosus). This disease is common to most conifers, especially pines, particularly after thinning. Infected trees are likely to have a thin unhealthy crown; others die too quickly to shown noticeable symptoms. Site and environmental conditions are critical in development and degree of impact of disease. Bark beetles often attack fungus-weakened trees. This important disease is on the increase in the area.

d. Nectria canker (Nectria spp.). One or more species of Nectria attack many species of hardwoods, particularly trembling and bigtooth aspen, white, yellow and black birches, basswood, black walnut, American elm, red and sugar maples, and red and white oaks. Cankers develop on the main stem thus reducing the value and productivity of the individual and subjecting trees to wind breakage. They also serve as openings for entrance of wood-rotting fungi.

Control. Basic measures to control infestations in the reservoir will be to maintain tree species vigor and diversity. On forest lands, silvicultural practices will include, removal of damaged, overmature and

severely infested trees; TSI measures such as pruning, thinnings and harvests; protection for fire; selective cutting of and reforestation with tree species better suited to site conditions; and balanced spacing of trees within the stand to improve growth rate, sunlight penetration and aeration.

More expensive chemical and mechanical control measures are justified on individual shade trees in recreation and administration areas. These include: pruning, crown and stump spraying, wound treatment, injections, slash removal, and soil aeration.

Boundary Maintenance

Colebrook River Lake was surveyed during construction, but only a few monuments were set in place. The project will be surveyed and monumented under contract in fiscal 1982. A regular boundary marking and maintenance program is an important part of resource management and protection.

Visual inspection of all boundaries should be made at least every two years, more often in areas where possible encroachment/problems may occur. Lines will be marked when and where necessary with standard signs (#M-3), red and white paint and vegetative plantings where necessary.

An original record with maps will be maintained at the basin office showing marking and maintenance completed and listing monuments which have been damaged or are missing. Schedules can then be made for continuing maintenance and contracting of services to reset monuments as needed.

Timber Sales

The Corps controls the sale of wood products on the project fee lands. Small sales of fuelwood timber are an effective way to accomplish TSI, sanitation and general clearing work.

Harvest plans for large scale timber sale proposals will include: a location map; area and stand descriptions; objectives; volume estimates; wildlife and environmental considerations; and fire control and safety. All trees to be harvested will be marked at the stump and "eye high" prior to sale.

All timber harvesting will be coordinated with the Hartford MDC.

Public Fuelwood Program

The Corps administers a public fuelwood program to help satisfy the demand for wood as an energy source while accomplishing resource management objectives. Fuelwood permits are available at a nominal charge. The needs of the resource are to be given priority over the demand for fuelwood.

SECTION 5. AQUATIC MANAGEMENT

Existing Management

Fisheries management is the responsibility of the Connecticut Department of Environmental Protection and the Massachusetts Division of Fisheries and Wildlife. Colebrook River Lake and the West Branch of the Farmington River support coldwater fisheries. The small pond in the wildlife refuge supports a warm water fishery. Trout are stocked in both the lake and the river on a put-and-take basis. Fish are stocked in the spring and at midseason in numbers which vary slightly each year according to availability from the hatcheries.

There has been limited sampling of the fish population in Colebrook River Lake by the State of Connecticut in 1969. A list of species likely to inhabit the lake, river and brooks is found in Exhibit A, Table 4.

Factors Influencing Aquatic Management

The principal factors influencing aquatic management are the nature of the habitat and fishing pressure. The aquatic habitats at Colebrook River Lake are excellent. Present fishing pressure is adequately accommodated by the stocking programs.

Water Quality

The overall quality of the waters of the project is excellent. The waters have been designated as Class I (High water quality) by the New England Division's Water Quality Laboratory.

The NED Water Quality Lab will continue low-level fixed station monitoring at Colebrook River Lake.

Water Level Fluctuation

Reservoir regulation for flood control, water supply and fish conservation will continue to periodically alter lake levels. This environmental change may be significant to aquatic life in the impoundment but does not usually affect the river habitat. Rapid changes in pool elevation during early or midspring could coincide with spawning activities of some warm water species. Spawn or nests exposed through receding water levels would be destroyed, thereby having a direct impact on fish productivity.

Reservoir Regulation

The authorization for Colebrook River Lake provides for storage for flood control, water supply and fish conservation purposes.

The storage capacity in the reservoir totals 97,700 acre-feet and is proportioned as follows:

Purpose	Storage (acre-feet)	Elevation (ft. msl)
Flood Control (Includes 5,000 acre-feet for shad fishery)	50,200	708.0-761.0
Fish Conservation	5,000	701.2-708.0
Water Supply	30,700	643.7-701.2
New	30,700	643.7-701.2
Replacement	1,000	641.0-643.7
Existing	9,800	596.3-631.0
Sedimentation and Dead Storage	1,000	567.0-596.3
Total	97,700	

The fish conservation storage totaling 10,000 acre-feet is provided as follows:

(1) Up to 5,000 acre-feet is made available for establishing and maintaining a spring shad fishery by temporarily infringing upon flood control storage between the end of spring snowmelt and June 30.

(2) The Hartford Metropolitan District Commission has agreed to maintain in its water supply pool a 5,000 acre-foot hold-over pool for mitigation of downstream fishery losses. This will be accomplished in the future when the Commission diverts water into the Barkhamsted Reservoir. This pool is provided for in the water supply contract between the Federal Government and the Metropolitan District Commission. Exhibit B, Plate No. 1 contains a graphic illustration of water storage allocation.

Habitat Improvement and Maintenance

A creel census should be undertaken to determine specific angler utilization and interest in the fishery. A cooperative General Limnological Survey between the Corps and the States of Connecticut and Massachusetts should be conducted.

The goal will be to assess the productivity and stream morphology in the waters of Colebrook River Lake. The information obtained will assist in determining the adequacy of current management efforts, identify habitats, obtain harvest data on aquatic species present and monitor fishing pressure.

Anadromous Fish

When the Colebrook River Lake project was authorized, provisions were made for allocation of water storage to support downstream fisheries.

