

**State of New Hampshire**

**BIENNIAL REPORT**

*of the*

**Forestry and Recreation  
Commission**

*For the Two Fiscal Years  
Ending June 30, 1946*



*Driving Pulpwood—Swift Diamond River*

# Report

*To His Excellency, the Governor  
and the Honorable Council:*

The Forestry and Recreation Commission submits herewith its report of the work of the department for the years 1945 and 1946. It contains a complete record of activities, with detailed accounting of expenses and descriptions of accomplishment, as prepared by the State Forester and the Recreation Director with the assistance of the administrative staff.

This biennial period has been characterized by the difficulty of operating under the limited war-time finances and personnel in the face of the heavily increased demands on our services. The problems of this transition period, however, have been met satisfactorily in most instances and the essential services have been maintained.

W. ROBINSON BROWN,  
HARRY K. ROGERS,  
OWEN JOHNSON,  
RANDALL E. SPALDING,  
CHARLES E. GREENMAN,

*Forestry and Recreation Commission*

JOHN H. FOSTER, *State Forester*

RUSSELL B. TOBEY, *Recreation Director*

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# FORESTRY and RECREATION COMMISSION

5 MEMBERS

## FORESTRY DIVISION

DISTRICT FOREST ADVISORY BOARDS  
30 MEMBERS

### FEDERAL COOPERATION

### ADMINISTRATION and PUBLIC RELATIONS STATE FORESTER

1 chief clerk, 1 senior clerk stenographer, 1 clerk stenographer

### COOPERATION with STATE and TOWN AGENCIES

**BLISTER RUST CONTROL**  
1 Federal & State Agent  
1 clerk stenog.

**FOREST FIRE SERVICE**  
1 Administrative Assistant  
1 Jr. Accountant  
3 Fire Control Assistants

**REFORESTATION**  
1 Assistant State Forester  
1 Forestry foreman  
2 Forestry subforemen

**STATE LANDS**  
1 Assistant State Forester

**PRIVATE FOREST MANAGEMENT**  
1 Extension Forester

**TOWN FORESTS**  
Assistant State Foresters and staff

**RESEARCH**  
1 Research Forester  
1 Assistant

**EDUCATION**  
1 Educational Assistant

**Law Enforcement**  
Staff & Field Agents  
Registration Arborists  
Sawmills  
Taxation  
Timber Cut  
Violations  
Trespass

**Surveys & Maps**  
Scouting  
Eradication

Portable sawmill  
Inspection  
Fire control training

State Forest  
Nursery  
Tree distribution  
Seed collection

Acquisition  
Rentals  
Leases  
Surveys & Maps  
Land Titles

Assistance to private owners  
Marketing  
Management

Town Surveys  
Compilation of Records

Surveys  
Forest Pests  
Resources  
Statistics  
Experiments  
Consultant, forest management

Publicity  
Press  
Radio  
Publications  
Schools  
Meetings  
Exhibits

Registration  
Arborists  
Sawmills  
Taxation  
Timber Cut  
Violations  
Trespass

**DISTRICT AGENTS**  
5 Agents  
Part-time fire chiefs

**DISTRICT CHIEFS**  
4 full-time  
2 assistants

**Storage and Distribution**  
Town Fire Tools

**OPERATIONS**  
1 Forestry Foreman  
Timber Sales  
Stand Improvement  
Planting

**COUNTY FORESTERS**  
7 county foresters

**TOWN FOREST COMMITTEES**  
Tree wardens

**FOX RESEARCH FOREST**  
1 Forestry foreman

**COOPERATION with Soil Conservation Service**

**COOPERATION with STATE and TOWN AGENCIES**

**Clerk Dispatchers**  
3 full-time

**FIRE LOOKOUTS**  
30 watchmen

**TOWN WARDENS & DEPUTIES**

**FIRE PATROL**  
2 State patrolmen  
1015 Association Patrolmen  
150 Railway Patrolmen  
150 Highway Patrolmen

**COOPERATION with Soil Conservation Service**

**COOPERATION with STATE and TOWN AGENCIES**

**COOPERATION with STATE and TOWN AGENCIES**

**COOPERATION with STATE and TOWN AGENCIES**

**COOPERATION with STATE and TOWN AGENCIES**

## PUBLIC FORESTS

### STATE FORESTS AND RESERVATIONS

THE STATE acquired eight tracts totalling 409 acres of forest land during the past biennium. The total area acquired during the biennium was reduced by the conveyance by the state of two tracts, totalling 82 acres. These additions and reductions resulted in a net addition of 327 acres. The total listed in the 1943-44 report was 50,292 acres; the recent net increase of 327 acres makes 50,619 acres now under the supervision of the Forestry and Recreation Commission.

Name	Town	Area	Year	How Acquired
Curtiss Dogwood	Lyndeboro	14	1945	Gift
Echo Lake Addition	Conway	6	1946	Condemnation
Franconia Notch Addition	Franconia	75	1946	Gift and \$2,700
Hemenway Addition	Tamworth	1	1946	Gift
Madison Boulder	Madison			
Gerry Lot	Madison	8	1946	Gift
Kennett Lot	Madison	3	1946	Gift
Rhododendron Grove	Fitzwilliam	300	1946	Gift
Warner Hill	Derry	2	1945	\$400
Total Acquired		409	Acres	
Bellamy Park	Dover	6	1946	Conveyed by State
Boardman	Haverhill	76	1946	Conveyed by State
Total Conveyed		82		
Net Addition		327	Acres	
Last Reported		50,292		
Present Acreage		50,619	Acres	(126 tracts, located in 97 towns)

#### Curtiss Dogwood Reservation

A stand of flowering dogwood (*Cornus florida*), which is an uncommon tree in New Hampshire and of rare beauty during the spring blossoming period, has at last been acquired by the state after much agitation by many individuals and public organizations. The acquisition was made possible by Mr. Frederic H. Curtiss of Boston and Wilton who offered to pay for the purchase of an area of 14 acres. The stand is located in Lyndeboro, about one mile from Wilton Village and is partly on the main highway. Public attention was attracted to this area in 1933 when an effort was made to enlist support and funds to acquire the property as a public reservation in order to preserve the beauty and unusual character of this growth for all time. During depression and war years many delays and obstacles were encountered without anything being accomplished. In the meantime several small lots of land were sold and cottages built along part of the roadside. Not until recently has the establishment of a public reservation been made possible by the generous offer of Mr. Curtiss. A suitable marker has been installed and improvements will be made as funds become available.

### Madison Boulder State Reservation

For many years the state has been interested in the possible acquisition of Madison Boulder, located in the Town of Madison, N. H. This huge rock, without a single fissure, is 30 feet wide by 40 feet high by 75 feet long and weighs 7,650 tons. It lies in a valley about one and one-half miles north of the main highway from Madison to Conway. It is reached by a town road which terminates at the boulder. According to geologists, this mass of granite was carried about two miles from its original location by the glacial ice sheet thousands of years ago.



*Madison Boulder.*

Two prominent families, long connected with the lumber business, claimed ownership of this rock, the Gerry family of Madison and the Kennett family of Conway. Mr. Leon Gerry, Deputy State Bank Commissioner is conveying by gift about eight acres of forest land and the easterly part of the boulder. Messrs. Frank E. and Robert H. Kennett are deeding by gift about three acres and the westerly portion of the rock. It is expected that the Town of Madison will undertake road improvements during the coming year to allow a greater number of visitors to have access to this huge rock.

### Echo Lake Addition

In May, 1943 the state acquired by special appropriation and private contributions the Echo Lake property near North Conway. This valuable tract including the lake directly under White Horse Ledge is bounded on the east by the West Side road to Bartlett. The only entrance at the present time to this recreational area is from this road. In order to protect this property, the acquisition of a strip of forest land extending the same length on the easterly side of the Bartlett road was deemed necessary. Repeated efforts to purchase about six acres were of no avail and

the Governor and Council condemned the area in June, 1946. Upon filing the condemnation papers with the Clerk of Carroll County, the state acquires ownership of this small strip of land while the actual damages or value of the property will be determined by the Court during the coming year.

#### **Franconia Notch Addition**

The state received by gift all the title which Mrs. Charles H. Greenleaf of Princeton, New Jersey owned in a 40 acre lot in Franconia, N. H. This tract of forest land, which is just north of Echo Lake, is adjacent to the Franconia Notch Reservation. Mrs. Greenleaf made this gift in memory of her husband who once held title to much of the land in the Notch and was owner and manager of the Profile House. Both Mrs. Ida E. Elting of Woodbury, Connecticut and her brother Richard T. Eastman of Groveton, N. H., held interests in this lot which were purchased by the state for \$200 in order to acquire complete title.

The state subsequently obtained an option from Mrs. Elting to purchase 35 acres of forest land adjacent to this lot for \$2,500. This tract, of high recreational value because of its location near the Tramway, lies just south of the 40 acre Greenleaf tract and practically completes the state plan for forest land acquisition in this part of the Notch. The addition of these two lots increases the Franconia Notch Reservation acreage by 75 acres bringing the total to 5,319 acres.

#### **Hemenway Addition**

A small tract of forest land of about one acre, located on the westerly side of the Chinook Trail Highway in the Town of Tamworth, has been deeded by gift to the state by Frank E. and Robert H. Kennett of Conway, N. H. This roadside area, containing about 10 M bd. ft. of hemlock, lies on both sides of Swift River and is adjacent to the Hemenway State Reservation. The acquisition now extends the state ownership along this attractive highway.

#### **Rhododendron State Reservation**

An important acquisition was the gift from the Appalachian Mountain Club of 300 acres of forest land, containing a rhododendron grove, in the Town of Fitzwilliam. An 18th century farmhouse equipped with modern improvements, installed by the Club, was also included in the gift. In 1902 the Appalachian Mountain Club was given this tract, provided that the rhododendron area be held in perpetuity as a reservation for the public benefit. The farmhouse was remodeled and used as a lodge for members of the Club. This property is situated at an elevation of over 1200 feet, two and a half miles from the village of Fitzwilliam, on the old Richmond road and commands an excellent view of Mount Monadnock. Since 1942 the lodge has not been operated and visits by members of the Club have decreased. The Club finally decided, by vote taken on December 12th, 1946, to offer the entire reservation of land and buildings to the state as a gift, subject to the same trust with respect to the rhodo-





*Cottage on Rhododendron*

*Recreation.*

dendron area. The flowering of the 16 acres of rhododendrons about the middle of July is of special interest since it is perhaps the only large area of compact rhododendrons north of the Southern Appalachian Mountains. The surrounding forest land also includes stands of white pine, hemlock and hardwoods. An attractive woodland path leads from the cottage to the rhododendron grove.

#### **Warner Hill**

A forest fire lookout tower and cabin were built on Warner Hill in the Town of Derry in 1939. An acre of land was leased by the state from the owners, the Mears Estate, which is part of a farm of 200 acres. During the war the U. S. Army condemned and took over the area from the owners, including the land leased by the state, for radio and other communication purposes. In November, 1944 the Army abandoned its project and left all improvements desired by the state to the Mears family. An agreement was finally determined whereby the state acquired two acres of land, with an improved road leading to the summit from the highway, for \$400. This lookout station is now the dispatching center for fires in Rockingham County.

#### **Sale of Boardman Farm**

An abandoned farm of 76 acres of open land with a small farm house and barn, located in the town of Haverhill, N. H., was acquired by the Emergency Relief Administration of the Federal Government in 1936 in connection with the development and operation of a transient camp on the Black Mountain State Reservation. The farm property was turned over to the state without obligation at the time of closing the E.R.A. activities in New Hampshire. The farm house was improved but never used or furnished, although the grass land has been rented each season. A seasonal permit for 1946 to occupy the farm house was given to Mr. Roy F. Hillmer of Garden City, New York. The location and surroundings appealed to the Hillmer family and they finally decided to purchase the property if possible and become permanent residents of the town of Haverhill. The Commission believed a sale to be in the best interest of the state and decided that \$5,000 was a fair considera-

tion. The price was acceptable to Mr. Hillmer and approved by the Governor and Council who later executed a quitclaim deed.

#### Portion of Bellamy Park Deeded

Bellamy Park, in the outskirts of the city of Dover, was acquired by the state in 1935. As a part of its development a baseball diamond and football field were later laid out and in recent years leased to the city of Dover. This area including a parking lot, amounts to about six acres along the entrance highway. In order to simplify the operation of the Park, the Commission believed that the athletic grounds should be deeded outright to the city for a nominal sum. This was approved by the Governor and Council who executed a deed to the city of Dover.

### Utilization of State Lands by Lease

1945-1946

Tract	Lessee	Amount	
		1945	1946
Annett	Cambridge Council, Boy Scouts	\$ 10.00	\$ 10.00
Blair & Livermore Falls	Public Service Company	10.00	10.00
Boardman	Roy F. Hillmer		100.00
Boardman	Carroll Stoddard	50.00	50.00
Cardigan Mountain	Appalachian Mountain Club	10.00	10.00
Casalis	Elmer Dodge	140.00	48.00
Connecticut Lakes	Walter S. Aiken	10.00	10.00
Cotton Island	Comstock Heirs	10.00	10.00
Crawford Notch	Ernest E. Gile	3,010.00	3,010.00
Crawford Notch	Clifford E. McGlauffin	10.00	10.00
Crawford Notch	Charles E. Young	10.00	10.00
Franconia Notch	Appalachian Mountain Club	10.00	10.00
Franconia Notch	Dartmouth Outing Club	25.00	
Franconia Notch	N. H. University Outing Club	10.00	10.00
Franconia Notch	Public Service Company		7.50
Haven	Charles M. Mills	5.00	5.00
Hemenway	James K. Selden	400.00	400.00
Hemenway	Boston Council, Boy Scouts	25.00	25.00
Hemenway	Tamworth Outing Club	1.00	
Intervale Ski Slope	Intervale Ski Area, Inc.		
Ingalls Island	A. C. & Lena M. Leavitt	10.00	10.00
Kearsarge Mountain	N. H. Electric Cooperative		
Kearsarge Mt. CCC Camp	Warner Young People's Group	1.00	12.00
Kearsarge Mt. CCC Camp	Agricultural Services, Inc.		25.00
Mt. Prospect	Mt. Prospect Outing Club		1.00
Mt. Prospect	Arthur G. Sherman	75.00	75.00
Mt. Prospect	Laurence W. Moody		10.00
North Pond	Ledger J. Christian	10.00	10.00
Pillsbury	Leo Clark	125.00	125.00
Pillsbury	Blanche Annan	25.00	25.00
Russell	Public Service Company		6.72
Russell-Abbott	Public Service Company		2.80
Scribner-Fellows	Public Service Company	7.50	7.50
Sky Pond	N. H. Electric Cooperative	2.00	2.00
Stockdale	Charles H. Nelson	240.00	240.00
Sugar Hill	Earl P. Freese	1.00	1.00
Taylor	Edward Offhaus	25.00	25.00
Waldron	Town of Northwood		1.00
Wantastiquet	Central Vermont Public Service Corp.		2.00
Total		\$4,267.50	\$4,316.52

## FOREST OPERATIONS

### Connecticut Lakes

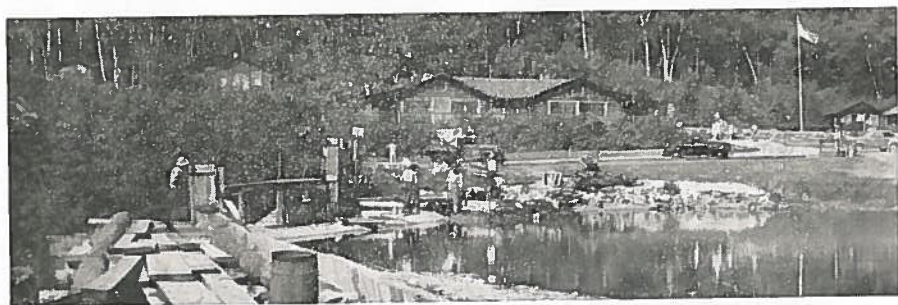
Caretaker service on the Connecticut Lakes Reservation continued as in previous biennial periods. Patrol of the road and intensively used areas was maintained during dry weather on a full time basis. Following rainy weather all areas were checked once daily and the balance of the caretaker's time spent on forest improvements, roadside cleanup and maintenance. Work done on these projects released 40 acres of young spruce and fir, planted 5,000 trees, re-blazed and painted two miles of boundary line and helped rebuild six miles of the Deer Mt. telephone line.

### Crawford Notch

Following two years of inactivity caretaker service was restored in the summer of 1945 and the usual pickup and care of the roadside and public use areas, as well as the general maintenance of all property was resumed. In 1945 the caretaker's and assistant caretaker's expenses amounted to \$1,321.26. Miscellaneous repairs and supplies cost \$267.97. The completion of two new cabins cost \$551.57, making a total for the year of \$2,140.80. The total income for 1945 was \$3,534.05. In 1946 the same general supervision prevailed in all public use areas and buildings. Assistance was given the caretaker in replacing foot bridges, ladders and side logs on the more important trails. The salaries of the caretaker and the assistant caretaker, plus labor expense, amounted to \$1,376.40. Miscellaneous tools, repairs and supplies cost \$454.64. An expenditure of \$5,587.97 was made for rebuilding the dam, vehicle bridge, two foot bridges, improving the campground, access road and parking area at the Willey House Site.

### Timber Sales at Forest Nursery

A small logging operation was started in the winter of 1944 and 1945 but abandoned because of the depth of snow. In the winter of 1945 and 1946 a cutting of 75,400 feet of logs was made at a cost of \$9.15 per M. and yarded at \$5.75 per M., leaving a net return of \$7.10 per M. for stumpage.



*New dam under construction in Crawford Notch, 1946.*

Forest Improvement and Recreational Fund  
Fiscal Operations July 1, 1944-June 30, 1946

Forestry Division

<i>Name of Area</i>	<i>Income</i>	<i>Expenditures</i>	<i>Balance</i>
Balance July 1, 1944 .....	\$	\$	\$26,618.55
Annett State Forest .....	221.00	49.80	171.20
Bear Brook State Forest Park .....	441.02	2,214.30	-1,773.28
Belknap State Reservation .....		347.87	-347.87
Black Mountain State Forest .....	175.00	190.85	-15.85 (1)
Casalis State Forest .....	135.00	40.83	94.17
Connecticut Lakes State Park .....	20.00	367.64	-347.64
Cunway Common Lands .....	370.02		370.02
Crawford Notch State Reservation .....	4,944.28	3,712.92	1,231.36
		192.70	-192.70
Fox Research Forest .....	556.18	89.80	466.38
Franconia Notch State Reservation .....	544.39	1,523.26	-978.87
Hampton State Beach .....	30.00	641.01	-611.01
Hemenway State Reservation .....	3,851.70	258.99	3,592.71
Kearsarge Mt. CCC Camp .....	1.00	60.00	-59.00
Lead Mine State Forest .....	200.00		200.00
Merrimack River State Forest .....	12.00	82.04	-70.04
Moose Brook State Forest Park .....	100.00		100.00
Pillsbury State Reservation .....	264.80	181.23	83.57
State Forest Nursery .....	2,130.39	1,687.54	442.85
Stockdale State Forest .....	480.00	23.25	456.75
Taylor Lot .....	50.00		50.00
Wadleigh State Park .....	268.00	38.12	229.88
Warner Hill .....	2.00	402.10	-400.10
Weeks, John W. Memorial .....	75.00	405.84	-330.84
Other Areas (18) .....	188.24	54.76	133.48
Recreation—General .....		13,476.33	-13,476.33 (2)
Administration .....	5.00	1,517.19	-1,512.19
Total	\$15,065.02	\$27,558.37	-\$12,493.35
Balance June 30, 1946 .....			\$14,125.20

(1) Including Boardman Farm.