The Farmington River is an important sport fishery, supporting populations of brook, brown and rainbow trout. In recent years, efforts of the Federal and State governments and private organizations have restored runs of Anadromous fish (spending much of their lives in salt water and attaining most of their growth there, but ascending fresh water streams to spawn), such as: American shad (*Alosa sapidissima*); Atlantic salmon (*Salmo solar*) and sea-run brown trout, to several New England rivers, including the Farmington.

The success of the restoration program in the Farmington is largely dependent upon controlled releases from Colebrook and Goodwin Dams which augment normal stream flow and water levels. Any future management programs or uses of Colebrook River Lake must give major consideration to maintaining the downstream fishery and the success of the anadromous fish restoration program.

Eventually, anadromous fish will be able to run upstream to Goodwin Dam if additional fish passage devices are installed at Winchell Smith and Collinsville Dams.

The Farmington River Watershed Association

The Farmington River Watershed Association is a private, non-profit organization which is concerned with the management of the Farmington River watershed. Since 1953, the organization has been actively involved in improving the water quality and aquatic environment of the Farmington, and more recently, in restoration of anadromous fish runs, particularly Atlantic salmon, to the river.

The Association was instrumental in completion of a fish passage device at Rainbow Dam as part of the salmon restoration program and is dedicated to: maintaining a fine river with quality water and guaranteed flows for everyone's enjoyment; improved land use, reduced erosion, protecting flood plains and managing the water resource.

SECTION 6. WILDLIFE MANAGEMENT

Existing Management

Wildlife management is primarly the responsibility of the State's. As stated previously, neither state is involved in stocking programs on project lands.

The Corps' wildlife management efforts are primarily in the area of habitat improvement and maintenance and will continue to be so in the future.

Habitat improvement work accomplished by the Corps to date includes:

7,000 White pine (*Pinus strobus*) seedlings planted in Compartment III between 1971 and 1976.

2,500 Autumn olive (*Eleagnus umbellata*) seedlings planted in Compartments I and III between 1971 and 1979.

100 High Bush cranberry (*Viburnum trilobum*) seedlings planted in 1979.

Future wildlife management efforts by the Corps will be coordinated with the States of Connecticut and Massachusetts.

General

The objective of the Corps wildlife management program will be to provide for the greatest diversity of species indigenous to the surrounding area and compatible with the operation of a flood control project. One management objective will be to develop a wildlife resource contributing the greatest good to the most people over the longest time. Nonconsumptive uses of wildlife, such as sightseeing and photography, will receive equal consideration with consumptive uses, such as hunting and fishing. Vegetative and water level manipulation should be the principal methods of fish and wildlife habitat enhancement, and should be consistent with other joint uses and basic physical limitations at Colebrook River Lake.

An increase in vegetative diversity and dispersion by age class, species, height and density will provide cover, food and edge in all project compartments and thus help increase wildlife diversity. Water edges will be allowed to grow thick tangles of water and ice-resistant shrubs and trees for shade and cover except in the developed recreation areas.

TSI will be conducted to release and favor trees which produce food for wildlife or provide cover or nesting cavities, and to promote the health, vigor and aesthetics of the forest itself. Examples of forest

manipulation for wildlife management will be selective thinnings to produce uneven-aged stands, release cuttings of coniferous species, preservation of den trees, thinning of trees with little wildlife value in favor of other species, and small (1/2 to 1 acre) clearcutting to create productive open land.

Wildlife Habitat Lands Management Practices

Since its completion in 1969, Colebrook River Lake has been managed by the Corps as a natural area set aside primarily for wildlife habitat. Fishing and boating are the most popular recreational uses of the project. The developed recreation areas of the project include the boat launching area and the dam access road and overlooks. It is important to preserve and enhance the natural habitat of the project.

Seven general land management practices may be used to develop or maintain wildlife habitat. Soil type, topography, elevation, size of area, access and land use will determine which practice or combination of practices will be used.

Land units have been divided into management compartments and will be further broken down into subcompartments with management prescriptions made for each. Compartment prescriptions will be updated completely every five years. Working papers for all management work will be maintained. Annual work plans should be completed for each calendar year. Seed varieties and mixtures, and planting methods and dates will conform to recommendations provided by the DEP, Connecticut Agricultural Extension Service or the U.S. Soil Conservation Service.

Once a prescription has been made for field areas, land management practices will be performed on at least one-third of the open field acreage each year. Consequently, once every three years, all open land parcels will have been treated. Fields should be topdressed with manure or fertilizer once every three years to ensure optimum growth. Maintaining existing open field acreage through various succession control methods and cultural practices is a primary objective in this wildlife program. The establishment of new field areas and access to them is also important. A comprehensive turf maintenance management schedule should be developed for intensively used recreational open areas with wildlife management practices restricted to edge plantings.

Prescriptions will list the recommended land management practices for the compartments and their areas. The seven land management practices follow:

Practice #1. Developed recreation area use. Wildlife habitat enhancement on these sites will be designed to draw wildlife closer to developed recreation areas for sightseeing and aesthetics without interfering with the area's recreational potential. Plantings of perennials

beneficial to wildlife for food or cover will serve as border strips on these sites. Intensively used lawn areas should undergo a regular turf maintenance management schedule including lime, fertilizer and weed killer application to be clearly distinguished from succession control open areas.

Practice #2. Timber Stand Improvement. Standard forest management practices will usually have wildlife benefits while achieving increased stand vigor and desirable composition. The following will have specific benefits for wildlife:

a. Release cutting to open canopy space for desirable food and cover species. Conifers such as white pine, *Pinus strobus*, eastern hemlock, *Tsuga canadensis*, and eastern red cedar, *Juniperus virginiana*, would benefit from release on the project where possible.

b. Selective cutting to decrease the basal area of a stand and to allow more growth on the forest floor will increase stand vigor. Stump sprouting will be encouraged in this manner. Desirable mast trees can be selected and maintained.

c. Removal of den or some wolf trees with unsound limbs or trunks will not be implemented unless visitor safety is a factor, as in developed recreation areas or along access roads or trails.

d. Access to remote areas will be improved for use by the public, fire suppression equipment, forestry operations, and habitat improvement equipment.

Practice #3. Open Area Maintenance. Open areas will be mowed at least once every three years to keep shrubby species from invading. Mowing half of each scheduled field once in early summer (1 July), and the other half in late summer (15 September) will be done to maintain succulent vegetation and provide food and cover in the fall.

Open area edges can be maintained by thinning. A 25-foot wide perimeter of tall grass will surround designated mowed areas to provide undisturbed nesting and escape cover and will be mowed once every three years. A 15-foot wide perimeter surrounding the tall grass will be thinned of everything greater than two inches diameter breast height (DBH) with brush piled well within forest edge. A 10-foot wide strip surrounding the 15-foot perimeter will be thinned of trees over 4 inches DBH, piling slash well within forest edge.

Practice #4. Natural Succession Areas. These areas will be set aside from management activities. Natural succession will be allowed to proceed undisturbed by any form of vegetative manipulation by man.

Practice #5. Artificial Nest Structures. Use of artificial nest boxes will be made when natural cavities are unavailable or in short supply. Wood duck boxes should be installed in appropriate locations. Destruction of natural nest cavities in reservoir clearing or timber harvest operations will be compensated for with artificial nest boxes.

Practice #6. Fish Management. Cold water fishery habitat improvements, through streambank and streambed measures and protective shade vegetation will be implemented along running streams. Attempts to control rough fish through fishing derbies is encouraged. Records of cross sectional water temperature, depth and dissolved oxygen will be obtained from Water Quality Lab and maintained in annual working papers.

Practice #7. Perennial Food and Cover Plantings. These plantings are less expensive to put in and maintain than annual food plots but are also productive. Hemlock, *Tsuga canadensis*, is recommended for understory plantings in 10 x 10 spacing in plots 100 x 300 feet to provide winter cover and seed. Borders or rows will be planted with autumn olive (*E. umbellata*), white pine (*Pinus strobus*), highbush cranberry (*Viburnum trilobum*), black walnut (*Juglans nigra*) or other perennials available for sale through the Connecticut State Forest Nursery in Voluntown. Plantings will be made in rows or small clumps in such a manner to provide a maximum edge effect, taking specific site and plant species limitations into account.

As many as four wood duck nesting boxes will be installed in the wildlife refuge in Compartment I during the winter of 1981-1982.

Other wildlife management work to be accomplished during the first year of this plan will include: planting of shrubs for food and cover in Compartment IVB and pruning autumn olive shrubs in Compartments I and II on the access road slopes. This pruning will be done to remove dead material, increase vigor and encourage stump sprouting.

SECTION 7. ENDANGERED SPECIES

No Federally recognized endangered mammalian, reptilian, amphibian, aquatic or avian species is known to presently inhabit the Colebrook River Lake area.

Sightings of osprey (*Pandion haliaetus*), a Connecticut endangered bird are made occasionally in the reservoir, but the birds appear to be transient. No sightings of breeding pairs have been recorded in the immediate area. Adult and immature bald eagles (*Haliaeetus leucocephalus*) have been observed by project personnel during summer months. The great blue heron (*Ardea herodias*), designated a Connecticut rare bird is a frequent visitor in the warmer months, but no evidence of breeding has been found.

Because of the remoteness of the project, rare Connecticut species such as the bobcat (*Lynx rufus*) and timber rattlesnake (*Crotalus horridus horridus*) are likely to be present in the area.

Sightings of endangered species will be reported to Connecticut and/or Massachusetts wildlife units. Measures will be taken to create public awareness of endangered species through the posting of informative material about the animal or other interpretive activities following a sighting. Information programs will not in any way endanger the animals.

Ranger personnel from the Naugatuck River Basin will continue to participate in the midwinter Bald Eagle Survey, sponsored by the National Wildlife Federation, which was initiated in January, 1979.

SECTION 8. ECOLOGICAL RELATIONSHIPS AND IMPACTS

General

The implementation of this resource management plan will, by necessity, alter some forest stands and habitat in the reservoir. The manipulation of the project ecosystem will be accomplished in such a manner as to consider the environment as a whole, to minimize any adverse effects and to maximize the beneficial ones.

An environmental assessment of the operation and maintenance of Colebrook River Lake was prepared in June, 1974. The assessment did not identify any existing or potential problems affecting the resources and public use of the reservoir.

Soil Erosion

There are no significant erosion problems on the project. The use of trail bikes has caused some minor damage in various locations in Compartment II and IV B. Some soils in the reservoir are very susceptible to erosion and care must be excercised to protect them adequately. No silvicultural or management practice which may cause erosion problems will be used on the project. The suitability and limitations of soil types will be assessed.

Effects of Indundation of Forest Stands and Habitat

Reservoir operations will not affect wildlife habitat in the areas below 718 feet N.G.V.D., which is the level to which the reservoir has been cleared, approximately 840 acres. Clearing operations eliminated habitat for many species in the immediate shoreline area of the project.

The adverse effects of flood impoundments on forest species and woodland habitats have not been a significant problem in the reservoir. Impoundments may occur several times a year, at any time. Areas generally inundated are those areas which have been cleared and occasionally the open fields adjacent to the river in the upper end of the reservoir. The pool of record, elevation 739.8 N.V.G.D. was reached in July, 1972.

Mortality of trees has been undramatic due to reservoir clearing operations. Trees in the flood plain at the reservoir's upper end have only been flooded four times since construction of the project. Older, larger trees will be among the first to show signs of distress including loss of vigor due to inundation. Duration of impoundments (usually from one to four days) is one of the major factors contributing to tree mortality.

Mortality rates are worse when impoundments occur during the growing season. Those occuring in fall through early spring are not generally harmful if mechanical damage - ice, wind, frost heaving etc. - does not result. The primary cause of mortality is damage to root structures and siltation on the canopy which inhibits plant transpiration and photosynthesis.

As a result of mortality from frequent flooding, (if it were to occur) the cover type adjacent to the main flood pool zone in the reservoir's upper end would tend to change over time from natural forest to open lands, or in some cases, to more flood tolerant species.

Public Use

Colebrook River Lake provides a valuable recreational and open space resource.