(2) Including transfer December, 1945, of \$6,941.18 to Recreation Special Fund

## TOWN FORESTS

**I**NFORMATION from boards of selectmen concerning town forests has not been requested since 1941. Prior to that date a comprehensive analysis of the town forest situation was made with the towns in 1938. At that time valuable facts from practically all of the towns were obtained by a joint questionnaire sent by the Tax and Forestry Commissions. During the past two years information has been received from time to time in regard to improvements and changes of acreage in certain town forest lands. The Commission's records show that 156 towns now hold title to 55,086 acres of forest land. The following table is of interest since it indicates how these lands were acquired, including city water supply areas.

## Town and City Forests by Counties\*

County	No. of Towns Owning Forest Land	Area by Method of Acquisition				City Water No.	Supply Forests Area Acres
		Tax Title	Gift	Purchase Acres	Total		
Belknap	10	1,725	278	60	2,063	1	193
Carroll	10	679	340	185	1,204		
Cheshire	18	4,645	886	710	6,241	1	2,520
Coos	8	835	150	5,308	6,293		
Grafton	22	9,288	55	2,848	12,496		
Hillsborough	23	3,393	1,626	989	6,008	1	5,100
Merrimack	21	7,877	1,641	30	9,548	2	1,233
Rockingham	25	3,967	1,026	57	5,050	1	199
Strafford	8	2,693	179	190	3,062	3	336
Sullivan	11	2,290	175	656	3,121		
	156	37,392	6,356	11,033	55,086	9	9,581

\*As of January 1, 1946 Grand Total 165 Cities and Towns own 64,667 Acres

A study of the table shows that 64% of the towns of the state own forest land and these towns have acquired 68% of this land by tax title. Coos County, having only eight towns with 6,293 acres of forest land, has about the same acreage as Cheshire County with 18 towns. This high acreage for Coos is due to the town of Gorham having acquired 4,690 acres for a water supply area. Grafton County has double the acreage of any other county due to the acquisition of large areas by a few towns by tax title and for water supply purposes. A comparison with the summary table in the 1937-38 report plainly indicates that the towns are continually changing their acreage of forest land which they receive by tax title and later return to the tax lists. It is impossible for the Forestry and Recreation Commission to keep up-to-date information on these changes unless selectmen of towns render regular reports of all transactions affecting forest land.

There are several towns in the state which are making valuable improvements on their forest lands and sales of stumpage which yield good returns. Warren has completed a cutting contract returning a revenue to the town and still leaving young stands of softwood; Dunbarton sold about 165 M bd. ft. of white pine and hemlock in 1945; Lempster, with over 1,000 acres acquired by tax title, recently sold several hundred cords of softwood pulpwood at a good price; Milton cut a good volume of white pine; other towns are operating their lands, obtaining forest products for use in schools, town houses or making sales to private owners.

The town of Northumberland has just completed a woods operation which does credit to those who have interested themselves in the project. In 1926 the town needed a gravel pit but was forced to buy 38 acres of forest land for \$300 to obtain it. During a period of six years the town moved about 8,000 yards of gravel for road improvement. In 1943 stumpage suitable for cutting was sold for \$1,356, leaving a satisfactory second crop for future operations.

# WHITE MOUNTAIN NATIONAL FOREST

## U. S. FOREST SERVICE

**P**ERHAPS THE most significant postwar event occurring on the White Mountain National Forest came about with the realization that the hurricane fire hazard had abated to a condition closely approaching normal. During the period since the hurricane the Forest operated largely on a custodial basis. Practically all available funds and manpower were used on fire prevention and preparedness work. With the abatement of the fire hazard the Forest's major effort has been redirected to the field of resource management, with fire protection playing an important but second fiddle.

The first step in this reconversion came with the establishment of a new Ranger District at South Paris, Maine. This was formed from portions of the old Saco and Androscoggin Districts, both of which still exist in more compact form. The number of nontechnical men per District was reduced, with a simultaneous increase in technically trained manpower.

Fire dispatching is no longer carried on from the District Ranger's office but is a function handled by a designated lookout-dispatcher on each District.

Trail and improvement maintenance has been centralized under the supervision of the Forest Engineer in order to release the Ranger force for increased emphasis on resource management.

Wildlife management and recreation again have taken their places in the general scheme of Forest activities.



## STATE FOREST NURSERY

**N**URSERY operations for the past two years consisted of growing forest planting stock of the important native timber-producing species. The sale of planting stock to private planters showed a substantial increase over the previous biennial period and the distribution of stock for all planting was 35% more than during 1943 and 1944.

Plantings on state land were as follows: 8,000 red pine set on the Ponemah tract by Boy Scouts, under the direction of County Forester Arthur Cutter. The caretaker planted 5,000 white spruce in semi-open hardwoods on the Connecticut Lakes Reservation and 200 two-foot white spruce were planted in roadside openings on the Crawford Notch Reservation by the caretaker.

The Laconia State School planted 200 white spruce and the U. S. Army Engineers planted 2,800 red and white pine on barren areas adjacent to the Franklin Dam.

Five cities and towns were given 75,500 free trees as follows: Manchester 44,500; Keene 13,000; Pittsfield 11,000; Hanover 5,000; and Dummer 2,000.

Educational groups consisting of boys and girls clubs between the ages of nine and twenty were given a total of 112,610 trees. Members of 4-H Clubs planted 77,135 trees in eight counties as follows: Rockingham, 27,900; Hillsborough, 20,910; Belknap, 8,250; Cheshire, 7,000; Merrimack, 5,850; Sullivan, 3,500; Grafton, 1,925 and Coos, 1,800. Eight Agricultural High Schools operating under the Smith-Hughes Law planted 35,475 trees as follows: Tilton—Northfield High, Tilton, 10,750; Vilas High, Alstead, 7,000; Hopkinton High, Contoocook, 5,500; Simonds High, Warner, 5,000; Walpole High, Walpole, 3,225; Henniker High, Henniker, 3,000; Belmont High, Belmont, 900 and Weare High, No. Weare, 100.

Two acres of the nursery area were used by the State Highway Department for holding and developing roadside stock. Forest fire fighting tools were received, marked and distributed to towns throughout the state as in previous years.

In the spring of 1945 all one-year red pine seed beds showed 90 percent of the seedlings to be brown and dying when the snow melted from the beds. State and federal pathologists believed the disease to be *Lophodermium pinastri*, a fungus disease that attacks the needles of young seedlings during the growing season and causes them to die when covered with snow. An effort was made to eliminate the disease from the nursery by burning all beds and litter around them. This proved ineffective as all one-year red pine seed beds in the spring of 1946 were again 90 percent dead or dying. Dusting with bordeaux mixture was tried and resulted in trees that were not entirely dead making new growth and surviving the attack. Further inquiry reveals that European nurserymen have been successful in controlling the disease there by spray-

ing three or more times during the summer with double strength bordeaux mixture. Northern white pine is reported to be resistant to this disease.

An agreement with the Soil Conservation Service, recently organized in New Hampshire, has been drawn up and signed relative to the production and distribution of trees for use in erosion control plantings in the state. Briefly, the agreement provides for the use of state forest nursery grown stock by the Soil Conservation Service when furnishing stock to farmers, as far as the capacity of the state nursery will permit. This stock will be purchased by the Soil Conservation Service and allotted to farmers without charge. This service will in time, no doubt, very considerably increase planting by farmers, using the state nursery grown trees, although funds spent by this or any other federal agency in payment for planting stock for farmers cannot serve to increase the federal allotment to the state for nursery tree production under the Clarke-McNary Act.

Satisfactory seed of several of the important native timber-producing trees has been increasingly difficult to obtain since the early years of the war. Balsam fir has been unobtainable. Comparatively few nurseries are interested in this seed and the collectors, handicapped by conditions, apparently made no effort to collect any of this seed. Balsam fir bore a light crop of cones in the northern part of the state in 1944, but these cones proved to be wormy and of no value. A similar situation has existed with white spruce, which has been available only in old seed, and has not germinated satisfactorily. White and red pine received more attention than other species in the limited collections seed men could make, due to their extensive use by many nurseries. This widespread use, however, means that only limited amounts are available to each nursery.

The need of planting at the present time is so great that it seems most unfortunate to have nursery production of planting stock so limited. With three or four years necessary to produce satisfactory planting stock from seed, the demand for stock will no doubt exceed the supply.

#### Value of Nursery Stock Produced

Years Ending June 30, 1945 and June 30, 1946

	1945	1946
Trees sold to private planters	\$ 957.28	\$1,253.10
Trees given to 4-H and other juvenile clubs	298.39	274.19
Trees given to towns	332.50	167.76
Trees used on state lands	49.40	64.00
	<hr/> \$1,637.57	<hr/> \$1,759.05

*Tree planting on cutover land.*





## Nursery Output: Fall, 1944 — Spring, 1945

<i>Age of Stock</i>	<i>White Pine</i>	<i>Red Pine</i>	<i>White Spruce</i>	<i>Balsam Fir</i>	<i>White Ash</i>	<i>Total</i>
6-yr. transplants		200	1,050	1,050		2,300
5-yr. transplants		1,000				1,000
4-yr. transplants	7,050	43,600	19,550	37,800		108,000
4-yr. root-pruned seedlings	5,000	23,000	17,000			45,000
3-yr. root-pruned seedlings	19,735	18,625	36,875	12,000	2,225	89,460
	31,785	86,425	74,475	50,850	2,225	245,760

## Nursery Output: Fall, 1945 — Spring, 1946

<i>Age of Stock</i>	<i>White Pine</i>	<i>Red Pine</i>	<i>White Spruce</i>	<i>Balsam Fir</i>	<i>White Ash</i>	<i>Total</i>
4-yr. transplants	31,250	39,625	25,775	27,975		124,625
4-yr. root-pruned seedlings	12,000	16,000				28,000
3-yr. root-pruned seedlings	35,450	42,900	30,350	5,250	4,250	118,200
	78,700	98,525	56,125	33,225	4,250	270,825

## REGISTERED ARBORISTS

**T**REE SURGEONS or arborists are required to pass an examination and to be registered before engaging in tree surgery, pruning, spraying, or otherwise treating fruit, shade and forest trees except in the city or town where they reside. This is in accord with Chapter 237 of the Revised Laws passed in 1929. As provided by law, the State Forester, Commissioner of Agriculture and the State Entomologist constitute an examining board. Each individual or firm desiring to continue practice in New Hampshire must renew the registration fee of \$2 annually, upon payment of which their registration may be renewed by the board without further examination.

The purpose of registration is to protect the public from unscrupulous and unqualified persons who may represent themselves as specialists. Persons employing arborists should make sure that they are properly qualified and possess a state certificate.

Recently a new class of aerial spraying contractors has entered the field. They are also fully subject to the law requiring registration, and evidence of possession of a certificate should be required before employing them for spraying or dusting where shade, fruit, ornamental or forest trees are involved.

The list of arborists registered for practice in New Hampshire is given below.

### REGISTERED ARBORISTS—1946

- Abbott Brothers Tree Service, Wells, Maine (William F. Abbott)  
Aldrich Tree Service, Inc., 25 Eastern Ave., Dedham, Mass. (Leon F. Aldrich)  
Thomas W. Aycock, 105 Lowell Street, Peabody, Mass.  
F. H. Bailey & Sons, Inc., P. O. Box 308, Nashua, N. H.  
Barber Tree Service, Peterborough, N. H. (Eugene L. Barber)  
F. A. Bartlett Tree Expert Co., 795 Memorial Drive, Cambridge, Mass. (Wilfrid Wheeler, Jr.)  
J. Armand Bouchard, 747 Hall Street, Manchester, N. H.  
Ernest J. Chase, West Surry Road, Keene, N. H.  
Gordon Cloud, Norwich, Vermont  
Conley & Brown, 96 Conant Street, Danvers, Mass.  
Davey Tree Expert Company, Kent, Ohio  
The Dodge Associates, Main Street, Wenham, Mass. (Albert W. Dodge)  
Walter C. Douglass, R. F. D. 1, Portsmouth, N. H.  
John E. Earl, Haverhill Spraying Company, 10 Coffin Avenue, Haverhill, Mass.  
Eastern Tree & Landscape Corp., 280 Bridge Street, Dedham, Mass. (Arthur J. Hasson, Brookline, Mass.)

- Robert H. Eaton, R. F. D., Alton, N. H.
- William G. Elliott, 11 Crosby Street, Milford, N. H.
- George W. Flint, Jr., Summit Road, Keene, N. H.
- William A. Franke, 30 Cameron Street, Brookline, Mass.
- Miss Lillian A. Fraser, 145 Elliott Street, Haverhill, Mass.
- H. L. Frost & Higgins Company, 20 Mill Street, Arlington, Mass. (by  
J. Cooke White and R. D. Keene in all subjects and E. W. Higgins  
in B, C, D, and E.)
- Herbert C. Gray, Jr., 34 Water Street, Lancaster, N. H.
- Great Northern Tree Service, 574 Main Street, Laconia, N. H. (Lester W.  
Robbins)
- George L. Harkins, 250 No. Main Street, Concord, N. H.
- Jeremiah Healey, 167 Beaver Street, Hyde Park, Mass.
- Henderson & Herndon Tree Co. Inc., 9 Story Avenue, Beverly, Mass.  
(William P. Henderson)
- Henderson & Herndon Tree Co. Inc., 9 Story Avenue, Beverly, Mass.  
(Richard E. Henderson)
- John P. Herbert, 526 Washington Street, Gloucester, Mass.
- Hector Hevey, 317 Middle Street, Portsmouth, N. H.
- Hill Brothers Nursery, R. F. D. 1, Hudson, N. H.
- Royce H. Hutchins, R. F. D. 1, Plymouth, N. H.
- B. F. Lawrence Tree Expert Co., 25 Abbott Street, Greenfield, Mass.  
(Benjamin F. Lawrence)
- The Lucas Tree Expert Co., 179 Sheridan Street, Portland, Maine.  
(R. E. Billings)
- E. F. Mayberry, Lancaster, N. H.
- Robert W. Meader, Greenland, N. H.
- New England Tree Expert Co., 539 Smithfield Avenue, Pawtucket, R. I.
- Fred Ralston & Co., 19 Rector Road, Boston, Mass. (Frederick R. Ral-  
ston)
- M. L. Raymond, Wolfeboro, N. H.
- John H. Stevens, Stevens Tree Company, Sanford, Maine
- John Tierney, 16 Liberty Street, Manchester, N. H.
- W. F. Tuttle, Wolfeboro, N. H.
- Stillman E. Walter, Wolfeboro, N. H.
- Myles Standish Watson, Newington, N. H.
- William H. Welchans, R. F. D., Warner, N. H.
- Russell H. Welsh, 23 Linden Street, Exeter, N. H.
- John W. Wholley, Bradford Tree Expert Co., 4 Clinton Street, Haver-  
hill, Mass.
- Edwin S. Wise, R. F. D. 2, Winchester, N. H.

## FOREST FIRE CONTROL

**T**HE FIRE protection record of this biennium is better than average in all respects save one—that of damage. Two fires occurring unusually early in the spring of 1946, in the same part of the State and on the same day, together burned a total of nearly 400 acres and caused damage of more than \$80,000, most of which was to structures and piled lumber. Judged by the usual criteria—number of fires, their size, the damage and suppression costs—the record otherwise is gratifying, as tables published elsewhere in this report will show.

Since all areas in the State are included in protective plans, unlike the situation in some other regions of the country, the efforts of the organization here are directed to the operation and improvement of existing systems and conditions. The town forest fire wardens, with their deputies, crews, associations and federation, continue to be the bulwark of our system behind which other support is built. Thus the towns and the State working in unison receive further assistance from such State agencies as the Fish and Game Department and the Highway Department whose field personnel receive appointments as special deputy forest fire wardens. The State Police also give valuable assistance in the fields of fire investigations, radio communication and traffic control during fires. The Federal government also cooperates, notably through the U. S. Forest Service but also through other divisions concerned in forest protection, such as the unit in charge of white pine blister rust control. Private cooperation is also received from such agencies as the N. H. Timberland Owners Association and the railroads whose patrol and maintenance-of-way personnel, respectively, are also appointed as special deputy wardens. Volunteer effort is an outstanding characteristic of this system and we gratefully acknowledge our appreciation of this support.

### Review of Conditions

An ever-present source of danger during this and recent periods has been the existence of abnormally numerous and extensive cut-over areas covered with slash. In combination with dry weather and the presence of woods-workers or the peacetime resumption of outdoor vacation activities, critical danger was bound to result. Happily, the weather was favorable for the most part.

July and August at the beginning of the fiscal year 1945 were dry and some of the fires which then occurred burned deeply under the surface. Costs of suppression were therefore high. In the following spring March was abnormally hot and dry thus giving the fire danger season an early start. April and May had well distributed rains, creating favorable fire control weather during these otherwise worst months of the normal New Hampshire fire season. The largest fire of this period occurred early in April when a blaze on Uncanoonuc Mountain in Goffstown burned 250 acres.

Almost the same conditions occurred during the fiscal year 1946. There were brief dry spells in August, and March was again an early fire month but the remainder of the spring period was good. Notable fires included those mentioned earlier in this report as having caused large damage. These were in Durham and Rollinsford and burned 350 and 32 acres respectively. One other fire in Litchfield and Londonderry on April 18 was the largest of the biennium, burning 650 acres.

Wartime disruptions of manpower and equipment sources created other problems but the return of men from the service will soon have its good effect. Equipment continues short and badly needed replacements of motor vehicles, hose and other items, as well as the procurement of radio apparatus, have yet to be completed.