In this plan, Compartment II has been designated as a recreation-intensive use area. Most recreational use at Colebrook consists of fishing, boating, sightseeing, and limited hunting. The annual visitation for all recreational activities was 135,327 people in 1980.

Public use of the project is within the optimum carrying capacity. Use of the project, particularly its waters, are limited by the standby public water supply designation. No formal recreational areas such as picnic sites, comfort stations, campgrounds, and trail systems have been developed due to restrictions included in the project public use plan. Water contact recreation, including swimming and waterskiing, are prohibited.

The resources at Colebrook River Lake must be managed on a sustained basis to insure optimum use and check deterioration of the resource base.

Hydropower Studies

Colebrook River Lake is one of several Corps projects currently under investigation for the inclusion of hydropower as an added project purpose. A preliminary feasibility report assessing the economic viability of various hydropower alternatives was prepared under the authority of Section 216, Public Law 91-611. The preliminary report was completed by this office in February 1981. Report recommendations led to the initiation of a detailed feasibility report currently being prepared under the specific authority contained in the Resolution of the Committee on Public Works of the United Stated Senate, adopted 11 May 1982.

The detailed feasibility report preparation was initiated following approval by OCE in the fall of 1981 but recently it was partially terminated due to direct involvement in hydropower development by the Hartford Metropolitan District Commission (MDC). In November 1981 FERC granted the MDC an exemption for hydropower at their Goodwin project, and subsequent-

ly, a preliminary permit was also issued on 2 April 1982 to the MDC to study hydropower at Colebrook.

In April 1982 the MDC informally requested our technical assistance under Title III of the Intergovernmental Cooperation Act of 1968 for fast-tracking the hydropower potential of Colebrook up to and including the Plans and Specifications phases. Upon receipt of a Letter of Intent from the MDC, scope and extent of work together with reimbursable costs involved will be worked out and negotiated as a prelude to the conveyance of a MOU between the Corps and the MDC. Such a procedure will not only accelerate project implementation of Colebrook but offer an opportunity to interface it with hydropower development at Goodwin. It is good basin management practice, ideally efficient in use of water resources, in the best interests of all parties involved and avoids duplication of efforts in development and would result in savings in Federal funds, which is in conformance with the mandate expoused by the current administration.

SECTION 9. HUNTING, TRAPPING, AND FISHING ACCESS AND CONTROL

Law Enforcement

Hunting of upland game and waterfowl is permitted on Corps lands with shotgun only, subject to State and Federal regulations. Hartford Metropolitan District Commission lands are open to hunting by permit only (See Exhibit B). Fishing is allowed on project waters subject to State regulations. Possession of a valid Massachusetts or Connecticut fishing license entitles persons from either State to fish the water from Colebrook Dam north to the old Route 8 bridge in Sandisfield, Massachusetts. A Massachusetts fishing license is required north of the bridge. Trapping is not permitted on the project.

Hunting, fishing, and trapping are prohibited in the wildlife refuge (Compartment I).

The enforcement of fish and wildlife laws is accomplished primarily by the Conservation Officers of the Connecticut Department of Environmental Protection and the Massachusetts Division of Fisheries and Wildlife. The reservoir is also patrolled by the Hartford M.D.C. police force.

Access

Access to the project is provided at a number of locations. Hunters and fishermen may enter on foot from lands surrounding the reservoir. Vehicle access is provided by the dam access road, the boat launching area and by old Route 8 in the upper end of the reservoir. Access to the dam and boat launching area is controlled by gates. Access to the upper end of the reservoir is uncontrolled. Formal parking areas are provided at the dam and boat launching area and parking is unrestricted along old Route 8 in the reservoir. There is also a rest and overlook area adjacent to the project on relocated Route 8.

SECTION 10. INTERPRETIVE PROGRAM

General

The interpretation of management goals, responsibilities, resources, and limitations should be an essential part of natural resource management. There is currently no scheduled interpretive program at Colebrook River Lake.

Active Interpretive Programs

An active program including nature walks, dam tours, and other onsite presentations can be established, on a request basis, if visitation, availability of personnel and funding warrant it. In the past there has not been a great demand for this type of program at Colebrook River Lake.

The project manager conducts dam tours and brief talks on local flora and fauna on an impromptu basis, as do members of the recreation and resource management staff.

Wildlife and Forest Management

Land management near developed recreation areas will sometimes draw criticism through the public's misunderstanding of forestry operations or fish and wildlife habitat improvement techniques. Areas should be set aside near developed recreation lands which will show the effects of proper management techniques.

Research Cooperation

Cooperation will continue to be extended to the University of Connecticut Department of Natural Resources Conservation and other educational institutions in making Corps reservoir lands available to students for use as an outdoor classroom for independent studies and other course projects. These research projects will lead to better management of project resources.

Passive Interpretive Programs

Display boards have been placed at appropriate locations such as the project administration building and the boat launching area. They are used for project maps, regulations, and other appropriate materials provided by the Corps, State, and M.D.C.

SECTION 11. SHORT AND LONG RANGE MANAGEMENT PROGRAMS

Short and long range management programs on fee lands are the responsibility of the Corps. Management programs will be coordinated with appropriate agencies.

Short Range

Specific programs need to be scheduled in the first five year management plan. After this period, they will be continued as less intensive programs over the years.

a. Boundary Marking and Maintenance. A short range program to permanently mark the project boundary is being undertaken. New monuments will be set, and lines of site cleared and signs installed under contract in Fiscal year 1982. This will be followed by blazing and painting lines of sight by Corps personnel. Periodic inspections and maintenance will be accomplished as required (minimum interval of every two years). Funds will be budgeted as required for service contracts for major line clearing, brush control, and reestablishing lost or damaged monuments. A record will be kept in the Naugatuck River Basin area office on inspections and maintenance completed.

Long Range

These are ongoing programs to meet management goals. They will be accomplished through a variety of management approaches and practices: fish and wildlife habitat improvement, silvicultural treatments, public recreation, and improvement of aesthetics.

SECTION 12. PROJECT RESOURCE MANAGEMENT ORGANIZATION AND RESPONSIBILITY

The Corps is responsible for resource management on all fee lands.

The Park Ranger, under the general supervision of the Basin Manager and in close coordination with the Project Manager, will be responsible for the following resource management tasks:

a. Data collection, such as timber inventory and wildlife surveys.

b. Preparation and periodic updating of prescriptions for management compartments.

c. Preparation of annual work plans for vegetation and wildlife management.

d. Scheduling and supervision of management work to be accomplished.

e. Preparation and supervision of contracts dealing with resource management.

f. Inclusion of requests for needed funds in project budget submittals.

g. Maintenance of records and maps for work accomplished and costs.

h. Updating of the plan on a five year cycle in coordination with appropriate division elements and other agencies.

SECTION 13. ANNUAL WORK PLANS AND THEIR IMPLEMENTATION

The Park Ranger, in coordination with the Basin Manager and Project Manager, each January will prepare a plan and schedule for management work to be undertaken during the coming year. The plan for the previous year will be updated at the same time to show a record of actual work completed.

The annual work plans will include detailed information on materials and equipment needed, estimates of manhours and costs, dates for starting and completing work, maps and drawings needed, etc. The work plans will be reviewed and approved by the Basin Manager. Upon approval, action should be started on ordering materials and making advance preparations and coordinations.

Plans have been developed for a five year period and will be updated annually after assessing current conditions, availability of funds, and management needs. The first five year work plan is included in Exhibit A.

SECTION 14. PERSONNEL AND FUNDING REQUIREMENTS TO IMPLEMENT THE PLAN

The Park Ranger will divide work time between recreation and resource management responsibilities and other assigned duties here and at other Naugatuck River Basin reservoirs. Below is a current estimate of average annual field costs for hired labor and contracts for materials and services distributed over the five year cycle. Funds required for natural resource management work will be given equal consideration with other items in the project O&M budget.

Personnel

Position	Average - Annual Duties	Man Hour/Costs
Park Ranger, (GS-07)	1. Planning, coordination, records management, contracts	80 MH
	2. Data collection	40
	3. Field work (inspection, patrol, supervision, marking, planting)	80
	4. Training	24
	TOTAL	224 ($1,400)

Position	Duties	Costs
Forestry/ Biological Aide (GS-04)	1. Data collection	40
	2. Field work (inspection, marking, planting, TSI)	80
	3. Other field and office duties as assigned	40
	TOTAL	160 ($720)

Materials and Services

Supplies (drafting, paint, marking gun, signs, etc.)	$ 300
Materials (plants, fertilizer, mulch, etc.)	400
Equipment rental (dozer, roto-tiller, etc.)	1,000
Contract services (boundary, monument maintenance)	500
TOTAL	$2,200

A boundary survey contract will be performed during the first year of the five year cycle at a cost of $40,000.00.

Implementation

The implementation of this plan will initially require the personnel and funding requirements listed below:

Forest Management (Wildlife Habitat Improvement)

Plant shrubs with good wildlife food value on borders of open areas in Compartments I, II, IVA, and IVB.

1 GS-07 Park Ranger for one week	=	$316.00
1 GS-04 Forest Park Technician for one week	=	$220.00
Plant materials, fertilizer, mulch and 1/4 x 2 pickup truck @ $30.00/day	=	$220.00
TOTAL		$756.00

Prune autumn olive shrubs in Compartment I and III to increase vigor; remove dead and diseased limbs and improve aesthetics.

1 WS-06 Project Manager for one week	=	$ 440.00
1 WG-09 Assistant Project Manager for one week	=	$ 366.00
1 WG-07 Maintenance Worker for one week	=	$ 292.00
TOTAL		$1,098.00

The above cost estimates do not include:

1) Applicable costs of project-owned vehicles, equipment and tools;

2) Mowing and trimming of lawn areas in Compartments I, II, and III;

3) Special projects.

REFERENCES

Leak, William B., Dale S. Solomon and Stanley M. Filip, A Silvicultural Guide for Northern Hardwoods in the Northeast, Forest Service Research Paper NE-143, Northeastern Forest Experiment Station, Broomall, PA 1969.

The Silviculture of Oaks and Associated Species, Forest Service Research Paper, NE-144, Northeastern Forest Experiment Station, Upper Darby, PA 1970.

Society of American Foresters, Forest Cover Types of North America, Bathesda, MD 1954.

U.S. Army Corps of Engineers, New England Division, Environmental Assessment of the Operation and Maintenance of Colebrook River Lake, West Branch Farmington River, Colebrook, Connecticut and Sandisfield and Tolland, Massachusetts, Waltham, MA 1974.

U.S. Department of Agriculture, Soil Conservation Service in cooperation with the Connecticut Agricultural Experiment Station and Storrs Agricultural Experiment Station, Soil Survey, Litchfield County, Connecticut, November, 1970.

EXHIBIT A. TABLES

TABLE NO.	TITLE
1	Land Classification and Forest Types (Acres)
2	Timber Volume Estimate for Individual Species and Forest Cover Type
3	Scientific and Common Names of Trees and Shrubs at Colebrook River Lake
4	Scientific and Common Names of Fish and Wildlife at Colebrook River Lake
5	Initial Five Year Work Plan

EXHIBIT A

TABLE 1

LAND CLASSIFICATION AND FOREST TYPES
(Acres)

Land Classification

Forest	228.8
Open to Brush	82.7
Water (Pool Elevation 708.0 NGVD)	808.6
TOTAL	1,120.1

Management Compartments (Fee Lands)

Project Operations - Compartment III	179.0
Recreation (Intensive Use) - Compartment II	15.6
Reserve Forest Land (Wildlife Management) - Compartment I	38.0
Compartment IV	155.4
TOTAL	388.0
Flowage Easements	1,230.0
GRAND TOTAL	1,618.0

Forest Types

White Pine	
21-2-A	61.0
Hemlock	
23-4-A	10.0
Sugar Maple - Beech - Yellow Birch	
25-3-A	24.3
25-3-B	5.0
25-4-A	67.1
White Oak - Red Oak - Hickory	
52-3-A	56.4
52-4-A	5.0
TOTAL	228.8