The following tables give the record of fire occurrence by months; statistics for 37 years of the number of fires, area burned, damage and averages; county records; railroad fire statistics; fires classified by causes and a general summary for all agencies involved:

### Number of Fires by Months

(Exclusive of Railroad Fires)

<i>Fiscal Year</i> Ending June 30, 1945		<i>Fiscal Year</i> Ending June 30, 1946	
July, 1944	25	July, 1945	11
August, 1944	65	August, 1945	19
September, 1944	12	September, 1945	7
October, 1944	13	October, 1945	12
November, 1944	7	November, 1945	2
December, 1944	1	December, 1945	1
January, 1945	0	January, 1946	0
February, 1945	0	February, 1946	0
March, 1945	57	March, 1946	163
April, 1945	112	April, 1946	92
May, 1945	17	May, 1946	55
June, 1945	10	June, 1946	40
<b>Total</b>	<b>319</b>	<b>Total</b>	<b>402</b>

### Total Number of Forest Fires, Area and Damage by Causes

For Fiscal Years 1945 and 1946

<i>Causes</i>	<i>Percent Total Number of Fires</i>	<i>Percent Total Area Burned</i>	<i>Percent Total Damage</i>
Railroads .....	16.4	7.2	1.8
Smokers .....	31.3	53.4	56.3
Burning Brush .....	24.6	13.1	2.3
Miscellaneous .....	13.8	16.9	35.3
Lumbering .....	2.3	1.7	2.7
Incendiary .....	1.2	1.2	.2
Lightning .....	4.9	.9	.3
Camp Fires .....	2.8	.7	.1
Unknown .....	2.7	4.9	1.
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

## Forest Fire Record for Thirty-Seven Years

(Exclusive of Railroad Fires)

<i>Year</i>	<i>No. Fires</i>	<i>Area Burned Acres</i>	<i>Average Area Burned Per Fire Acres</i>	<i>Damage</i>	<i>Average Damage Per Fire</i>
1910	272	9,038	33.2	\$40,000.00	\$147.06
1911	462	30,958	67.0	175,000.00	378.79
1912	344	8,474	24.6	62,000.00	180.23
1913	609	14,507	23.8	100,000.00	164.20
1914	315	8,119	25.8	53,000.00	168.25
1915	792	29,480	37.2	174,567.00	220.41
1916	128	6,630	51.8	40,075.00	313.09
1917	197	1,680	8.5	18,205.00	92.41
1918	357	8,693	24.3	94,468.00	264.61
1919	308	3,502	11.4	41,287.00	134.05
1920	138	1,996	14.4	17,681.00	128.12
1921	276	7,172	26.0	59,503.00	215.59
1922	295	9,484	32.1	94,917.00	321.75
1923	199	2,333	11.7	27,786.00	139.63
1924	330	5,351	16.2	83,347.00	252.57
1925	486	8,368	17.2	97,508.00	200.62
1926	295	8,181	27.7	115,614.00	391.91
1927	367	9,420	25.7	75,762.00	206.44
1928	271	4,714	17.4	27,090.00	99.96
1929	192	1,661	8.7	9,188.00	47.85
1930	765	18,750	24.5	93,191.00	121.82
1931	363	4,882	13.4	38,994.00	107.42
1932	485	5,080	10.5	39,760.00	81.98
1933	542	7,485	13.8	55,524.00	102.44
1934	370	2,920	7.9	10,043.00	27.14
1935	488	2,667	5.5	15,122.00	30.98
1936	387	2,011	5.2	12,548.00	32.42
1937	433	2,906	6.7	13,451.00	31.06
1938	488	4,400	9.0	20,524.00	42.06
1939	410	5,080	12.4	32,307.00	78.80
1940	691	2,069	3.0	23,827.00	34.48
1941	699	36,533	52.3	211,255.00	302.22
1942	538	4,928	9.2	24,851.00	46.19
1943	307	1,235	4.0	23,972.00	78.08
1944	496	3,422	6.9	26,213.00	52.85
35 years	14,095	284,129		\$2,048,580.00	
1945	319	1,116	3.5	4,799.00	10.59
1946	402	2,989	7.4	106,517.00	264.97
37 years	14,816	288,234		\$2,159,896.00	

## Summary of Averages

<i>Average</i>	<i>35 Years</i>	<i>1945</i>	<i>1946</i>	<i>37 Years</i>
No. Fires Per Year .....	403	319	402	400
Area Per Year (acres) .....	8,118	1,116	2,989	7,790
Damage Per Year .....	\$58,530.86	\$4,799.00	\$106,517.00	\$2,159,898.00
Area Per Fire (acres) .....	20.2	3.5	7.4	19.5
Damage Per Fire .....	\$145.34	\$10.59	\$264.97	\$145.78

## Fire Record for Fiscal Years 1945 and 1946

(Exclusive of Railroad Fires)

County	Year	Number of Fires	Total Acres Burned	Average Area Per Fire	Total Damage	Average Damage Per Fire	Total Cost of Fighting	Average Cost Fighting Per Fire
Belknap	1945	11	20	1.8 \$	8.00	\$ .73	\$ 100.24	\$ 9.11
	1946	32	73	2.3	34.00	10.63	807.87	25.25
Carroll	1945	17	23	1.4	88.00	5.18	266.36	15.67
	1946	29	198	6.8	892.00	30.76	726.38	25.05
Cheshire	1945	44	90	2.0	368.00	8.36	2,331.17	52.98
	1946	54	239	4.4	669.00	12.39	1,297.94	24.04
Coos	1945	15	28	1.9	141.00	9.40	99.25	6.62
	1946	20	103	5.2	2,291.00	114.55	411.99	20.60
Grafton	1945	35	47	1.3	256.00	7.31	2,596.23	74.18
	1946	29	115	4.0	3,152.00	108.69	339.13	11.69
Hillsborough	1945	60	509	8.5	3,053.00	50.88	3,552.50	59.21
	1946	75	650	8.7	5,821.00	77.61	2,807.74	37.44
Merrimack	1945	35	62	1.8	151.00	4.31	737.88	21.08
	1946	45	122	2.5	539.00	11.98	884.15	19.65
Rockingham	1945	58	134	2.3	465.00	8.02	899.79	15.51
	1946	74	698	9.4	7,804.00	106.27	2,586.89	34.96
Strafford	1945	23	183	8.0	198.00	8.61	541.15	23.53
	1946	23	721	31.3	84,033.00	3,653.61	1,711.94	74.43
Sullivan	1945	21	20	1.0	71.00	3.38	417.96	19.90
	1946	21	70	3.3	1,222.00	58.19	723.62	34.46
State Totals	1945	319	1,116	3.5 \$	4,799.00	\$ 15.04	\$11,542.50	\$36.18
	1946	402	2,989	7.4	\$105,517.00	\$264.97	\$12,297.65	\$30.59

## Railroad Fire Record for Fiscal Years 1945 and 1946

Year	No. of Fires	Total Area Burned Acres	Average Area Per Fire Acres	Total Damage	Average Damage Per Fire
1945	77	201	2.6	\$ 745.00	\$ 9.68
1946	65	118	1.8	\$1,315.00	\$20.23

**Combined Forest Fire Record  
For Fiscal Years 1945 and 1946  
All Agencies Reporting**

Year	Town	Railroad	White Mountain National Forest	Total
	<i>Number of Fires</i>			
1945	319	77	4	400
1946	402	65	1	468
Total	721	142	5	868
	<i>Area Burned (acres)</i>			
1945	1,116	201	0	1,317
1946	2,989	118	0	3,107
Total	4,105	319	0	4,424
	<i>Damage</i>			
1945	\$ 4,799.00	\$ 745.00	\$0.00	\$ 5,544.00
1946	\$106,517.00	\$1,315.00	\$2.00	\$107,834.00
Total	\$111,316.00	\$2,060.00	\$2.00	\$113,378.00

**Special Wartime Forest Fire Control Projects**

This federal program inaugurated under provisions of the National Defense Act during 1942 came to an end on June 30, 1945. In five special districts increased fire protective efforts were made in view of the importance of the areas as producers of forest products or as transportation, power, water and mining centers. Following the discontinuation of this Federal assistance and with other funds provided by the Clarke-McNary law the work was reorganized.

At the end of 1945 James W. Keenan resigned from office as district chief in Coos County after 15 years of splendid service and Emmett R. Buckley, Berlin, who had assisted Mr. Keenan as special project director during the war period, was given the status of district chief to fill the vacancy. This was also true of Harold B. Chase, Lancaster, another special project director who had assisted Mr. Keenan in the western part of the same county and became district chief of that area. Messrs. James Q. Ricard and Robert W. Smith who had been special project directors in the central and southern parts of the State became district fire assistants in the fire districts supervised by district chiefs Richardson, King and Boomer. The fifth project director, Richard B. Diehl, has been assigned as fire control staff assistant to the Department's fire prevention work as well as assistant in training and other fire control planning activities.



### **Civilian Defense**

At the height of the war emergency civilian defense problems were of the greatest importance and involved cooperation with many other protective agencies. Elaborate plans made for forest fire control in the event of widespread fires resulting from air raids or other enemy attacks required constant attention. With the cessation of hostilities these special precautionary efforts were abandoned.

### **Forest Fire Prevention**

The Department has joined in the national effort under the auspices of the U. S. Forest Service to prevent forest fires by the distribution of posters, stickers, bookmarks and other forms of publicity material. These had a wide distribution, an effort having been made to place a poster in every schoolroom and to give every pupil a bookmark. In all, about 100,000 pieces of prevention material have been distributed. This was in addition to the regular Departmental fire warning signs placed along roadsides and at the entrances to woodlands by the town wardens and deputies.

In the fall of 1944 an exhibit of fire tools and prevention material was shown during a total of 13 days at four fairs and in 1945 a much larger exhibit was shown at six fairs for a total of 17 days. In connection with Fire Prevention Week, full window displays were prepared in four cities and many smaller displays were circulated in the towns.

Timely warnings through the newspapers during extremely dry periods undoubtedly reduced the number of fires. A special notice was sent to sawmill operators asking their cooperation and care on the part of crews during one of the most dangerous periods involved. Addresses and motion picture shows were given at many schools and to various organizations throughout the State.

District chiefs have urged their wardens to restrict the effective time limit of fire permits in line with the department policy of issuing these permits only when wet conditions prevail. The checking of incinerators and the prosecution of violators have done much to prevent fires.

### **Forest Fire Tools to Towns**

For many years, various forms of hand pumps and other equipment have been stocked by the Department for resale to towns on a 50-50 basis. Tools made to adequate specifications were thus obtained and considerable savings effected. During this war period there was somewhat less activity than usual in this phase of fire control, due in a measure to favorable fire seasons and a consequently lessened demand for tool replacements or additions. On the whole we were able to fill from stock orders received from the towns.

*Forest Fire Radio.*



#### Radio Communication

In the spring of 1941, following a period during which a small quantity of U. S. Forest Service portable radio apparatus had been available for fire control in cooperation with the New England Forest Emergency (hurricane) Project, this department decided to develop facilities of its own and an agreement was reached with the National Youth Administration for the construction of several units. Meanwhile, we procured a small number of ready-made units and worked in cooperation with several municipalities whose fire departments wished to form an emergency fire control radio communication network.

The advent of the war effectively prevented the procurement of additional equipment in appreciable quantities and we have since had to proceed slowly with further development, because of current Federal allocations. This study has been under way since the fall of 1944 and final decisions as to allocations of frequencies have not yet been made. Another obstacle has been the necessity of considering the implications of a relatively newer form of broadcasting—frequency modulation—as they affect development plans. We are firmly committed to the establishment of a statewide radio communication system, however, and determined to progress in that direction as rapidly as possible.

At the present time, in addition to equipment owned by the department, the municipalities of Manchester, Wolfeboro, Concord, Franklin, Loudon and Boscawen are “on the air” in the New Hampshire fire network. Others having definite plans to do so include Hampton and Nashua. There is no doubt that when and as equipment becomes more readily procurable, many more communities will arrange to avail themselves of this important fire fighting facility.

Shortly after the close of this biennium, Leroy P. Mansfield, up to then chief of the Wolfeboro Fire Department and forest fire warden of that community for many years, was engaged by our Department to supervise the development of this radio communication project and to perform such other staff fire duties as might be assigned to him.

### Training of Fire Fighting Crews and Supervisory Personnel

Due to the limitations in travel and the employment of many wardens and deputies in wartime industries, all of the training meetings in the southern fire districts were held in the evening and generally were assemblies of the personnel of from five to eight towns having common fire and mutual aid problems. In the northern districts some day meetings were held, somewhat similar in arrangement to those held in previous years.

These meetings were devoted to the development of local fire plans, the taking of tool and equipment inventories, the discussion and definition of local jurisdictional problems and consideration of previous experiences which might serve to improve the service in the future. In towns where new wardens had been appointed, meetings were held to instruct them in routine procedure and organizational details. The proper use and maintenance of tools and equipment was an important element of all programs.

In the spring of 1946, in view of the unprecedentedly large and numerous slash areas throughout the State, a new form of training program was developed emphasizing the control of fires in such areas. Fire fighting equipment of all available types which, in addition to the conventional power and hand water pumps, hand tools, etc., included fog nozzles, "burning-out" torches, portable field telephones and two-way radio units, was demonstrated under conditions arranged to represent as nearly as might be actual slash fire fighting. Day meetings were held in the outdoors and actual fires were kindled in selected slash areas where both the slash and water were available. Equipment was displayed and the men in attendance were urged to "try it themselves." During dry weather town wardens and their assistants were in communication with their home communities through the availability of field telephone service between the outdoor demonstration area and a selected local long-distance telephone headquarters. The radios were tested under field conditions. The actual kindling, control and final extinguishment of slash fires with various nozzles and attachments proved to be highly instructive and the men gained much confidence in their future ability to handle fires of this general character. Other demonstrations were conducted to illustrate methods of controlling fires without the use of water but by trenching and "burning-out." The noon-day meals were prepared and served by a department crew, using field kitchen equipment available for use when large fires burn during protracted periods of time. A discussion period wound up the day and included a review of the various demonstrations witnessed earlier at the meetings.

In some districts where men could not attend day sessions, evening meetings shortened the time available for outdoor demonstrations but gave more time for discussion of local fire problems. It is felt that these meetings were widely approved by the men and that they will provide a basis for future training plans.

## Lookout Stations

During the biennium some difficulty was experienced in the manning of a few stations, as shown in the accompanying table, but there were no other significant departures from established practices. Some changes in physical equipment were made when the installation on Sam's Hill was dismantled, a new cabin and garage were constructed for Uncanoonuc Mountain and a new garage and fence were constructed at Warner Hill. A number of Osborne fire-finders was procured to complete the installation of these devices at all stations.

The following table gives the record of smokes discovered, fires reported by each station and the number of visitors registered. It will be noted that there was a great increase in the number of 1946 visitors over 1945, a fact of some consequence in view of the educational value which the stations possess.

## Fire Lookout Station Statistics

Name of Station	Number of Smokes Discovered		Number of Fires Reported		Number of Visitors Registered	
	1945	1946	1945	1946	1945	1946
Bear Hill	0 (1)	0 (3)	0 (1)	0 (3)	21 (1)	0 (3)
Belknap	85	190	34	60	1,287	1,404
Blue Job	24	66	7	34	505	585
Cardigan	31	42	30	39	1,731	2,758
Craney Hill	149	203	20	31	279	285
Crotched	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)
Croydon	20	18	12	12	40	5
Deer	0	0	0	0	17	62
Federal Hill	54	62	46	53	560	781
Great Hill	8	21	2	4	113	251
Green	8	32	6	15	664	811
Hyland Hill	57	50	32	43	257	300
Jeremy Hill	65	111	24	31	466	662
Kearsarge	116	136	45	77	3,582	6,706
Magalloway	0	3	0	0	53	37
Milan Hill	2	13	0	12	334 (4)	522
Miller Park	59	54	10	11	4,601	4,702
Monadnock	30	0 (3)	25	0 (3)	5,392	7,465 (3) (4)
Oak Hill	72	90	29	31	291	333
Pawtuckaway	119	137	40	45	1,793	3,099
Pitcher	7	8	4	3	501	776
Prospect	15	106	0	0	695	4,561
Red Hill	70	212	28	39	903	1,199
Rock Rimmon	238	292	36	42	716	826
Sam's Hill	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)
Signal	8	19	8	19	27	17
Smarts Mt.	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)
Stratham Hill	69	111	19	36	1,748	1,632
Sugar Loaf	1 (2)	0	0 (2)	0	0 (2)	24
Uncanoonuc	84	153	32	19	243	1,189
Warner Hill	136	205	50	96	130	291
Total	1,527	2,334	539	752	26,949	41,283

(1) Operated June 4-July 7, 1945

(2) Operated September 12-October 10, 1945

(3) Not Operated

(4) Estimated

**Sawmill Operations**

The number of sawmills registered during the years 1945-1946 has exceeded all previous totals, the almost frenzied demand for lumber and the easing of the manpower and equipment situations naturally combining to bring this about. Only a brief study of the following tabulation is needed to indicate the resulting degree of increase in fire danger. A total of 1,247 permits were issued for as many separate mill installations and each one represents one or more woodlots on which slash is now a fire factor. The fact that fires caused in connection with these logging and milling operations were comparatively few is a tribute to the operators and their crews, whose cooperation with our district chiefs and assistants in carrying out safety measures has been highly helpful.

**Tabulation Showing Registration of Sawmills**

<i>Year</i>	<i>Number Mills Registered</i>			<i>Number of Permits</i>		
	<i>Total</i>	<i>Steam</i>	<i>Gas &amp; Others</i>	<i>Total</i>	<i>Steam</i>	<i>Gas &amp; Others</i>
1925*	163	116	47	244	163	81
1926	240	171	69	432	267	165
1927	254	177	77	459	265	194
1928	249	164	85	443	255	188
1929	248	145	103	440	207	233
1930	202	111	91	310	118	192
1931	149	77	72	273	82	191
1932	125	51	74	175	47	128
1933	141	69	72	298	106	192
1934	174	75	99	343	95	248
1935	143	60	83	276	68	208
1936	167	66	101	323	80	243
1937	196	69	127	387	83	304
1938	207	74	133	361	88	273
1939	306	88	218	563	103	460
1940	263	72	191	446	74	372
1941	279	54	225	555	63	492
1942	293	70	223	757	101	656
1943	260	56	204	516	44	472
1944	263	44	219	535	26	509
1945	281	37	244	505	28	477
1946	405	34	371	742	21	721
22-year average	228	85	142	426	108	318

\* Law in effect from July 1, 1925.

## WHITE PINE BLISTER RUST CONTROL

1945-1946

**T**HE LOGGING, manufacturing and processing of white pine in New Hampshire, ever since colonial days, has constituted one of the chief industries of this state. Whether located in the larger centers of population, or in the more rural sections, saw mills and wood-working plants have continuously contributed *in no small measure* to local revenues, to the general prosperity of the region and to the State as a whole.

Broadly speaking, the commercial range of white pine extends from the Massachusetts border across the breadth of New Hampshire to the White Mountains. It persists northward along the many valleys, seldom being found in commercial quantities above 1,200 feet elevation. According to present day estimates, believed to be conservative, white pine covers an area equal to about 30 percent of the state's forest area. Even after some 300 years of intensive exploitation, white pine is still the most important and valuable forest tree, for it is from this 30 percent of the state's forest area that over 77 percent of the annual lumber cut is obtained.

That white pine has been able to survive and contribute so long to the economic welfare of New Hampshire is due in no small measure to certain natural characteristics. It is a prolific seeder and repeatedly demonstrates an ability to thrive on a variety of soils, even on lands not suited for general agriculture. There is no other softwood in this north-eastern region which grows so rapidly or adds so much to the yearly volume per acre. Irrespective of the in-roads made during recent years upon the merchantable white pine areas, the ever-increasing amount of natural seeding is most encouraging. This seeding indicates that white pine will continue to hold its own as an important lumber producer if given adequate protection and reasonably good management.

Continued control of the white pine blister rust disease is one of the most important protective measures in the program of better forest management. Due to disturbances of the soil brought about by logging regrowth of wild currant and gooseberry bushes often occurs. It is, therefore, important that white pine areas, especially the younger stands, be reexamined five to eight years after the first working in order that these new bushes, which carry the blister rust disease, be located and their destruction effected.

Due to the interest of the Federal Government in white pine as a national asset it has given generous assistance over a considerable period to those states concerned in blister rust control. However, this past liberal financial cooperation is not likely to continue unless the white pine states exhibit equal interest in the future of this tree. Such interest must take the form of more adequate appropriations for the protection of white pine from the blister rust disease.

**Control in Cooperation with Towns—1945**

Returns made to the State Forester by 49 towns indicated appropriations totaling \$14,075. This is in marked contrast to the previous year of the war when only \$4,915 was raised by 20 towns. Prior to the opening of the control season, which comes about May first, inquiries were directed to officials of cooperating and other towns in order to determine prevailing local wage rates for unskilled labor. Returns from 65 towns revealed that in 13 the rate ranged from 40c to 55c per hour; 31 had established a rate of 65 cents, and in the remaining 21, the unskilled rate varied from 66c to \$1.00 an hour. Since war industries had absorbed all available labor, considerable difficulty was experienced in many towns in obtaining sufficient men to make up a standard crew. In others there was a complete lack of labor suitable for this work. As was the policy throughout previous war years, in 1945 every effort was made to see that blister rust control employment did not interfere with farm needs. As a result of the labor shortage, considerable thought was given the plan of setting up "travelling crews" and moving them from town to town. However, due in part to food rationing and lack of local boarding facilities, this proposition had to be abandoned.

Owing to the labor situation, control measures were conducted in only 26 of the 49 cooperating towns. The results of this work will be found in the tabulation entitled "Biennial Summary of Control Work."

**Federal Cooperation—1945**

Since 1942 states engaged in white pine blister rust control, in cooperation with the Federal Government, have received yearly allocations for actual control work upon public and private forest areas. Due to the labor shortage it was not possible to utilize the entire New Hampshire allotment but from June 1 to September 30, Federal funds in the amount of \$12,293 were expended in 32 towns. This permitted the protection of a greater area of white pine without any additional cost to these towns, or the State.

**State Blister Rust Law Applied**

The Forestry and Recreation Commission is charged by law with the responsibility for prosecuting control of the white pine blister rust disease. In the past this work has been conducted mainly by cooperation between the state, towns, cities and individual pine owners. In addition the Federal Government has contributed generously—particularly through the depression and war years—thus saving both state and town funds. As a result there has been a most excellent record of accomplishments, and in a majority of towns the pine areas have been initially protected.

There are towns, however, which have not recognized the need of controlling this disease or appreciated the substantial assistance given from federal and state sources. As a consequence the initial control program is yet to be completed. In order that such areas in these towns be

given initial protection from the rust, authority to apply Section 9 of Chapter 238 of the revised law was requested and granted by the Governor and Council in 16 towns. Blister rust control measures in these towns were supervised by agents of the State Forester, and expenditures in each did not exceed the legal limitation of \$400.

#### Control in Cooperation with Towns—1946

Appropriations by New Hampshire towns for blister rust control in 1946 exceeded those of any year since 1931, a total of 60 towns voting \$17,800. Of the total number of towns about 50 percent raised \$400 each. Irrespective of the termination of World War II, which released millions from the armed forces, the labor situation was fully as acute as in 1945. Although wage rates for both skilled and unskilled labor had been increased somewhat over those of the previous year, it was impos-



*Blister rust crew eradicating currant and gooseberry bushes.  
This prevents infection of pine.*

sible to compete with wages offered by private industry. Moreover, the period of employment—about five months—was too short to attract many men. Nonpayment on rainy days also seriously interfered with the effort to obtain the required field force. In many towns control measures had to be deferred until the latter part of June when high school pupils became available. This younger labor required more intensive training and closer supervision but on the whole, to their credit, performed excellent service. Due to the limited ownership of automobiles most of the transportation was carried on by government-owned trucks. A summary of the town cooperative control work is included in the tables given at the conclusion of this report.



**Federal Cooperation—1946**

The labor situation affected materially the expenditure of federal funds allocated to this State during 1946. However, improvement developed in some sections so that from time to time local crews were placed on federal funds for limited periods. As a result about \$41,601 was contributed by the Federal Government for control work in 71 towns, thus giving protection to a greater pine acreage without additional cost to the towns.

**Pine and Control Area Mapping—1945-1946**

Since 1932 there has been in use throughout this State a system of mapping and scouting which might be termed "mapping for preliminary eradication." Briefly, this system has for its objective (1) the location of white pine areas; (2) the elimination of crew work wherever possible with resultant lower costs; (3) excluding from control work areas where white pine is absent or insufficient to warrant cost of control and (4) the production of a map which would serve as a guide when a re-examination and subsequent re-working of the area might prove necessary.

For the most part mapping of white pine and control areas has been conducted during the fall, winter and early spring months by a small force of men especially trained in this technique. While some state and town funds have been available for this program, it has been financed for the most part by federal funds. With the aid of a small box compass to determine bearings of lines, etc. and by pacing as a means of measurement, maps of surprising accuracy have been obtained at a low cost per acre. While this program of mapping was designed solely for use in white pine blister rust control, the details recorded have been found to be of great value in the preparation of town property maps and for other public economic studies. By the end of 1944 mapping had been conducted, although not completed in every case, in about 159 townships; the areas surveyed totalled 1,494,358 acres. In addition, 278,946 acres were eliminated from mapping and control due to insufficient pine.

During the mapping seasons of 1945 and 1946, from eight to twelve men were employed for varying periods on these surveys. Funds for this purpose were made available in part from state but principally from federal sources. For the two periods combined, 63,752 acres were detail-mapped for the first time and 13,043 acres re-mapped. The surveying of the latter acreage was necessary owing to the original mapping having been more in the nature of sketches and on a different scale. During the past few years considerable research has been conducted in order to determine the extent to which aerial photographs can be used as an aid to forest mapping in the field of white pine blister rust control. It is believed that aerial photographs offer a substantial assistance in detailed forest mapping.

## BIENNIAL SUMMARY—BLISTER RUST CONTROL

Biennial Summary—Blister Rust Control  
Town, State and Federal  
1945 and 1946

<i>All</i>	<i>Area Covered</i>	<i>First Working</i>		<i>Second Working</i>	
		<i>Ribes</i>	<i>Ribes</i>	<i>Area</i>	<i>Ribes</i>
<i>Programs</i>	<i>Acres</i>	<i>Destroyed</i>	<i>Destroyed</i>	<i>Covered</i>	<i>Destroyed</i>
	<i>Acres</i>	<i>Number</i>		<i>Acres</i>	<i>Number</i>
1945	10,664	135,354		27,580	190,260
1946	23,551	352,308		57,785	353,207
Totals	34,215	487,662		85,365	543,467

*Note:* Average number of currant and gooseberry bushes found in first working 14.25; in the second working an average of only 3.3 per acre.

## To Summarize:

1. White pine is New Hampshire's most important softwood.
2. Merchantable areas have been greatly depleted through excessive and unwise cutting.
3. This species is far from extinction as is evidenced by thousands of acres of young vigorous saplings.
4. Adequate supplies of white pine lumber and products are still assured if this tree is given adequate protection and proper forest management. These young pine stands are particularly susceptible to attack from the rust.
5. Control of the white pine blister rust disease constitutes one of the most important phases of good management.
6. The state and towns should make larger appropriations than formerly since the Federal Government cannot be expected to continue its support on the same generous scale as in the past.

## COUNTY FORESTRY PROGRAM

### FOREST MANAGEMENT AND MARKETING ASSISTANCE

**W**HETHER THE forests in New Hampshire are well managed for use now and in the future, or are liquidated to meet existing requirements, depends upon the combined thinking of those who own the forest lands and the wood-using industries, and others concerned with the resources of forest lands. Already there is alarm over the loss of wood-using industries because of the depletion of our forest resources. Understanding of the forest problem is necessary before the proper course of action can be determined. A well planned educational program is essential in order to develop the proper attitude toward the forest problem.

The State Forestry and Recreation Commission and the University of New Hampshire Extension Service, with the cooperation of the United States Forest Service, are now carrying on an intensive educational program in forestry, with particular reference to demonstrations of forestry practices with the landowners on the ground. They furnish practical and useful information relating to the growing, harvesting and marketing of forest products. The program is carried out in accordance with a revised Memorandum of Understanding between the State Forestry and Recreation Commission and the University of New Hampshire Extension Service, dated November 1, 1945. Seven county foresters are employed, and they are supervised by the Extension Forester. The names and addresses of the county foresters and the territory covered by them are listed as follows:

Belknap-Strafford Counties, Robert F. Bradley, Laconia, Telephone 1341.

Cheshire-Sullivan Counties, William E. Dussault, Keene, Telephone 930.

Carroll County, Theodore F. Breon, Conway, Telephone 168-2.

Coos County, Robert H. K. Phipps, Lancaster, Telephone 445.

Grafton County, William A. Johnson, Woodsville, Telephone 241.

phone 800.

Rockingham County, Roger Sloan, Exeter, Telephone 630.

The county foresters have desk space and stenographic help at the County Extension offices, except in the Merrimack-Hillsborough district, where the forester has desk space at the State Forester's office.

From April 8 to June 30, 1946, a forester worked in Hillsborough County. Funds were not available to continue the additional county

forester. The amounts and the sources of funds that support the county forestry program for the fiscal year 1946-47, are listed as follows:

Federal Norris-Doxey funds .....	\$14,000.00
State .....	6,700.00
Counties: Coos, Cheshire, Carroll, Grafton, Sullivan	3,735.00

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\*\$24,435.00

\* Does not include college and federal contributions for salary, expenses, stenographic assistance for the Extension Forester, nor services in kind contributed by County Extension Services and State Forester's office who furnish desk space and stenographic assistance to the county foresters.

The objective of the County Forestry Program is to assist woodland owners in the best methods of growing and marketing forest products, by marking trees for cutting, by bringing sellers and buyers together in the orderly marketing of forest products, and by obtaining the maximum spread of influence among adults and youth through demonstration meetings on woodlands where forestry is being practiced, and through lectures, forestry talks, motion pictures, radio, press, and posters.

Within the period of twelve months beginning November 1, 1945, the county foresters have influenced 184 woodland owners to follow recommended cutting practices when harvesting forest products. These owners have cut selectively 5122 thousand board feet of timber, 1699 cords of pulpwood and 1391 cords of fuelwood, valued at \$146,982.00 at the roadside. The cuttings cover a total area of 2553 acres. Thus the county foresters have been able to get 184 woodland owners within twelve months to start demonstration areas of good forestry. The county foresters also advised 582 woodland owners concerning the management of their woodlands. They have discussed forest management and marketing problems with over 500 sawmill operators and representatives of wood-using industries.

Each county forester prepared a fall forest market report giving the names and addresses of the buyers of forest products in and adjacent to their respective districts. The kinds, sizes and the terms of purchase of forest products bought by each buyer are given. The costs of lumbering, pulpwood and cordwood operations are listed. Woodland owners find the information in the market reports valuable when they have forest products to sell. Approximately 4,000 of these reports have been mimeographed and given out to woodland owners and millmen.

The county foresters have spread forestry information to many of the people in their districts. They have held demonstration meetings on woodlands where recommended cutting practices have been carried out. Approximately 500 individuals attended the meetings and observed how cooperating woodland owners are already growing timber as a crop. A series of sawmill meetings, arranged by the county foresters, brought the

latest information about the sawing and grading of lumber to over 400 individuals. Over 150 maple syrup producers attended meetings held during the early spring of 1946, and they obtained up-to-date information on the production of quality maple products. Talks and motion pictures on forestry have been given at service clubs, granges, schools, and before other gatherings. The radio and the press have been used to get the idea of forestry before the public. A forestry exhibit covering the subject of forest management was shown at the local fairs last fall. The value of the county forestry program is apparent by the assistance rendered to individual woodland owners.

Twenty per cent of the 184 woodland owners who are now growing timber as a crop, have obtained \$2 to \$6 per thousand more for their stumpage because of the market information given them by the county foresters.

A farmer in the western part of the state asked the county forester to show him how to make a selective cutting. He carried on a small scale operation, utilizing his farm labor during slack periods, and had his logs custom sawn at a nearby mill. He was able to get out sufficient lumber for an addition to his buildings at one-half the cost he would have been required to pay if it had been purchased at the local lumber yard. In addition he sold sufficient lumber to defray the cost of the operation.

Another farmer in the central part of the state was offered \$7.00 per thousand for 300,000 board feet of timber; a total of \$2100.00 for all of the growing timber. He contacted the county forester who helped the farmer mark 190,000 board feet, leaving over 50 percent of the trees for future cutting. The owner sold the marked trees to the highest bidder for a price considerably more than \$7.00 per thousand.

A woodland owner in the southern part of the state was offered \$7.00 per thousand for a stand of pine on a 30 acre lot. The owner called in the county forester, and he helped him mark 180,000 feet, leaving about 60 per cent of the growth standing. The owner sold the marked trees to the highest bidder at \$12.50 per thousand.

In order that an effective and efficient educational program in forestry can be carried on by the State Forestry and Recreation Commission and the University of New Hampshire Extension Service, sufficient funds are needed so that a county forester can be placed in Hillsborough County, thus making two districts of the present Merrimack-Hillsborough district. If the following proposed allotment of funds is made available, starting the fiscal year 1947-48, eight county foresters can be employed, reasonable salary increases granted, and adequate travel expenses and stenographic assistance provided.

Federal Norris-Doxey funds .....	\$14,000
State .....	10,000
* Counties .....	8,000

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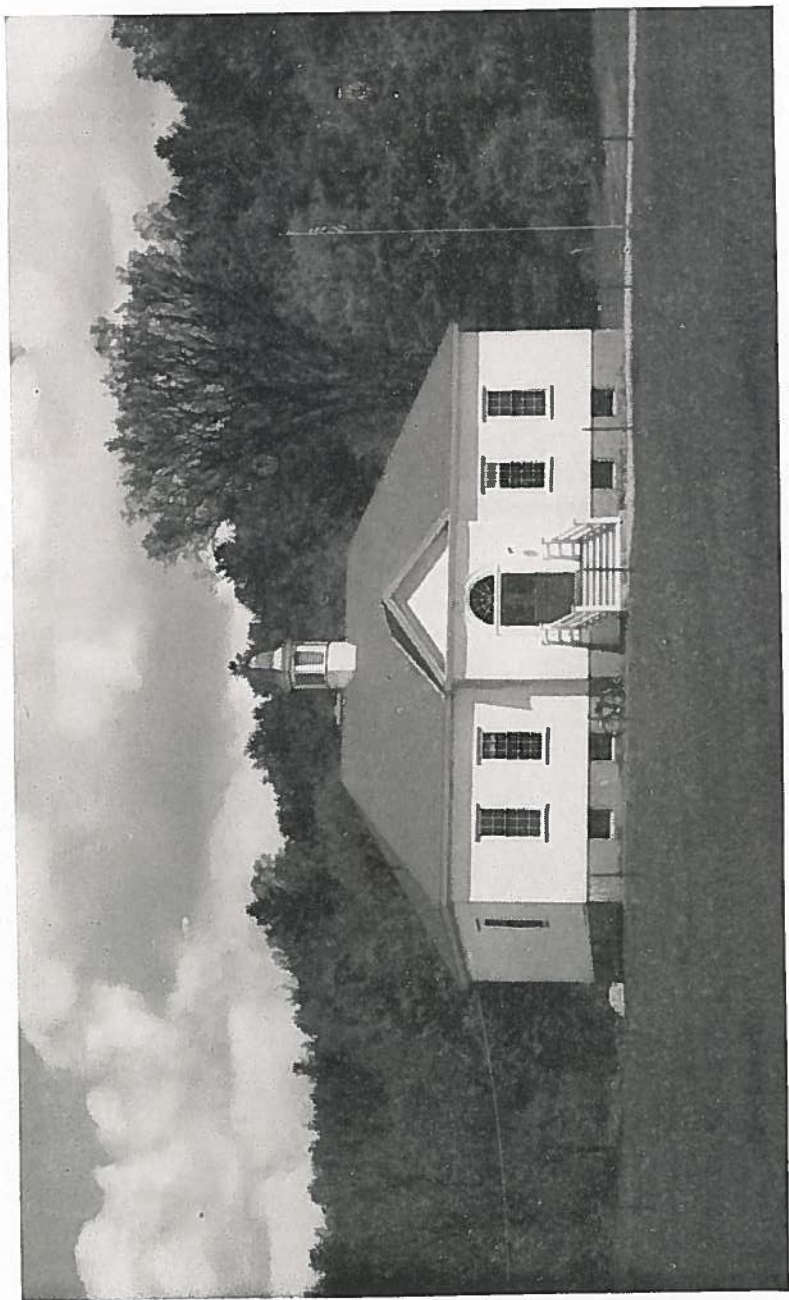
\*\* \$32,000

- \* Each county would need to appropriate \$1,000 for educational work in forestry when it has the full time services of a county forester and \$500.00 when the forester gives one-half of his time in a county.
- \*\* Does not include college and federal contributions for salary, expenses, stenographic service for Extension Forester, nor services in kind contributed by the County Extension Services and State Forester's office who furnish office space and stenographic assistance to the county foresters.

The New Hampshire Intensive Educational Program in Forestry is organized on a sound basis. Through the joint efforts of the University and the State Forestry and Recreation Commission, duplication of effort is avoided. Such a program in forestry, extended to a large number of woodland owners throughout the state, is a practical and efficient way of influencing a majority of forest owners to apply good cutting practices on their forest lands.



*Weeding to release white pine.*



*Many village schools in New Hampshire are at the edge of the forest.*

## EDUCATION AND PUBLIC RELATIONS

**I**N 1945 a new educational program was initiated. It consisted in part of work in the public schools of the state. A staff member, speaking on forest conservation and using visual aids, has, to date, visited ninety-eight schools. Since in some of the larger schools more than one class was instructed, the total number of pupils addressed is approximately three thousand. The emphasis is placed on visits to rural rather than to city schools, as the children in the former are conditioned by their life and background to understand and appreciate the problem of the farm woodlands. They are given simple instructions in modern forest practice, plus the elementary theory of the need for conservation and restoration of these woodlands for the benefit of the state as a whole. The visual material—charts, photographs, colored slides, books and pamphlets are supplied by the department, the Forest Service, the Extension Service and by individuals. At all times this program is given the full cooperation of the State Board of Education and of the teachers in the schools. In two instances mass excursions of high school students to the Fox Experimental Forest resulted from these school talks.

In 1946 the public relations angle of this new program was enlarged to include addressing member clubs of the New Hampshire Federation of Women's Clubs. More than a dozen requested a speaker from the department, and these audiences have shown an intelligent awareness of the gravity of the forest situation in the state.

### Publicity

Written publicity included numerous news items and feature stories concerning department activities sent to the daily and weekly newspapers. A booklet was compiled, entitled, "The Woodland Owner's Seasonal Guide." As the name implies each month is treated separately and practical information and instructions are given. Well illustrated, this is an attractive publication and should prove to be good advertising for forest conservation by arousing the interest of private woodland owners. It can be procured for 25 cents per copy. A third edition of "Trees and Shrubs of New Hampshire" by John H. Foster, State Forester, has been issued with the cooperation of the Society for the Protection of New Hampshire Forests. An eight page bulletin, "Forest Planting", reprinted from the Biennial Report of 1943-44 has been made available; it gives full information for starting and maintaining conifer plantations. A complete list of publications on sale or for distribution at this office has also been issued.