EXHIBIT A

TABLE 2

TIMBER VOLUME - ESTIMATES FOR INDIVIDUAL SPECIES AND FOREST COVER TYPES

Board Foot: International 1/4 - Inch Rule

SAF Type	Acres	BA/A	Volume/Acre by Species Hardwood	Volume/Acre by Species Softwood	Total Volume by Type Hardwood	Total Volume by Type Softwood	Total
21	61.0	52.5	RO	-	1,340	-	1,340
			-	WP	-	15,745	15,745
			-	EH	-	670	670
23	10.0	90	RO	-	1,340	-	1,340
			BB	-	2,345	-	2,345
25	96.4	110	AB	-	12,060	-	12,060
			RM	-	8,375	-	8,375
			SM	-	2,010	-	2,010
			BB	-	4,355	-	4,355
			YB	-	1,005	-	1,005
			WA	-	1,340	-	1,340
			-	EH	-	24,790	24,790
52	61.4	40	RO	-	15,075	-	15,075
			SH	-	670	-	670
			-	EH	-	2,010	2,010
					49,915	48,575	98,490

AB = American Beech
BB = Black Birch
EH = Eastern Hemlock
RM = Red Maple
RO = Red Oak
SM = Sugar Maple
SH = Shagbark Hickory
WA = White Ash
WP = White Pine
YB = Yellow Birch

NOTE: Inaccessible area of Compartment IV A (SAF Type 52; 41 acres) not inventoried.

EXHIBIT A

TABLE 3

SCIENTIFIC AND COMMON NAMES OF TREES AND SHRUBS
AT COLEBROOK RIVER LAKE

TREES

Scientific Name	Common Name
Acer rubrum	Red Maple
Acer saccharum	Sugar Maple
Betula lenta	Black Birch
Betula alleghaniensis	Yellow Birch
Betula papyrifera	Paper Birch
Betula populifolia	Gray Birch
Carpinus caroliniana	Ironwood
Carya glabra	Pignut Hickory
Carya ovata	Shagbark Hickory
Crataegus spp.	Hawthorn
Fagus grandifolia	American Beech
Fraxinus americana	Northern White Ash
Juniperus virginiana	Eastern Red Cedar
Liriodendron tulipifera	Tulip Tree
Picea glauca	White Spruce
Picea rubens	Red Spruce
Pinus rigida	Pitch Pine
Pinus strobus	Eastern White Pine
Populus grandidentata	Bigtooth Aspen
Populus tremuloides	Quaking Aspen
Prunus pensylvanica	Pin Cherry
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak
Thuja occidentalis	Northern White Cedar
Tsuga canadensis	Eastern Hemlock
Salix nigra	Black Willow

SHRUBS

Scientific Name	Common Name
Amelanchier canadensis	Shadbush
Alnus rugosa	Speckled Alder
Comptonia peregrina	Sweetfern
Cornus florida	Flowering Dogwood
Cornus stolonifera	Red-Osier Dogwood
Eleagnus umbellata	Autumn Olive

SHRUBS (Cont'd)

Scientific Name	Common Name
Ilex verticillata	Winterberry
Juniperus communis	Dwarf Juniper
Kalmia latifolia	Mountain Laurel
Lonicera taterica	Tartarian Honeysuckle
Lindera benzoin	Common Spicebush
Rhus typhina	Staghorn Sumac
Rosa multiflora	Multiflora Rose
Rubus allegheniensis	Blackberry
Smilax spp.	Greenbriar
Taxus canadensis	Yew
Viburnum trilobum	Highbush Cranberry
Vitis spp.	Wild Grape

EXHIBIT A

TABLE 4

SCIENTIFIC AND COMMON NAMES OF FISH AND WILDLIFE
AT COLEBROOK RIVER LAKE

MAMMALS

Scientific Name	Common Name
Castor canadensis	Beaver
Didelphis marsupialis	Opposum
Erethizon dorsatum	Porcupine
Lutra canadensis	River Otter
Lynx rufus	Bobcat
Marmota monax	Woodchuck
Mustela vison	Mink
Odocoileus virginianus borealis	Whitetail Deer
Ondatra zibethicus	Muskrat
Procyon lotor	Raccoon
Sciurus carolinensis	Gray Squirrel
Sylvilagus floridanus	Eastern Cottontail
Sylvilagus transitionalis	New England Cottontail
Tamias striatus	Eastern Chipmunk
Tamiasciurus hudsonicus	Red Squirrel
Urocyon cinereoargenteus	Gray Fox
Vulpes fulva	Red Fox

FISH

Scientific Name	Common Name
Catostomus commersoni	White Sucker
Esox niger	Chain Pickerel
Ictalarus natalis	Yellow Bullhead
I. nebulosis	Brown Bullhead
Lepomis gibbosus	Bluegill
Micropterus dolomieui	Smallmouth Bass
Micropterus salmoides	Largemouth Bass
Morone americana	White Perch
Notemigonus crysoleucas	Golden Shiner
Onchryncus nerka	Kokanee (landlocked) Sockeye Salmon
Perca flavescens	Yellow Perch
Salmo gairdneri	Rainbow Trout
Salmo trutta	Brown Trout
Salvelinus fontinalis	Eastern Brook Trout
Semotilus corporalis	Fallfish

WATERFOWL AND UPLAND BIRDS

Aix sponsa	Wood Duck
Anas platyrhynchos platrhynchos	Mallard Duck
Anas rubripes	Black Duck
Branta canadensis	Canada Goose
Mergus merganser americanus	American Merganser
Bonasa umbellus	Ruffed Grouse
Phasianus colchicus torquatus	Ring-necked Pheasant
Philohela minor	Woodcock

OCCASIONAL SIGHTINGS OF BIRDS

Scientific Name	Common Name
Ardia herodias	Great Blue Heron
Buteo jamaicensis	Red-tailed Hawk
Butorides virescens virescens	Green Heron
Haliaeetus leucocephalus	Bald Eagle
Meleagris gallopavo silvestris	Eastern Wild Turkey
Pandion halioetus carolinensis	Osprey

REPTILES

Due to the remoteness of the project, the following venomous snakes are probably present.