A beginning has been made in radio publicity. One broadcast has been given at the local station on the subject of the education program in the schools. A transcription and phonograph recordings have been made of a fifteen minute informal discussion between the State Forester and a prominent landowner, on the topic, "New Hampshire's Timber Supply".



## FOREST RESEARCH

**E**XPERIMENTAL work carried on by the Research Forester again became centered at the Fox Research Forest in Hillsborough toward the end of the biennium with the resumption of active work under the Fox Trust Fund. During the war almost all investigative work had to be terminated or carried at a maintenance level.

During 1946 two war veteran trainees were employed as field workers at the Fox Forest under an on-the-job training agreement with the Veteran's Administration. In the fall of 1946 an Assistant Research Forester was employed.

### Research Projects

*Thinning:* Over 30 permanent sample plots, established to study the results of thinning in various types and ages of timber in New Hampshire, were remeasured during the spring of 1946. Computation of results is still incomplete. The following are some brief summaries of a few of these plots:

*Plot 78    Oak-Hickory Type    40-50 Yrs.*

Pawtuckaway State Park

Thinned 1933-34	1941	1946		
Number trees per acre	824	764		
Volume (cu. ft.) per acre	1,564	1,849		
Volume (bd. ft.) per acre	4,932	6,892		
Annual growth per acre		57 cu. ft.	3.6	%
		392 bd. ft.	7.9	

*Plot 31    Growth of Natural White Pine    Age 50 Yrs.*

Scribner Fellows State Forest

Ashland, N. H.

	1940	1946	Average annual growth per acre	%
Number trees per acre	460	452		
Basal area, square feet per acre	172	192	4	2.3
Volume per acre cubic feet	6,759	7,579	151	2.2
Volume per acre board feet	22,220	28,068	1,169	5.3

*Weeding:* A number of weeding plots were also measured. In addition considerable areas were weeded on the Fox Forest, both to release natural and planted softwoods, and to improve the composition of young seedlings and sprout hardwoods. Where sprouts had ten or more years growth the labor expense for weeding was found excessive, and it was concluded that it would be better to postpone operations until a marketable product can be removed that will at least in part cover the cost. The machete or weeding tool was found best in sprouts five years or less in age, and a 2½ lb. axe best in older stands.

Plots established after weeding in 1934 in spruce fir stands on the Pillsbury Reservation in Washington were remeasured. Conifers had developed so densely on the heavily weeded plot that a severe thinning was made to aid their development. The lightly weeded plot continues to be dominated by hardwoods as in the unweeded control plot, but the composition, spacing and growth are better on the lightly weeded area. Many conifers have died on both these plots due to crowding and suppression.

Preliminary conclusions to be drawn from this experiment are that weeding to promote growth of spruce and fir and to increase stocking of softwoods should aim at freeing these species from hardwoods as completely as possible. White pine weeded in 1933 has also shown very rapid growth in spite of severe losses from blister rust. Damage from blister rust has been most severe in the weeded plot.

*Girdling:* A remeasurement of areas girdled in 1933-34 on the Pillsbury Reservation in Washington gave striking evidence of the acceleration of growth that takes place in spruce and fir when gradually released from suppression from large hardwoods. Girdling, causing the hardwoods to die slowly over a period of three years, causes no sudden shock or reduction in growth such as occasioned by heavy cutting and sudden exposure of young trees.

*Planting Experiments:* No new planting experiments were tried during the period covered by this report, but some older plots were examined. Norway pine, planted in ploughed furrows in 1927 still maintained superior growth over adjacent trees planted in sod. A start has been made on remeasurement of plots of Norway pine set out at different spacings. Growth of older plantations has been studied by periodic measurement of plots.

*Plot 64 Norway Pine on Contoocook State Forest*

Planted 1921	Weeded 1928, 1934		Thinned 1940, 1946	
	Age 19 yrs. 1940	Age 25 yrs. 1946	Average annual growth	
			per acre	%
Number of trees per acre	548	540		
Basal area (square feet)	57.0	97.6	8.12	14.4
Average d.b.h.in.	4.3	5.6		
Volume per acre cubic feet	596	1,542	189	
Volume per acre board feet	320	2,016	339	

*Source of Seed Experiments:* Plantings of Scotch pine on light sand near the State Forest Nursery showed no significant difference between different origins seven years after planting, because of the extreme variation between individuals in any given lot. There were, however, obvious differences in form, needle color, length and branching habit.

Seed source plantations on the Vincent State Forest, including the International Union of Forest Research Organizations' experiments, were examined and weeded where necessary. Damage by deer had impaired the differences in height growth between different lots of Norway spruce.

There is also conclusive evidence that all or most of the forking and branchiness in scotch pine is due to budding by pine grosbeaks. This makes it difficult to compare trees of different seed sources.

Seeds of European larch from a number of authentic sources were received in 1946, and sown in the nursery. These seeds were distributed by the International Union of Forest Research Organizations supplementing experiments with pine and spruce. European larch has made good growth on the Fox Forest and escaped damage by animals. It is hoped that one or more of these seed lots will show itself to be better suited to New Hampshire.

Black walnuts sown on the Fox Forest in 1936 bore nuts in the fall of 1946. A new shipment of hardy black walnuts was received from Manitoba, through the courtesy of the Provincial Experiment Station.

*Plant Succession after Blowdown:* Final results of this investigation at Fox Forest have not been compiled. During war years, S. H. Spurr of the Harvard Forest continued some observations. In general, pure pine stands that blew down regenerated well to pine, the better the more intensive the salvage of logs and wood. The good seed crop in 1938 was the basis for re-seeding. Apparently there was some hold-over germination in years later than 1939, for the density of pine stocking on some quadrats has increased. Annual plants have now largely given way to hardwood sprouts and seedlings as competitors of pine. Weeding is now necessary in some areas if pine is to become an important component of the new stand. Meanwhile regeneration of Ribes bushes, or germination of dormant Ribes seed, stimulated by the sudden exposure of the soil following the hurricane, has resulted in much new infection by blister rust.

*Miscellaneous:* A number of older projects have been carried in what may be termed maintenance, such as plots of hybrid poplars.

New projects established include experiments to determine the feasibility of regenerating Christmas trees from balsam fir stumps, cut two to three feet high when harvesting the first tree; ski trail cover, to determine the best vegetative cover to prevent soil erosion and reduce maintenance costs. Aerial photographic coverage of the state has been compiled.



*Increased growth following girdling. Section of spruce growing beneath a large beech girdled in 1934. Note wider rings following release.*

### Cooperative Projects

*Tree Pest Leaflets:* The preparation, editing, publication and distribution of 50 short leaflets on the control of forest insects, diseases and other pests was undertaken in 1935 in connection with a committee of the New England Section, Society of American Foresters. Over one quarter million copies were sold, and the assembled leaflets were published in book form. A survey is now being conducted to determine the need for reprintings, revisions and additions.

*Hybrid Chestnut Plantations.* Through the courtesy of Dr. A. H. Graves of the Brooklyn Botanic Garden a few sample chestnuts were set out on the Fox Forest. These were crosses between American and Japanese chestnuts that had demonstrated good resistance to the Chestnut Blight. When re-checked in the spring of 1946 these plantings were found to have suffered badly from deer, frost and other injuries. Additional trees supplied by Dr. Graves were planted in a frost-free site in the early summer of 1946. They are also largely crosses between American and Japanese chestnuts.

Also during this year the U. S. Bureau of Plant Industry approached the Commission regarding an experimental planting of a special Nanking chestnut cross developed by the Bureau. A plot has been established on a site on the Fox Forest, meeting the ecological conditions set up for the experiment, and plantings are scheduled for the spring of 1947.

*On-the-job Training for Veterans:* This program was initiated in January, 1946 at the Fox Forest. Veterans, who were furnished subsistence by the Veteran's Administration, were given opportunity to participate in a wide variety of forestry operations including experimental work such as permanent sample plot establishment and measurement. In addition some instruction was provided and excursions made to the Yale and Harvard forests and to forestry meetings on operations of the New England Forestry Foundation.

### Management of Fox Research Forest

The Fox State Forest in Hillsborough furnishes a center for forest investigations. On the area of 522 acres numerous experimental plots have been located and cultural and logging operations are again continuous after the interruption caused by the war.

During the spring of 1946 the buildings were painted and the office, library and laboratory reopened for use.

New lots acquired during the war years have been surveyed and mapped in connection with on-the-job training.

Maintenance work has included mowing out some 3½ miles of truck road and an equal mileage of trails; repairs and replacements to bridges, gates, leantos and picnic fireplaces.

About twenty acres have been covered in weedings and smaller areas thinned and pruned. Liberation and selection cutting operations have been started in older stands, taking advantage of the good markets for all products.



*Thinning in spruce. Six cords pulpwood per acre have just been removed.*

A small quantity of charcoal was made in the Black Rock type kilns, using thinnings from red and Scotch pine plantations. The charcoal was all utilized by the Recreation Division on state park picnic grounds.

An exhibit of bronzed birch borer damage was displayed at the National Shade Tree Conference in Boston, and material was provided for exhibits at the county fairs. High school groups were conducted on tours of the Fox Forest and forestry museum. Roadside demonstration plots were remeasured and new growth data posted on the signboards.

#### Forest Insects and Diseases

There have been many outbreaks of forest pests and diseases in different parts of the state during the biennium. A special section of the report deals with the white pine blister rust. Renewed efforts must be made to control this menace to our most important timber tree.

*White pine weevil:* This native insect has no doubt caused as great loss as any forest pest by the deformation of otherwise straight timber pines. This degradation of quality results in a financial loss that is very real. The outlook is for less weevil damage in the future as more pine develops under the shelter of hardwood sprouts on cut-over and hurricane lands. It has been the practice on some lands under forest management to carry on direct control by removing and burning the freshly damaged tips during July while the grubs are working in the wood and bark. This decreases the population of insects in a localized area that would otherwise attack another year. Four hundred and fifteen such weevilled tips were removed and burned over about 10 acres on the Fox Forest in 18½ man hours.

*White pine needle blight:* A reddening of pine foliage, short needles and other abnormal foliage has been widely observed. Various aphids that suck the juices of the new shoot are responsible in some cases; in others the condition seems to be related to weather.

*Mound-building ants:* Locally ants cause much damage in plantations and natural young stands, killing hardwoods and conifers alike, in the neighborhood of their mounds by injecting formic acid under the bark.

*Spruce budworm:* Much concern has been caused by the spread of infestation in eastern Canada, and the fear that the insect would reach New Hampshire in destructive numbers. During 1945 a heavy outbreak occurred in the Adirondacks and continued during the spring of 1946. Only scattered individuals of this insect were collected in New Hampshire, all in the far northern towns. To follow the course of this outbreak permanent plots were established in stands of balsam fir at 40 points in the state. These will be examined each year to note the changes in insect population.

*European spruce sawfly*: This insect remains comparatively rare, and appears to be held well in check by larval disease. Some introduced parasites appear to have become established also.

*Bronzed birch borer*: The alarming extent of dieback of birch, believed to be largely due to injury caused by this insect, has occupied the attention of entomologists and pathologists in the Northeast for many years. Sixty-eight per cent of both yellow and paper birch in Maine is reported dead or dying. A similar situation exists in northern New Hampshire and at higher elevations in the White Mountains. The decadence of birch has been in progress for many years, and there are probably many contributing causes, such as openings made by cutting surrounding trees, weakening by hurricane and ice storms, defoliation by leaf-feeding insects and fungus attack. A detailed survey was made along the Connecticut Lakes road and it was estimated that from 30 per cent of the older trees in the southern half to 70 per cent in the northern were dead or dying. The only recommendations for control so far advocated are keeping stands healthy, dense and cutting the birch in advance of or along with other species. Mature birch should be cut and utilized and no defective trees left as breeding places.

*Beech scale and bark disease*: Another enemy of hardwood forests, like the dieback of the birch, has spread from the Maritime Provinces in a southwesterly direction and is now invading New Hampshire. This is the complex of insect and fungus which is gradually killing mature beech in parts of Carroll County. The injury is caused by a *Nectria* fungus that is introduced into the living portion of the bark through minute holes made by a scale insect, or plant louse, while feeding. The scale appears as scattered white cottony flecks on the trunk, especially near the base. The scale in itself apparently does no great harm but the fungus, known only in connection with the scale, kills portions of the bark, ultimately girdling the tree. Many years may elapse between the appearance of the scale and the death of the tree. Vigorous young beech rarely succumb and it is believed that harvesting older beech, when mature, and keeping young stands thinned and in good growing condition are the best methods of control.

A large number of other insects and diseases have been present, some of them extremely prominent, such as spruce gall aphids and webworms, which do little actual damage, except esthetically. Others, such as *nectria*, and *strumella* cankers and wood rots, cause widespread loss that passes unnoticed. In spite of spectacular advances that have been made in direct control of insects by spraying with DDT, maintenance of healthy trees and stands by forest management, working to keep natural conditions, appears the best policy for permanent reduction of insect and disease loss at minimum expense.

## LUMBER CUT 1944 AND 1945

**A**CTIVITY IN sawmilling continued high during the last two war years and production of lumber was only slightly less than during the peak year of 1943 when the highest cut since 1914 was reported. Many factors, however, contributed to a decline in production after 1943. Government regulations of all sorts, labor shortages, deterioration of manufacturing facilities and a feeling of general uncertainty were the major factors depressing lumber production in the calendar years 1944 and 1945. These factors were partially counterbalanced by the effects of the tremendous demand and high prices which created an incentive to produce as much lumber as possible by a more efficient use of available labor and machinery. In comparison the 1945 *field* canvass figure of 305 million bd. ft. indicates a decline of 51 million bd. ft. A downward trend for 1945 was also indicated by the State's 1945 *mail* canvass return of 262 million bd. ft.

Cooperation with the U. S. Bureau of the Census began during the war years and proved of inestimable value in keeping track of lumber production at a time when personnel was limited and travel curtailed. Sample mills were canvassed monthly by the U. S. Forest Service, and contacts thus made have proved valuable in subsequent surveys. The cooperation of the mill owners in supplying production data has continued, and an understanding of the problems involved has enabled the Commission to carry on later canvasses with greater success.

*The 1944 Lumber Cut:* A mail canvass was made by the Forestry and Recreation Commission with, however, unsatisfactory results, since it was impossible to reach the new operators without field visits. Therefore it was decided to accept the estimates of the Bureau of the Census, compiled from mill sampling by the U. S. Forest Service in cooperation with the Civilian Production Administration. The results are given in the same table with the 1945 figures for comparison.

*Collecting Data on the 1945 Cut:* A special effort was made to bring the mailing list up to date in view of the obvious failure of the 1944 mail canvass to reach the producers. All existing mailing lists were screened and submitted to District Fire Chiefs. A list of mills canvassed during the war by the U. S. Forest Service was checked, as were also lists of portable mill registrants and lists of wood-using industries and buyers. Thus over 1,200 card requests were sent out by mail and excellent returns were obtained.

During the winter and spring of 1946, while these returns were being collected, representatives of the Bureau of the Census and U. S. Forest Service met with members of this department and the Vermont and Maine Forest Services regarding a field canvass of mills the Census planned to make. Later a market survey was outlined for the county foresters involving a personal visit to each mill. Recognizing the unfortunate duplication that might arise from several agencies visiting the



same person to obtain the same information, an arrangement was evolved whereby the county foresters acted as unofficial census agents and obtained the data on the 1945 lumber cut. This was entered on forms closely paralleling the official census forms, and the data were then made available to members of the U. S. Forest Service who transferred the figures to confidential census forms. Where mills had already replied to the state mail canvass, forms were filled out with these returns and supplied the county foresters before going into the field. The field agents in these cases attempted to obtain further details on the cut of each individual species as required by the Census.

The field canvass by the county foresters was completed in the summer of 1946, seven to ten months after the close of the calendar year 1945. In many cases mills had changed hands or moved away. The requirements of the Census stipulated that the 1945 cut of a mill be credited to the locality where the mill happened to be at the time of the enumerator's visit. Thus a mill that operated in Maine in 1945 and perhaps part of 1946 was visited by the enumerator at its new setting in 1946 and the 1945 cut credited to New Hampshire. More often the reverse was found to be the case.



*Hundreds of thousands of cords of spruce and hardwood pulpwood are cut in New Hampshire annually.*

The data from both the mail canvass and the field survey of the county foresters have been compiled and are presented here as preliminary figures subject to revision when the final census figures are released. In compilation an effort was made to include only lumber sawed from logs

cut in New Hampshire, no matter where the sawing was done, and to include all timber cut in the state. Due to this objective there will be minor differences in these figures and those to be published by the Census.

A preliminary compilation of the returns from the mail canvass, made before the decision to conduct a field canvass was reached, gave a total of 262,493,951 bd. ft. The field sheets, after completion of the 100% field census of mills, were tabulated by counties and cross-checked for duplication. The state totals are as follows:

### Lumber Cut for Calendar Years 1944 and 1945

Species	1944*	1945	
	M Board Feet	Mail Canvass**	Field Canvass***
Balsam Fir	631	.....	169
Cedar	.....	.....	.....
Hemlock	31,037	21,108	29,671
Pine, White	288,896	202,105	230,853
Pine, Pitch	10	.....	506
Pine, Red	.....	.....	7,613
Spruce	9,145	7,499	9,378
Larch and Other	3	691	492
<b>Total Softwood</b>	<b>329,722</b>	<b>231,403</b>	<b>278,681</b>
Ash	690	.....	220
Aspen	51	.....	4
Basswood	197	.....	70
Beech	2,187	.....	1,478
Birch, Paper	.....	.....	5,811
Birch, Yellow	12,859	.....	2,884
Chestnut	5	.....	.....
Elm	4	.....	76
Hickory	.....	.....	5
Maple	6,101	.....	3,075
Oak	4,458	.....	3,139
Other Hardwood	179	.....	9,472
<b>Total Hardwood</b>	<b>26,787</b>	<b>31,091</b>	<b>26,234</b>
<b>Total All Lumber</b>	<b>356,509</b>	<b>262,494</b>	<b>304,915</b>

\* Facts for Industry: Lumber, Lath and Shingle Production, 1944. Bureau of the Census Series MDG-04, March 22, 1946.

\*\* N. H. Forestry & Recreation Commission

\*\*\*Preliminary figure compiled in the office of the State Forester. Subject to correction when final census figures are published.

The total reported for 1945 is believed to be somewhat low, and it is probable that some mills that operated in 1945 were missed because they had moved from the state before the census was taken. Also it is well known that a considerable quantity of logs and lumber is trucked out of the state. Failure of mills to separate their cut by species resulted in an abnormally high figure for other (unlisted) species of hardwood. This figure should undoubtedly be apportioned to the cut of the common hardwood saw timber species.

*Cut of Timber for Other Purposes than Lumber:* Timber cut for piling, posts, poles, turnery stock, cooperage, excelsior and veneer, while not classed as lumber, must be reported by law just as is sawn lumber. Therefore, all wood-using industries were canvassed by mail and all plants using raw material in the log were visited in the field canvass. The results follow:

### Raw Material Used by Permanent Wood-Using Industries

#### *Products Other Than Lumber*

	1944	1945	
	M Board Feet	Mail Canvass	Field Canvass
Bobbins		1,398	5,727
Dowels		1,255	910
Excelsior		525	1,210
Cooperage		1,200	1,200
Poles		70	87
Posts		285	290
Piling		21	51
Shingles		14	54
Slats		.....	1,250
Staves		1,200	1,200
Veneer		7,971	2,302
Miscellaneous		1,568	3,142
<b>Total</b>	<b>97,241*</b>	<b>15,507</b>	<b>17,423</b>

\*U. S. Forest Service figure



This table is of value in indicating the uses of timber for purposes other than lumber but it is not believed to be a complete inventory.