Scientific Name	Common Name
Agkistrodon contotrix mokasen	Northern Copperhead
Crotalus horridus horridus	Timber Rattlesnake

EXHIBIT A

TABLE 5

INITIAL FIVE YEAR WORK PLAN

Annual work for the initial five year period covered by this plan includes but is not limited to:

CY 82

WORK ITEM	DATE
1. Prepare management prescriptions, Compartments I, II, III, IVA & IVB	Mar-Apr
2. Prune wildlife shrubs, Compartments I, III	Mar-Apr
3. Install wood duck boxes, Compartment I	Feb-Mar
4. Block off or obliterate unnecessary vehicle access points, Compartment IVB	Apr
5. Plant wildlife shrubs, Compartment IVA, IVB	Apr-May
6. Boundary line monumentation/marking (contract)	Jun-Oct
7. Succession control mowing, Compartment IVB	Jul

CY 83

1. Thin conifer plantations, Compartment III	Jan-Mar
2. Plant wildlife shrubs, Compartments IVA, IVB	Apr-May
3. Stabilize eroded areas, Compartment IVB	Apr-Jun
4. Complete marking/maintenance of boundary line	Oct-Nov
5. Thin White Pine Stands (TSI), Compartments IVA, IVB	Oct-Dec

CY 84

1. TIS fuelwood permits, Compartment IVB	Mar-Apr
2. General Liminological (aquatic) and Creel Surveys (Lake and River)	May-Jun
3. Open area maintenance, Compartments IVA, IVB	Jul
4. Improve access road from boat ramp to old Route 8, Compartment II	Aug-Sep

CY 85

1. Plant conifer understory cover, Compartments I, III	Apr-May
2. Construct management access to Compartment IVA	Aug-Sep
3. Establish open areas, Compartment III	Sep-Oct
4. Remarking/maintenance of boundary	Oct
5. Assess potential sale of timber, Compartment III	Nov-Dec

CY 86

1.	Revise Five Year Plan	Jan-Feb
2.	Open area maintenance	Jul
3.	Conduct timber sale (if feasible), Compartment III	Oct-Dec

EXHIBIT B

MAPS

MAP	TITLE
1	Forest Compartments and Cover Types
2	Wildlife Management Recreation Areas

PLATES

PLATES	TITLE
1	Allocation of Storage

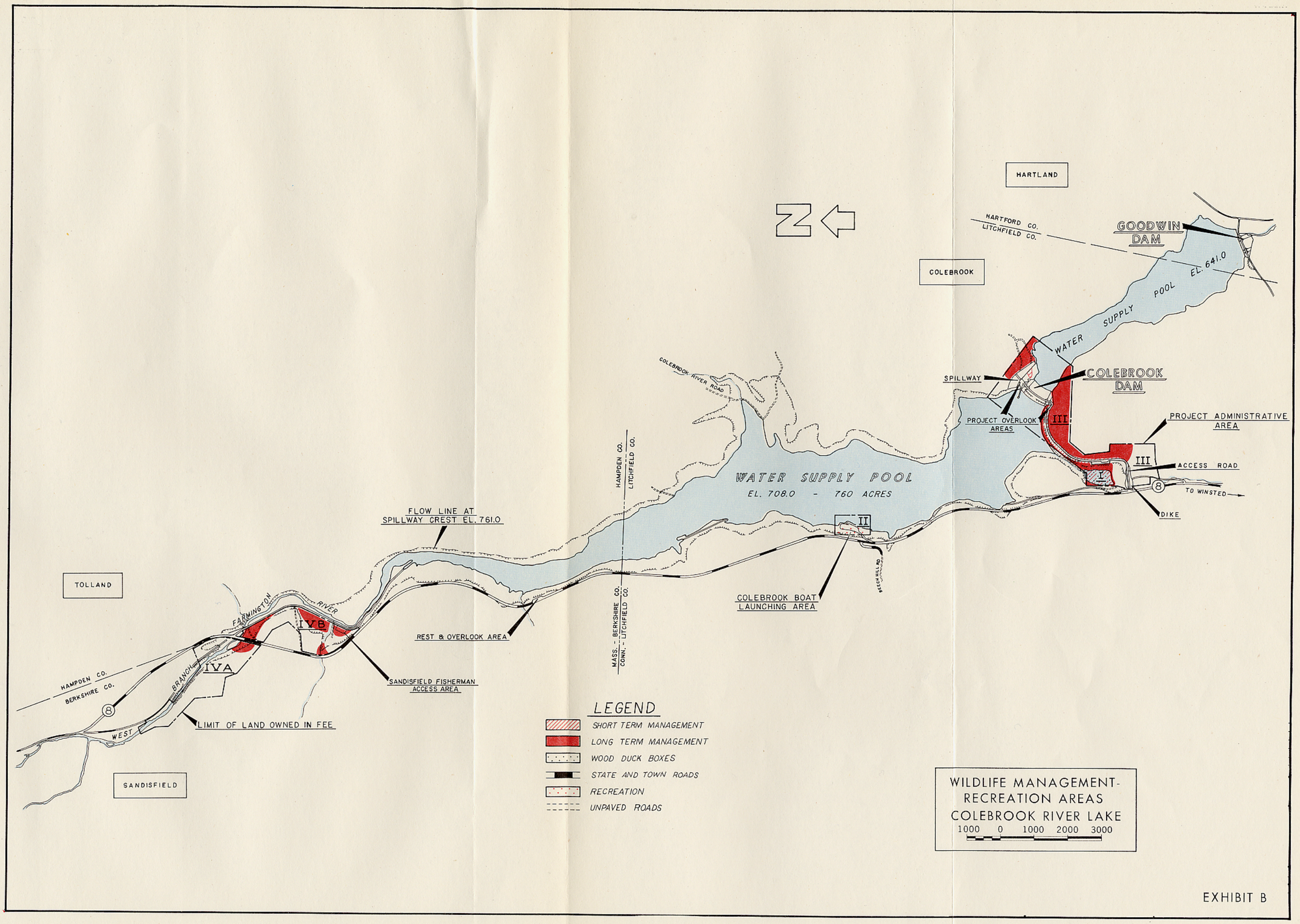
N
HARTLAND
COLEBROOK
TOLLAND
SANDISFIELD
HARTFORD CO.
LITCHFIELD CO.
GOODWIN DAM
EL. 641.0
WATER SUPPLY POOL
COLEBROOK DAM
SPILLWAY
PROJECT OVERLOOK AREAS
III
PROJECT ADMINISTRATIVE AREA
ACCESS ROAD
TO WINSTED
DIKE
COLEBROOK RIVER ROAD
HAMPDEN CO.
LITCHFIELD CO.
WATER SUPPLY POOL
EL. 708.0 - 760 ACRES
I
II
FLOW LINE AT SPILLWAY CREST EL. 761.0
BEECH HILL RD.
COLEBROOK BOAT LAUNCHING AREA
MASS. - BERKSHIRE CO.
CONN. - LITCHFIELD CO.
REST & OVERLOOK AREA
FARMINGTON RIVER
IVB
IVA
SANDISFIELD FISHERMAN ACCESS AREA
HAMPDEN CO.
BERKSHIRE CO.
WEST BRANCH
LIMIT OF LAND OWNED IN FEE
LEGEND
SHORT TERM MANAGEMENT
LONG TERM MANAGEMENT
WOOD DUCK BOXES
STATE AND TOWN ROADS
RECREATION
UNPAVED ROADS
WILDLIFE MANAGEMENT-
RECREATION AREAS
COLEBROOK RIVER LAKE
1000 0 1000 2000 3000