### Number of Mills Enumerated in Field Survey—1946

#### Number of Saw Mills

County	Operating in 1945					Inactive in 1945						
	S	P	W	S-W	X	Total	S	P	W	S-W	X	Total
Belknap	11	21	2		1	35	5	5				10
Carrroll	12	23	7			42		2				2
Cheshire	18	14	2	11		45	6	8				14
Coos	20	1	7	2		30	4		2			6
Grafton	36	17	6	3		62	7	1				8
Hillsborough	35	20	2			57	14	6				20
Merrimack	19	38	2			59	11	19			1	31
Rockingham	26	37	6	1		70	12	7				19
Strafford	7	21				28	2	2				4
Sullivan	13	14	3	1		31	4	13			1	18
State Total	197	206*	37	18	1	459	65	63*	2		2	132

\*281 Portable Mills registered in 1945.

Key:

S—Stationary Sawmills

P—Portable Sawmills

W—Wood-Using Industries

S-W—Wood-Using Industries with Sawmill

X—Miscellaneous

*Imports and Exports:* No reliable statistics exist for the amount of logs, posts, piling, cordwood and other products exported from the state in unmanufactured form nor for sawn lumber and finished products so exported. It is known, however, that a number of the largest wood-using industries and stationary sawmills import an increasing part of their raw material from other states and foreign countries.

During 1945 about as much pulpwood was imported into the state as was cut locally; in other words the state is only 50% self-sufficient in pulpwood supply. In the veneer and excelsior industries 50% to 90% of the raw materials come from outside New Hampshire. Much of the importation is the result of price differentials, making it cheaper to buy wood outside the state, or is caused by the over-cutting of accessible local supplies.

*Increased Production in 1946:* Early in 1946 milling activity increased rapidly and was further stimulated by the progressive removal of price ceilings and other controls. Monthly production increased 40 to 50 per cent over corresponding reports for 1945. The trend was confirmed by an increase in portable mill registrations, over 400 mills being registered in 1946, an increase of more than 40% over the preceding year.

## FOREST STATISTICS OF NEW HAMPSHIRE

**A** SURVEY of forest resources was carried out in 1923 by the department and the results published in the 1923-24 Biennial Report. No up-to-date statistics on forest resources have been available. During the past year some tables have been compiled, with the sources of data shown. These have been examined and corrected by other state and federal agencies. These statistics are at best approximate, in many cases based on old estimates, but they are believed to represent the best available information at the present time. These statistics have been revised to June 15, 1946. When the Forest Survey, now being carried on in New Hampshire by the U. S. Forest Service, is completed and the figures are released, many of these statistics will need revision.

**Table 1**  
**Forest Area of New Hampshire**

<i>Item</i>	<i>Land Use in 1940</i>		<i>%</i>
1	Developed in cities, towns, highways, etc.	334,983	5.7
2	Agriculture (less farm woodland)	723,199	12.5
3	Barren, permanently treeless bog, rock, sand	45,485	.8
4	Forest	4,671,693	81.0
5 Total land area of New Hampshire		5,775,360	100.0

### SOURCES

Item 1	Developed area: Biennial Report, N. H. Planning and Development Commission, 1936-37, Pages 7 and 64. Planimeted from land use maps, and computed on mileage basis.	81,670 acres
	Highways	18,330 "
	Railroads	234,983 "
	Cities and towns, golf courses, airports, power transmission lines	334,983 "
Item 2	Agricultural land not in forest: U. S. Census of Agriculture, First Series, Table 1, 1940 adjusted by 1935 ratios by U. S. Forest Service. Farm woodland area, 1,086,000 acres subtracted from 1,809,314 acres in farms.	
Item 3	Barren: Biennial Report, N. H. Planning and Development Commission, 1936-37. Planimeted from land use maps.	
Item 4	Forest: Residual figure	
Item 5	Land Area: U. S. 16t Census 1940.	

**Table 2**  
**Forest Area by Counties**

<i>County</i>	<i>Acres</i>	<i>County</i>	<i>Acres</i>
Belknap	203,651	Hillsborough	439,880
Carroll	557,461	Merrimack	460,410
Cheshire	370,498	Rockingham	308,240
Coos	1,054,380	Strafford	184,783
Grafton	915,559	State	4,671,693
		Sullivan	266,741

Source: N. H. Extension Service. Land Use and Forest Information 1946

Table 3  
Forest Regions of New Hampshire

	Acres	%
<i>Softwood Areas:</i>		
Pine (1)	1,346,149	29.2
Spruce and fir (2)	995,101	20.8
Total Softwood	2,341,250	50.0
<i>Hardwood Areas:</i>		
Birch, beech and maple (2)	1,241,541	26.7
Oak (2)	769,617	16.5
Miscellaneous (3)	319,285	6.8
Total Hardwood	2,330,443	50.0
Total all regions	4,671,693	100.0
(1) U. S. Bureau of Entomology & Plant Quarantine, Blister Rust Control Data January 1, 1946		
(2) U. S. Forest Service estimate 1946 adjusted for total forest area.		
(3) Residual figure		

Table 4  
Forest Area Per Capita

1790	30.8	1830	12.4	1870	8.7	1910	8.5
1800	21.9	1840	11.4	1880	8.6	1920	9.2
1810	17.3	1850	9.3	1890	9.4	1930	9.7
1820	14.5	1860	8.6	1900	8.4	1940	9.0

Source: U. S. Census  
Harper, R. M. 1918. Changes in the Forest Area of New England in three centuries.  
Journal of Forestry, 16:442-452

Table 5  
Ownership of Forest Land in New Hampshire \*

	Acres	%
<i>Publicly Owned</i>		
National Forest (1)	649,000	13.8
Other federal forest land (3)	8,000	0.2
State forests (2)	50,308	1.1
State college forest (2)	1,142	0.02
Miscellaneous state-owned forest (1) (Including Water Board 2,800)	4,178	0.1
County forest land (2)	3,925	0.08
Town forests (2)	52,502	1.1
Total Public Forest Land	769,055	16.4
Semi-Public (institutional) forests (2)	11,921	0.3
		16.7
<i>Privately Owned</i>		
Farm woodland (4)	1,086,000	23.2
Industry and other private owners (5)	2,804,717	60.1
Total Private Forest Land	3,890,717	83.3
Total all forest land	4,671,693	100.0

(1) Letter, Supervisor, White Mountain National Forest May 21, 1946, gives 658,257 acres. Area in 1944 was 663,907 acres of which 649,000 was considered forest land.

(2) N. H. Forestry & Recreation Commission records 1945. For later acquisitions see elsewhere in this report.

(3) Northeastern Forest Experiment Station data 1945. This area includes Flood Control Projects, U. S. Army bases, etc.

(4) 16th Census 1940 adjusted by U. S. Forest Service 1946

(5) Residual figure

\* Exclusive of permanently treeless mountain summits above tree line, rock outcrop, bog, tidal marsh, sand beaches, dunes, etc.

Table 6  
Annual Forest Depletion in New Hampshire 1941-1945

1 Year	2 Lumber Cut(1) M. Bd. Ft.	3 Equivalent (8) Cords	4 Pulpwood Cut (2) Cords	5 Fuelwood Cut (3) Cords	6 Miscellaneous M. Bd. Ft.	7 Non-lumber Uses (4) Equivalent Cords (8)	8 Fire Loss (6) Cords	9 Loss from Insects & Wind (7) Cords	10 Total Annual Depletion Cords. (Total of columns 3, 4, 5, 7, 8, 9)
1941	342,407	684,814	332,000	350,000	5,000 (Est)	10,000	74,252	214,900	1,665,966
1942	361,440	722,880	325,000	350,000	5,000 (Est)	10,000	12,206	214,900	1,634,986
1943	392,332	784,664	295,000	315,000	5,075	10,150	4,314	214,900	1,624,028
1944	356,509	713,018	370,000	442,000	97,241 (5)	194,482	9,260	214,900	1,943,660
1945	304,915	609,830	250,000	310,000	17,424	34,848	2,770	214,900	1,421,838
Totals	1,757,603	3,515,206	1,572,000	1,767,000	129,740	259,480	102,282	1,074,500	8,290,468
5-Year Average	351,520	703,041	314,400	353,400	25,948	51,896	20,456	214,900	1,658,093
Annual depletion per acre of forest land—Cords (9)		0.150	0.067	0.076		0.011	0.004	0.046	0.355

(1) U. S. Bureau of Census and U. S. Forest Service official figures 1946

(2) U. S. Forest Service estimates 1946

(3) U. S. Forest Service estimates for Northeastern States May 1, 1945

(4) N. H. Forestry & Recreation Commission Annual Census of cut of poles, posts, piling, veneer, excelsior wood, etc., except where otherwise indicated.

(5) U. S. Forest Service Data, 1946

(6) N. H. Forestry & Recreation Commission Fire record data. (assumed loss 2 cords per acre; area burned x 2)

(7) N. E. Forest Experiment Station data April 30, 1946. Loss from insects and disease 105,500 cords. Wind and other 109,400 cords.

(8) Conversion factor: 2 cords = 1,000 bd. ft.

(9) Total area Forest Land 4,671,693 acres.

## FOREST SURVEY OF NEW HAMPSHIRE

**D**URING 1945 a preliminary revision of data, involving some field studies, was made by the American Forestry Association and the U. S. Forest Service with the advice and assistance of the forestry agencies of the respective states. This work was known as the Forest Reappraisal. The results obtained have been the basis for estimates and broad general reviews of forest resources, values and rates of growth and of timber depletion for the whole country and particularly those regions where the National Forest Survey has not yet been undertaken. The forestry journals have carried many references to this work during the biennium.

The National Forest Survey of the U. S. Forest Service was authorized by Congress some years before the last war to make a nation-wide inventory of the country's forest resources. Before the war groundwork was completed and results of the survey were published for the Pacific Northwest, the Lake States, the Appalachian region and much of the South. The work was suspended during the war years although records of completed regions have been kept up to date.

As a part in the resumption of effort to complete the National Survey, Congress made funds available on July 1st 1946 to extend the work to the northeastern states including New Hampshire. State or local participation is expected to be a part of the survey program. Since the work is based on information supplied from aerial photographs, agencies cooperating with the government have been supplying the photographic prints necessary to conduct the field work.

Survey field work was started in New Hampshire shortly after July 1st, 1946 on the Dartmouth College Grant of some 22,700 acres in the northern part of the state as a result of cooperation with Dartmouth College and the Charles Lathrop Pack Forestry Foundation. As an owner of valuable forest property, Dartmouth College is desirous of handling its forest resources so that the Grant may in the future provide a continuing income to the College from sales of forest products and at the same time provide within the area the most favorable habitat for wild-life, measures for flood control, watershed protection, studies of insect and disease damage and improved forest growth and management. Two crews working on the College Grant completed the field work during October.

In the meantime the Forestry and Recreation Commission agreed to make available to the Survey such aerial photographs taken within recent years as were available and could be purchased from the various governmental agencies, including the Army, Geological Survey and the Soil Conservation Service, in order that the survey work could be ex-



tended to other parts of the state without delay. It is believed that these photographs will enable the survey to be completed for nearly all of central and southern New Hampshire and additional parts of the northern area. There are still some 1,500 square miles of northern New Hampshire where aerial photographs have been made for private agencies and may become available for survey use.

Photographic prints acquired for use of the survey by the Commission will be paid for in part from its federal cooperative allotments. Investigations have revealed that nearly all of the state, including some of the northern part, has been photographed during the past five years and will permit the completion of much of the field work during 1947. All presently available prints are now in the hands of the survey agency and upon completion of the work will be deposited permanently with the Commission. It is expected that field work in southern New Hampshire will be completed by May, 1947 and will be extended into the northern section as rapidly and to the extent that photographic prints become available. There is a possibility that the entire state survey may be finished and preliminary reports made early in 1948.

As for information as to how aerial photographs are used in forest survey work, it may be stated that contact prints are examined under the stereoscope, forest types delineated and sample areas laid out systematically. Estimates of the density and size of standing timber on the plots are made, from which volume is deduced. Subsequently a small percentage of the plots estimated in the photographs are checked in the field. At the same time growth determinations are made of different species and ages growing in different mixtures. Sample trees are bored to determine the past rate of growth. The location of all plots delineated on the aerial photographs and those examined on the ground are recorded to facilitate relocation in the future.

When completed the forest survey should give a highly accurate picture of forest conditions for the state as a whole as of the date the field work was carried out. For example, forest area should be accurate to within 1% and saw timber volume to within 4%. Similar data for counties will be from  $\frac{1}{2}$  to  $\frac{1}{10}$  less accurate, and no attempt will be made to assess area, stand, etc., on a town basis, since the time and expense required for a reasonably accurate survey would be prohibitive.

It should be emphasized that this survey must be kept up to date as far as possible by taking account of all sources of forest depletion and growth as affected by changing proportion of types and age classes. Collection of accurate statistics on the cut of lumber, pulpwood and other products is an essential part of the survey if it is to be of value for more than a few years. Such adjustments prolong the validity of the data but once every 10 or 20 years a complete new inventory should be made.

## DISTRICT FOREST ADVISORY BOARDS

**T**HE SIX district forest advisory boards, established in 1941 under the provision of Chapter 235, Revised Laws, for the purpose of studying forest conditions and making proposals for legislative action, have continued and enlarged their duties and activities during the past biennium.

During the greater part of 1945 the same wartime conditions prevailed as in the two preceding years, and gasoline rationing curtailed the holding of meetings both in the districts and in Concord. Nevertheless the boards were able to fulfill one other of their objectives which is to gather expressions of public opinion from contact with various people in their several districts and to convey these opinions to the Commission for its guidance and assistance.

In 1946 the boards were able to undertake wider activities. They sponsored 28 public Forestry Forums over the state during February and March on the subject of forest conservation in New Hampshire. These meetings were intended to bring out public opinion on all aspects of the problem. No less than three forums were held in each district, at places selected for their favorable location. Members of the boards attended all meetings and, in most cases, presided as chairmen. Subsequently the chairmen and secretaries of the boards met in Concord for the purpose of bringing together information gathered at the forums, as it reflected the opinions expressed. The subjects which appeared to be uppermost in the public mind were education, taxation and regulation.

Therefore at a meeting of members of all the boards in June various recommendations were agreed upon and committees on education, taxation and regulation were authorized to formulate bills for consideration at the next legislative session. The preparation of the bills called for frequent meetings in the districts and in Concord. The boards had strengthened their organization by electing an over-all chairman and secretary to represent them in the work on the bills, their dealings with the Commission and with the public. The purpose of the advisory boards is being fulfilled as evidenced by the contacts they have made and the increase in public thinking on the forest conservation problem.

The passing, in December 1946, of Curtis H. Page of Gilmanton, member since it was established of the Belknap-Carroll Counties Advisory Board, is a great loss to the Commission and to the State.

## REVISION OF LAWS—1945

The Legislature, in the session of 1945, enacted certain laws that relate directly or indirectly to the activities of the Commission. They are given below by title with description of purpose:

### Chapter 184

#### An Act Establishing the Office of Director of Recreation

### RECREATION

According to this Act, "The Director of recreation shall, with the approval of the governor and council, and under the supervision of the commission, execute all matters pertaining to the design, development, administration, operation and maintenance of recreational facilities and services for public use, on all state public areas of recreational significance such as state parks, forests, reservations and historic sites, may recommend for state acquisition lands or the use of lands for recreational purposes and for the protection and preservation of areas of unusual scenic, scientific, historic or other value, may hire such field and office assistants as in the judgment of the commission are necessary for the execution of his duties, and upon terms approved by the commission, may enter into cooperation with departments of the federal government and other public and private agencies for the development or promotion of recreational facilities or services for public use within the state. He shall cooperate with the director of forestry on matters pertaining to the joint recreational and forestry use of state lands, with other state and federal agencies in the development of parkways and scenic routes, in the development of wayside picnic areas, in the promotion of hunting and fishing on public recreational areas, and in the promotion of better understanding of the recreational advantages of the state."

### Chapter 109

#### An Act Establishing Reforestation Week

1. Proclamation. The governor shall annually proclaim May first to seventh, inclusive, as reforestation week and shall request the citizens of the state to observe said anniversary by planting and caring for young forest trees. This act shall take effect May 1, 1945.

### Chapter 37

#### An Act Relative to Civil Actions for Recovery of Expenses Incurred by the State or Towns in Extinguishing Fires

Act is amended to establish the liability of any person causing or kindling a fire without permit, when such permit is required, or by whose negligence or the negligence of his agents the fire is caused, for the payment to the town, or *the state or both*, of the expenses incurred in attending or extinguishing such fire.

**Chapter 142****An Act Relative to Forest Fire Control and the Appointment of Special Deputy Forest Fire Wardens**

These appointees shall have the same powers and duties as the town forest fire wardens but the said powers and duties shall be exercised and performed only in emergencies or in the absence of a regularly appointed forest fire warden or deputy warden.

**Chapter 91****An Act Providing for an Aerial Survey of the State of New Hampshire Forest lands to be included.****Chapter 108****An Act Relative to Rules for the Measurement of Round Timber****Chapter 120****An Act Relative to Authority of Towns and Counties to Operate Recreational Activities****Chapter 153****An Act Relating to the Construction and Operation of Recreational Facilities on Mt. Sunapee in the Town of Newbury**

Supervision and management of operations, when constructed, to be under the Forestry & Recreation Commission.

**Chapter 188****An Act Relating to Highways**

Part 2, section 6 relates to Class III recreational roads. Part 23 relates to trees and roadside growth.

**Chapter 210****An Act making Appropriations for Capital Improvements and Long Term Repairs for the State of New Hampshire Hampton Beach and Franconia Notch capital improvements.****Chapter 211****An Act Making Appropriations for the Expenses of the State of New Hampshire for the Year Ending June 30, 1946****Chapter 212****An Act Making Appropriations for the Expenses of the State of New Hampshire for the Year Ending June 30, 1947  
Forestry and Recreation administration, 1947.**

## STATE APPROPRIATION ITEMS

**T**HIS IS a statement of the department budget appropriations for the year ending June 30, 1945, and for the Forestry Division of the department for the year ending June 30, 1946. Financial statements of the Recreation Division of the department will be found in another section of this report. Included in the following statement are amounts added from the general appropriation for emergency salary increases. Financial statements in detail of all revenue, appropriations and special funds of the department are published in the annual reports of the State Comptroller and State Treasurer.

### Forestry and Recreation Commission

#### July 1, 1944-June 30, 1945

<i>Title</i>	<i>Appropriation</i>	<i>Expenditure</i>	<i>Reserved for bills payable</i>	<i>Balance available</i>
Office of the Forester .....	\$ 20,539.75	\$ 20,320.43	\$ 219.32	\$
Nursery .....	6,847.50	6,805.36	39.55	
Transfer .....	—2.59			
Reforestation .....	2,200.00			
Transfer .....	—167.89	2,032.11		
District Fire Supervision .....	9,013.50			
Transfer .....	—350.00	8,513.50		
Lookout Stations .....	16,000.00	16,000.00		
Warden's Training .....	1,000.00	669.32	330.68	
Forest Fire Bills, to Towns .....	7,500.00	6,346.28	1,153.72	
Prevention of Fires .....	5,318.75			
Transfer .....	—549.31	3,696.15	2,191.71	
White Pine Blister Rust .....	6,308.47			
Transfer .....	—51.80	5,946.45	310.22	
Sawmill Inspection .....	750.00	750.00		
Recreational Development .....	18,185.94			
Income .....	14,067.74			
Transfer .....	3.46	30,430.39		1,786.75
Hampton Beach Bathhouse .....	6,000.00	1,787.72		4,212.28
Federal Emergency Program .....	2,460.07			
Transfer .....	—29	2,459.78		
	\$115,053.30	\$105,757.49	\$4,245.20	\$5,999.03

#### Forestry Division July 1, 1945-June 30, 1946

<i>Title</i>	<i>Appropriation</i>	<i>Expenditure</i>	<i>Reserved for bills payable</i>	<i>Balance available</i>
Office of the Forester .....	\$ 21,567.44	\$	\$	\$
Transfer .....	1,029.67	22,597.11		
Nursery .....	9,413.97	7,876.17	1,537.80	
Reforestation .....	2,710.00			
Transfer .....	—640.45	2,069.55		
District Fire Supervision .....	9,653.23			
Transfer .....	149.64	9,952.87		
Lookout Stations .....	17,092.77			
Transfer .....	1,314.76	18,407.53		
Training Conferences .....	1,000.00	785.27	214.73	
Forest Fire Bills, to Towns .....	7,500.00			
Transfer .....	—1,032.87	4,967.13	1,500.00	
Prevention of Fires .....	4,861.96			
Transfer .....	.22	1,125.97	3,755.77	
White Pine Blister Rust .....	6,887.36	6,856.38	231.33	
Federal Emergency Program .....	6,700.00	6,700.00		
	\$ 88,162.60	\$ 81,337.98	\$7,239.63	\$ 0.00

**Report of**

**Recreation Division**



*View of Mt. Washington From the Motor Road*

*Mt. Prospect State Park*

## RECREATION DIVISION

### DIRECTOR'S INTRODUCTION

**T**RANSITION from a wartime to a peacetime level of operations presented serious problems in both organization and administration of New Hampshire's outdoor recreational establishment.

In the calendar years 1945 and 1946 covered by this report, the Division very early found itself confronted by circumstances for which no proper provision had been made. Budgetary allowances, tailored to the limited needs of wartime functioning, proved inadequate to carry out operations under conditions which changed rapidly after V-Day.

Immediate postwar conditions, which necessarily could not have been anticipated in the biennial budget, were high cost of materials, shortages of both materials and labor, and rising wage levels. These factors, combined with a rapid increase of patronage at all recreation areas and the urgent need to repair buildings and equipment which had been neglected during the war years, taxed the ingenuity and resources of the Division's staff in the maintenance of a going recreation business. One saving factor was the heavy patronage enjoyed at all parks and reservations during the 1946 summer season, which produced an income substantially larger than was expected. This patronage-income increase was particularly notable in the Franconia Notch operation. Added revenue from this source, together with funds allotted in connection with the transfer of several new areas to this Division's jurisdiction, made it possible to operate with reasonable service and such emergency maintenance as was necessary.

Readjustments of many kinds took place in both the organization and the outlook of the Recreation Division during the biennium. The General Court enacted legislation establishing the office of the director of recreation. Anticipating the effective date of this act, the Forestry and Recreation Commission established a recreation division in the department. Lands under the jurisdiction of the Commission were classified as (1) those chiefly developed for public recreation use; (2) those used jointly for recreation and forestry purposes; and (3) those chiefly devoted to the practice of forestry. Administrative responsibility for these areas and their functions, as well as the revenues from them, were distributed between the Recreation Division and the Forestry Division according to their classification. The Recreation Division thus was able to plan an extended program to carry out the intent of the legislative act, as well as its customary summer-time operations.

The war years, which included eight months of the biennium covered by this report, demonstrated the public acceptance of state-operated recreation facilities. Although patronage was greatly reduced at parks



and reservations where service was maintained during the war, it was steady. Many of our patrons were in uniform, servicemen and women seeking relaxation by swimming, hiking, camping or "just loafing" in the out-of-doors during a furlough. They, and the others who made use of the facilities the Division was able to maintain under its minimum plan of wartime operations, justified the expense of providing areas and equipment for public recreational use.

The restrictions and limitations imposed by the war made it impossible to carry out normal maintenance of areas and structures designed for public recreation. Consequently it was necessary, in addition to the administration and operation budget, to request special funds to take care of badly-needed repairs at Hampton Beach Bathhouse. Also taken under consideration during this period was a capital budget program, and a long-range plan of permanent improvements in parks and reservations was prepared. In its final form, this followed generally the plans set forth in "Public Recreation in New Hampshire," published by the Planning and Development Commission in 1943.

On July 1, 1945, the effective date of legislation establishing a recreation director under the Forestry and Recreation Commission, this division had an administrative personnel of three—a director, an accountant-clerk-stenographer, and a clerk-stenographer. Fifteen state parks and reservations already had opened for the summer season. In addition to these, the Recreation Division was assigned to administer, on behalf of the Commission, the Franconia Notch State Reservation.

In consideration of the enlarged functions of the Recreation Division, the Commission approved in principle a plan of organization submitted by the director, defining the services of this Division. In addition to the general administrative branch of the Division, four functioning branches also were established and their duties assigned as follows:

### I. STATE PARK OPERATIONS

This branch will carry on the seasonal maintenance and operation of all recreation areas and facilities except Franconia Notch. It will supervise seasonal personnel, conduct training institutes for employes and attend to seasonal maintenance of grounds, buildings and equipment. It will provide recreation area information, such as folders, maps, posters and pamphlets, and by other means stimulate wider public use of state parks and reservations. It will promote special events, such as sports and pageants, operate the supply depot for area needs, and also record and analyze attendance, costs, income, trends of use, records of personnel and other data.

## II. DESIGN, DEVELOPMENT AND MAINTENANCE

This branch was set up to administer land acquisition studies; maps, surveys and records of lands now held; plan renovation of old areas; plan the development of new areas; prepare construction plans, specifications, estimates and contracts; conduct long-range maintenance of structures and heavy equipment at all areas; cooperate with other branches of the Division and with the Forestry Division.

## III. FRANCONIA NOTCH ADMINISTRATION

Involving, as it does, a large area and several functions under the Commission, this branch will operate as a separate unit under the Notch manager, with headquarters in the Notch. The manager's duties will include engaging and supervising personnel for the seasonal operation and maintenance, operating the Profile Shop and Lafayette Camp Ground, and supervising an office and storeroom to handle payrolls, bills, receipts, records and to receive and distribute merchandise.

## IV. RECREATIONAL SERVICES

This branch will, on request, assist towns and cities by serving as a clearing house for information on physical plans, equipment, personnel, financing, administration, maintenance and operation of facilities pertaining to community recreation. It will cooperate in an advisory capacity with communities on their recreational plans; assist in the establishment of training institutes for recreational personnel, to secure an advantageous exchange of services between state departments, federal agencies and private groups on recreational problems; carry out studies and distribute information.

As early as possible after the establishment of this Division, its limited personnel was expanded to administer newly-assigned functions. Full-time positions were created and filled in the following manner: A forest engineer, previously employed in the department, was engaged as design, development and maintenance engineer in charge of that branch; A trained forester, recently returned from the armed forces, was engaged as assistant director of recreation areas and was placed in charge of the area operations branch; An experienced surveyor-mapper was appointed to handle surveying, topographical and mapping work, to take charge of the map files and to act as chief draftsman in the design, de-

velopment and maintenance branch; Two recently-discharged war veterans were engaged under the G.I. training program in the field of surveying, mapping, designing and drafting; Another veteran with accounting training was engaged as accountant for the Division. Not all the vacancies were filled until the Spring of 1946, but since that time the Division has been functioning efficiently.

Popular demand made it necessary to issue literature for the 1946 season. In cooperation with the Aerial Tramway Commission and the Flume Reservation, a combined booklet on Franconia Notch was financed and distributed. With the assistance of the Planning and Development Commission, another booklet, "Public Recreation Areas," was published. The Division designed and published a folder and map on Bear Brook State Park, in order to stimulate use of the park on week-days and to secure wider interest in the variety of recreational possibilities to be found there.

Reviewing the activities of the biennium, the Division finds that too little attention was paid, perhaps, to this phase of its operations. While these publications reached many vacationists, it was not possible to insure their delivery to any substantial group of New Hampshire residents, leaving them, as in the past, poorly informed as to the facilities easily available for their use close to home. It is felt that an effort should be made to supply more information, through the medium of literature and other publicity, to people who live in this state. These areas belong to the people of New Hampshire and should serve their recreational interests. Furthermore, an increase of intra-state travel would enhance the health of the domestic recreation industry.

RUSSELL B. TOBEY,  
*Director of Recreation*



*Bathhouse and Pool at Mt. Prospect State Park*

## ADMINISTRATIVE REVIEW 1945

**BUDGETS** based on restricted wartime operations were submitted to the General Court for approval.

**A SEPARATE** Recreation Division was established within the department by the Forestry and Recreation Commission.

**FRANCONIA NOTCH** State Reservation was assigned to the Recreation Division for administration.

**FOUR** functioning branches of the Recreation Division were set up by the Commission, on recommendation of the director.

**PEAK LOAD** at Bear Brook Day-Use area ranged from 3,000 to 4,000 per day, including patronage at the bathhouse, beach, family and group picnic areas.

**PATRONAGE** at state parks and reservations jumped immediately after gasoline rationing was lifted, taxing recreation facilities in all areas.

**SUMMER** operations of the Profile Shop and Lafayette Camp Ground were resumed, showing a financial profit. Total sales at the Profile Shop were \$18,304.

**ROLAND PEABODY**, director of the Aerial Tramway, was appointed acting manager of Franconia Notch installations under an agreement by the Division to pay half his salary.

**A SUPPLY DEPOT** to serve all areas was established at Bear Brook Reservation.

**WORK CAMP** was established in the rehabilitated CCC camp in Franconia Notch, and a merchandise storeroom was created.

**THE NAVY** Department abandoned its recreation camp at Bear Brook State Park and transferred its buildings to the state.

**ATTENDANCE** at state parks and reservations was 225,000 during the summer vacation season.

**NET COST** of operating parks and areas was 6.8c per visitor this year.

**HAMPTON BEACH** bathhouse was repainted inside and outside, and the grounds were landscaped.

**WEEKS MANSION** in Mt. Prospect Park was repaired and refurnished, and a new ski slope was constructed.

**INCOME** from operations represented approximately 54% of the division's total expenditures.

**TECHNICAL** personnel was added to the Recreation Division staff.

**SIX** parks and reservations were not operated during the season due to conditions caused by the war.

## ADMINISTRATIVE REVIEW 1946

**A** BOOKLET publicizing the facilities at Franconia Notch was issued in cooperation with the Aerial Tramway Commission and the Flume Reservation.

**"PUBLIC RECREATION AREAS,"** another booklet, was published through the cooperation of the Planning and Development Commission.

**MAP** and folder on Bear Brook State Park were issued by the Recreation Division.

**WORK CAMP** at Franconia Notch made improvements to buildings and grounds at several important installations.

**IMPROVEMENT** projects were carried out in Crawford Notch Reservation, Mt. Prospect State Park and Cannon Mountain ski trails by Franconia Notch work camp.

**OFFICE** and central store-room were established in Franconia Notch.

**LEAGUE** of New Hampshire Arts and Crafts remodelled the abandoned railroad station at Franconia Notch for sales and demonstration of handicrafts. The entrance, parking area and vistas around were improved and landscaped by work parties in time for the 1946 Arts and Crafts Fair.

**PUBLIC** demand made it necessary to offer full-time services at Toll Gate State Park on Mount Kearsarge State Reservation, Warner.

**FULL-FLEDGED** summer programs were conducted at 21 parks and recreation areas for the first time since the war, with 107 seasonal and part-time personnel.

**ATTENDANCE** at parks and reservations increased to 300,000 during the summer season.

**NET COST** of operating parks and recreation areas was 9.8c per visitor.

**POLIOMYELITIS** scare cut into attendance at all areas during August and September.

**INCREASING** patronage at Echo Lake State Park, North Conway, made additional facilities necessary, so considerable improvements were made and the park was operated on a full-time basis for the first time.

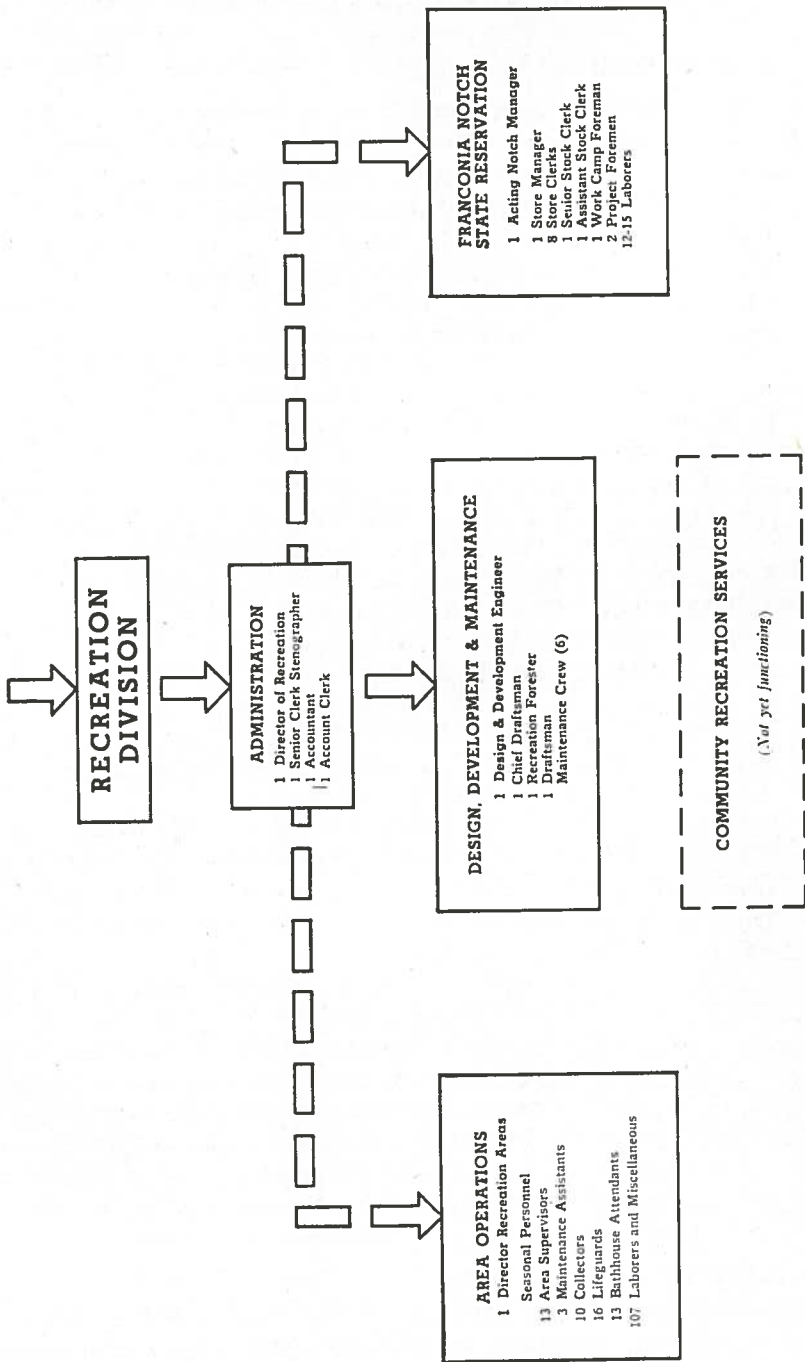
**RED CROSS** National Water Safety Division investigated and approved swimming facilities at all state-operated areas.

**FOUR** tennis courts and five shuffleboard courts were added to the facilities at Hampton Beach Reservation.

**INCREASING** patronage at Echo Lake State Park, North Conway, made additional facilities necessary, so considerable improvements were made and the park was operated on a full-time basis for the first time.

**NET COST** of operating parks and recreation areas was 9.8c per visitor.

**FORESTRY AND RECREATION COMMISSION**  
5 MEMBERS



## AREA OPERATIONS

JOHN B. BLACKWOOD, *Assistant Director of Recreation Areas*

**U**NDER the assignment of facilities made in 1945 by the Forestry and Recreation Commission, the Division operated 21 state parks and reservations, listed as follows:

BEAR BROOK STATE PARK, Allenstown  
BELLAMY STATE PARK, Dover  
CARDIGAN STATE RESERVATION, Orange  
CLOUGH STATE PARK, Weare  
ECHO LAKE STATE PARK, North Conway  
CATHEDRAL LEDGE STATE RESERVATION, North Conway  
ENDICOTT ROCK STATE PARK, Laconia  
FOREST LAKE STATE PARK, Dalton  
HAMPTON BEACH STATE PARK, Hampton  
KEARSARGE STATE RESERVATION  
TOLL GATE STATE PARK, Warner  
WINSLOW SITE STATE PARK, Wilmot  
KINGSTON STATE PARK, Kingston  
MILAN HILL STATE PARK, Milan  
MILLER STATE PARK, Peterborough  
MONADNOCK STATE RESERVATION, Jaffrey  
MOOSE BROOK STATE PARK, Gorham  
MOUNT PROSPECT STATE PARK, Lancaster  
PETERBOROUGH STATE POOL, Peterborough  
WADLEIGH STATE PARK, Sutton  
WELLINGTON STATE PARK, Bristol  
WENTWORTH STATE PARK, Wolfeboro  
WHITE LAKE STATE PARK, Tamworth

These public recreation areas, dispersed throughout the state, provide inhabitants of the state and vacationists with various forms of outdoor play facilities. The areas are designed for such activities as swimming, picnicking, hiking, camping and general outdoor relaxation for the thousands of people who use them annually. The commercial recreation industry, which ranks as one of New Hampshire's most important economic fields, relies heavily upon the state-operated areas to furnish these facilities and interests to its clientele. Besides the indirect benefits returned to the state and local interests through their operation, these areas refund a goodly proportion of their operating costs directly to the state through service charges for their use, and rental of special equipment.

### ADMINISTRATION

During the 1945 and 1946 seasons, the areas were operated by a total of 80 and 107 seasonal personnel, respectively. Under the classification system, personnel was engaged under the following classifications: area supervisors, recreational maintenance assistants, collectors, bathhouse

attendants, lifeguards and part-time help. Wages paid to employes have risen steadily, but higher salaries during the past biennium have been partly offset by higher qualifications for employment and by a new policy of year-round jobs for certain well-trained workers formerly engaged on a seasonal basis. The number and classification of full-time seasonal personnel required to supervise, operate and maintain the areas during the past two seasons are shown in the following table:

## PERSONNEL CHART

	1945		1946	
	<i>Number Employed</i>	<i>Average Monthly Wage</i>	<i>Number Employed</i>	<i>Average Monthly Wage</i>
Area Supervisors	13	\$145.12	16	\$151.21
Maintenance Assistants	3	129.21	3	138.25
Collectors	5	98.33	12	105.82
Lifeguards	10	108.16	15	123.00
Bathhouse Attendants	11	101.96	15	112.14
Casual labor	38	66.62	46	94.18
Totals and Average Monthly Wage	80	\$108.23	107	\$120.76

Near the end of the war with Japan in the summer of 1945, attendance jumped sharply in all areas. This trend continued through the 1946 summer season until mid-August, when a state-wide poliomyelitis scare reduced patronage at some areas. Because of this expanded program, personnel and equipment were under an unusual strain, and funds were stretched to maintain a high level of operating efficiency.