EXHIBIT B

MANAGEMENT COMPARTMENTS	
COMPARTMENT I (38.0 ACRES)	RESERVE FOREST LAND (WILDLIFE MANAGEMENT)
COMPARTMENT II (15.6 ACRES)	RECREATION - INTENSIVE USE
COMPARTMENT III (17.90 ACRES)	PROJECT OPERATIONS
COMPARTMENT IVA (87.3 ACRES)	RESERVE FOREST LAND (WILDLIFE MANAGEMENT)
IVB (68.1 ACRES)	

TOTAL FEE : 388 ACRES
FLOWAGE EASEMENT : 1,230 ACRES

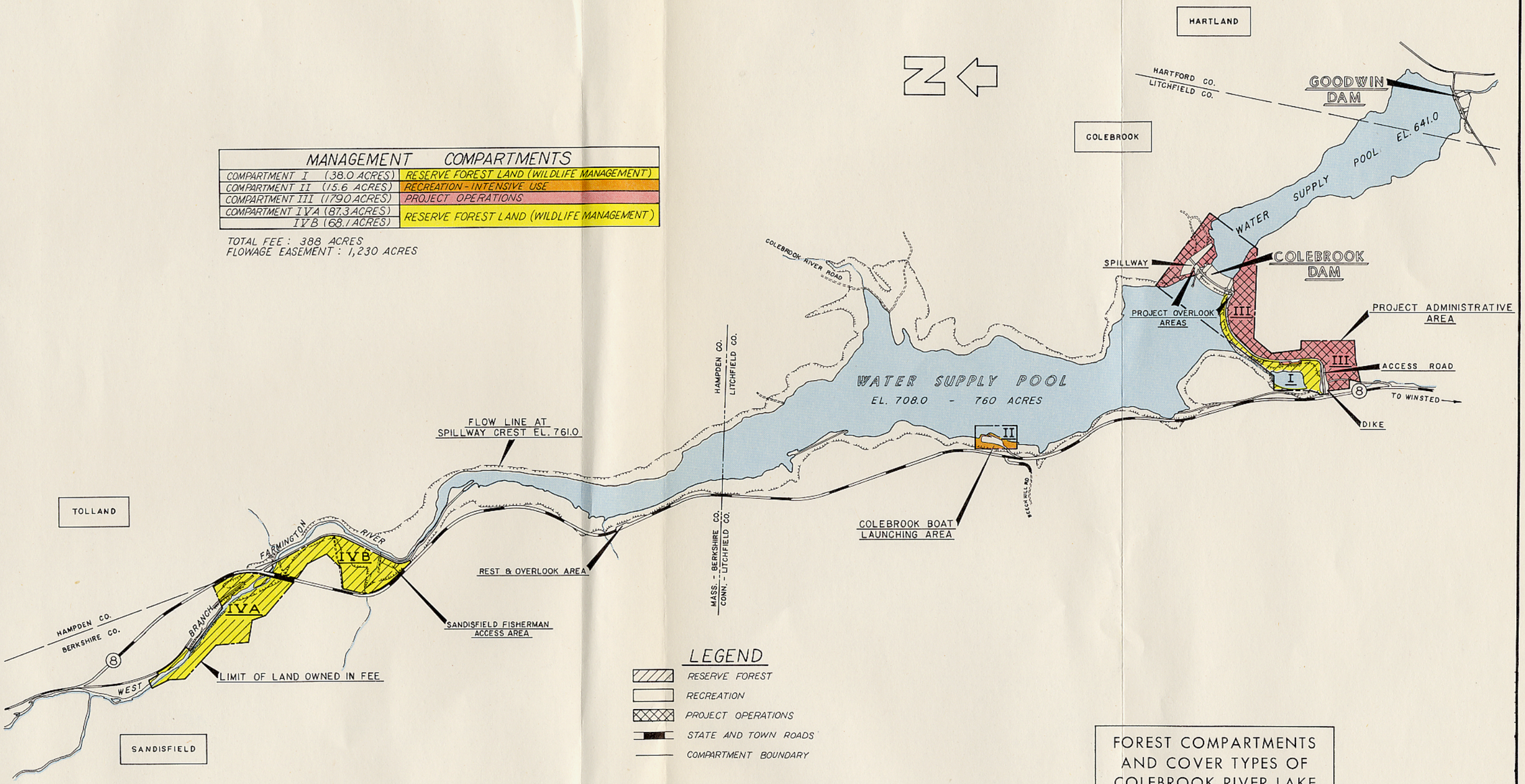

EXHIBIT B