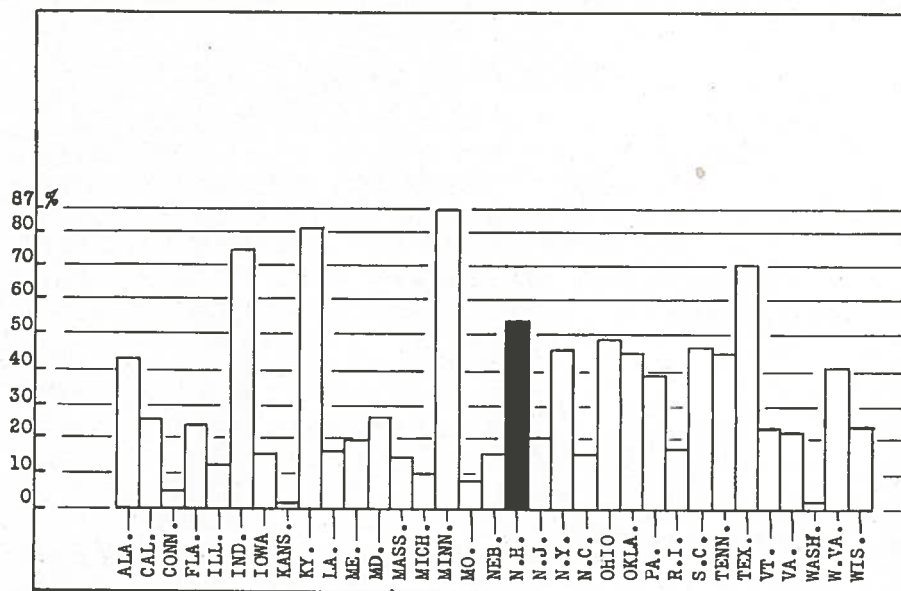
The 1946 season found the Division faced with the problem of serving large numbers of vacationists with facilities which had deteriorated during the war years. Because supplies and labor still were difficult to obtain, many breakdowns and temporary interruptions of operations were experienced during the 1946 season. But due to the ingenuity, interest and resourcefulness of key personnel, these conditions did not adversely affect services to visitors on these areas.

The operating budget for all areas, including the supply depot, was set at \$63,000 in 1946. This budget was stretched to cover additional employees, supplies, equipment, and in many cases much of the maintenance work and replacements needed most urgently. It is estimated that about 225,000 visitors were served during 1945, and 300,000 in



1946. This patronage figure does not include attendance at Crawford Notch and Franconia Notch Reservations, which are assigned to a separate branch of the Division.

The average net cost per visitor was 6.8¢ in 1945 and 9.8¢ in 1946. Income from service charges represented about 54 percent of total expenditures on maintenance and operations. How this compared with the cost of similar services in other states for 1945 is shown below:



*Percent of State Park Income as to Expenses*

## SUPPLY DEPOT

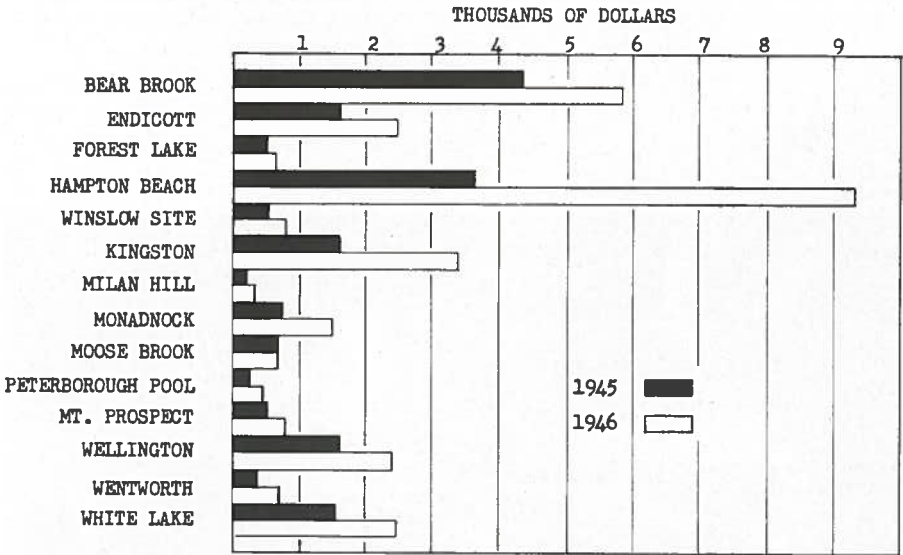
Supplies for sustaining operations at the 21 areas was one of the Division's major problems during the past two years. Scarcities existed in nearly every item for which there was demand, and a restricted wartime budget further aggravated the situation. Prices were inflated and in many cases substitutes were used.

To simplify the procedure for purchasing and distributing supplies for which increasing demand was found in all areas, the supply depot at Bear Brook State Park was reorganized in 1945. Methods were standardized and supplies were stocked in large quantities prior to the 1946 season to take advantage of wholesale prices. State priority privileges were employed to buy surplus goods from the War Assets Administration. In two years the depot has proved its worth in reducing costs of supplies and equipment, and has resulted in more efficient operations by furnishing needed materials promptly.

Plans are now under way to extend and refine the scope of the depot to take advantage of reduced cost of materials and supplies in every way possible.

**AREAS**

During the 1945 season, six areas were not operated by the Division. They were Echo Lake and Cathedral Ledge Park, North Conway; Clough Reservation, East Weare; Toll Gate Park, Warner; Miller Park, Peterborough; Milan Hill Park, Milan; and Wadleigh Park, North Sutton. In 1946, these parks, along with all other state-supervised areas, were operated on a full-time basis. In the latter year, attendance and income returned to something resembling 1941 conditions, when an all-time high in patronage was recorded. Revenues from various parks and reservations appear in the following table:



*Total Income for State Parks*

**BEAR BROOK PARK**

Bear Brook Park in Allenstown, 7,000 acres of woods, fields, streams and ponds, serves the Division as a recreation demonstration area due to its intensive use. During the last two years, attendance at the day-use area—the beach, bathhouse, family picnic area and group picnic area—frequently ran as high as 3,000 and 4,000 persons per day. In 1945, the two organized camps at Bear Hill Pond and Spruce Pond were filled to near-capacity of about 100 campers each during the entire ten weeks of operation. During 1946, attendance at the camps suffered a decline when an organization scheduled to use Bear Hill Pond camp cancelled its reservation due to the polio scare. The reduced summer attendance was partially offset by the increased use of both camps by educational, recreational, scientific and religious organizations during the spring and autumn. One of the best examples of this was on the Columbus Day weekend when the Merrimack Valley Riding and Trail Association scheduled a two-day trail ride at Bear Brook and used Spruce Pond Camp as its headquarters. About 150 people participated in the ride,

for the most part in family groups. Temporary stalls were provided for the horses in the administration group garages, and tentative plans are being made to renew the event twice a year.

The group picnic area, with its large shelter building and undercover cooking facilities, has increased in popularity to the point where reservations during the past season were scheduled a week or more in advance. Many industrial, religious and social groups used the area for outings of up to 600 persons per group.

The family picnic area increased in use to the point where it is deemed unwise to continue using the area without immediate expansion. The need for more tables and fireplaces was evident during both seasons, particularly on weekends and holidays. Even more serious from an administrative standpoint are signs of wear in the area. If this situation is allowed to continue over an extended period, correction will be both expensive and difficult. It is recommended that this area be enlarged both as to size and facilities as soon as possible.



*Picnic Shelter at the Group Picnic Area Bear Brook State Park*

The swimming area and bathhouse continue to increase in their appeal to the public. Because of extensive use, it was necessary to employ two lifeguards on the waterfront for most of the 1945 and 1946 seasons. The lifeguards conducted swimming classes at slack intervals, a service greatly appreciated by the public.

Over-all maintenance at Bear Brook State Park embraced more than 130 buildings, and the water, sewerage and electrical systems. Ten miles of gravel roads and nearly 25 miles of foot trails also were maintained. An organized fire protection crew was maintained, but only one potentially serious fire developed in the area, which was extinguished mainly

through the efforts of this crew. However, the crew assisted in fighting several fires in sections adjacent to the reservation.

Since Bear Brook Park was taken over by the state in 1941, attendance has increased 700%. It is estimated that, if this rate of increasing patronage should continue in the next few years, the detrimental effect of intensive use will cause near-irremedial damage to both the area and facilities. Plans are being drafted with the view to disperse some of this concentrated use over a wider area, through the medium of suggested activities and interests designed to induce patrons to expand their use radius beyond its present limits.

### **ECHO LAKE PARK**

Echo Lake Park, North Conway, was provided with a picnic area and small parking lot in 1945, through part-time maintenance work. Before the summer ended it was evident that the attractiveness and recreational possibilities of the area were appreciated by the public to such an extent that in the 1946 season the Division was obliged to provide the park with full-time supervision and water-safety protection. New tables were added to the picnic area and new fireplaces were erected. A well was driven and pump installed to provide drinking water.

Because Echo Lake has no apparent outlet or inlet, the seasonal bathing load that could be carried without pollution was unknown. During the 1946 season a close check was maintained and samples of water were tested weekly. At the end of the summer, results indicated the lake had accommodated about 10,000 persons and the water still was safe for swimming. Similar tests will be made in future years to ascertain the lake's capacity under varying use and conditions.

Echo Lake Park is undesirable from both an operational and a use viewpoint at present. Its potential use would indicate the need for such minimum facilities as a bathhouse, sanitary facilities, adequate parking lots and a picnic area at least large enough to accommodate optimum loads. Present facilities are both under-developed and inadequate to meet the use load. Improvements in the past two years were of stop-gap nature, made necessary mainly by popular demand and on a wartime budget.

### **TOLL GATE PARK**

Toll Gate Park, located on Mt. Kearsarge Reservation in Warner, is at the foot of a 2.5-mile gravel road running to the top of the mountain, giving access to some of the state's most beautiful scenery. The area never was finished, and the road itself needs considerable improvement before it can be considered safe for heavy use. The potential recreational value of the area is high, but considerable capital improvement will be necessary before its optimum use can be realized.

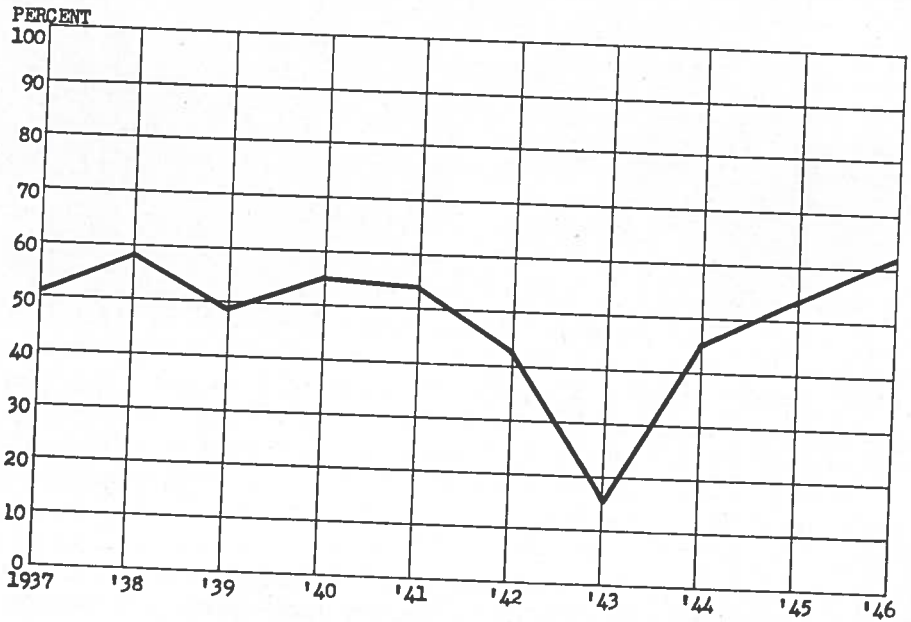
### **MILLER PARK**

Miller Park, located on Pack Monadnock in Peterborough, is another mountain-top area accessible by automobile road. Conditions here are very similar to those at Toll Gate Park.

## WADLEIGH PARK

Wadleigh Park, North Sutton, one of the older areas, has had limited recreational use since the 1938 hurricane stripped it of many of its trees. In 1945 the park was operated on a part-time basis, but in 1946, because of increasing use in and around the water area, it was provided with full-time supervision and water-safety protection. The original facilities leave much to be desired for present operations. Because of design and lack of maintenance during the war, only part of the bathhouse can be used. Much of the hurricane debris has been removed, but before the park can be returned to its full recreational use, a substantial amount of effort must be expended to remove stumps, clear brush and relandscape the area.

Other units in the state park system were operated under the same conditions that existed in prewar years. Full-time personnel provided services to an increasing clientele. Factors which tended to increase operating costs in the Division included breakdowns of the sewage disposal systems at Wellington Park and Bellamy Park, the necessity of hiring transportation and trucking because of inadequate and unreliable trucks owned by the department, breakdowns of water pumps, and repairs necessitated after four years of maintenance work at a minimum level for all buildings and grounds. How income has partly offset the operating costs at state parks in the past nine years is shown in the following chart:



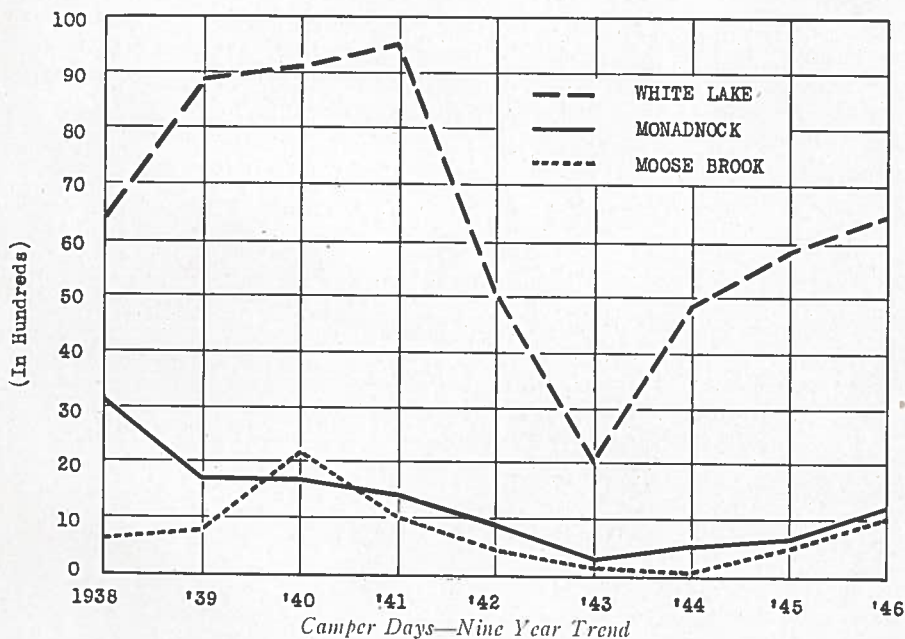
*Percent of Income to Expenses 1937-1946*

## CAMPING

The three major camping areas in the state park system—Moose Brook, Monadnock and White Lake—enjoyed patronage nearly equal to that in the 1941 peak year. Travel restrictions made some inroads on attendance, but an immediate improvement was noted after the war ended. Use of the camping areas is expected to increase, and it probably will be necessary to continually enlarge the areas and expand facilities to adequately and efficiently serve the public.

## LOOKING AHEAD

Studies to determine conditions affecting use of the several state recreational installations are being conducted. In order that New Hampshire may anticipate shifts in public tastes and interests, the Division is making a continuing survey of trends at camping areas. Such charts as the one illustrated here are an aid to the Division in estimating trends and use at state areas, so that plans may be made in advance to supply, maintain and operate the parks in such a way that the public will be efficiently, economically and comfortably served.



Constant efforts are made to secure advise and counsel whenever and wherever it is available. In 1946, at the request of this Division, the National Red Cross Water Safety Division provided the state with one of its representatives, who toured all of the water-front areas with a representative of this Division. Each area was given a thorough examination with regard to its water-front protection, equipment, techniques and personnel. After a week-long investigation, the National Red Cross Water Safety Division reported its approval of procedures being em-

ployed in New Hampshire's parks. Several suggestions for improved practices were made and immediately put into effect.

Late in 1946, a representative of the National Park Service was made available to this Division to tour the various areas and study operational and maintenance procedures, and the individual problems encountered in the various parks. A considerable amount of valuable information was obtained from this tour, and wherever possible, the recommendations were adopted.

*Conway Intervale From Cathedral Ledge State Reservation*



## DESIGN, DEVELOPMENT AND MAINTENANCE

BERNARD M. REEN, *Design Engineer*

**W**ITHIN the scope of funds available, the activity of this branch was limited during the biennium. A brief summary of work follows:

Hampton Beach Park—Exterior and interior walls and metal partitions of the bathhouse were sandblasted and painted. All offices and rooms were redecorated. About 150 shrubs were planted at the rear of the bathhouse. Soda fountain equipment was removed from the second floor of the building, and a modern 38-foot counter was installed on the ground floor. Checking facilities were rearranged completely, allowing freer movement of patrons through the bathhouse. Wooden walks were removed and 5,000 square feet of concrete terrace was built adjacent to the bathhouse. A battery of four tennis courts was installed, two of which were surfaced with a compound of cork and bituminous material, and two surfaced with a patented quick-drying substance, Rubico. Five concrete shuffle-board courts were constructed and equipped. Drinking water was brought into the tennis area by laying 400 feet of pipe from the bathhouse. A grass plot 70 by 350 feet in size was built at the rear of the bathhouse, as part of the long-range beautification program. Certain structural repairs were made not only to the bathhouse, but also to the outflow end of the storm sewer serving the building.

Bear Brook Park—A new play field 100 by 200 feet in size was cleared and graded in the group picnic area, and space for 20 additional cars was provided. Twelve additional picnic sites were constructed and equipped with tables and fireplaces, and children's play facilities were installed at the family picnic area.

*Foundation Planting at*

*Bathhouse Hampton*

*Beach State*

*Park*





Wadleigh Park—Two old sets of bleachers at the baseball field were dismantled and one new set of stands was built as a partial replacement.

Hemenway Reservation—Floor joists and flooring in the barn, which serves as recreation center for the Tamworth Outing Club, were repaired.

Franconia Notch Reservation—A permanent work camp with 20 men under the direction of James W. Keenan was established in the old CCC camp. The camp was rehabilitated in October, 1945, and considerable improvement cutting was done at Lafayette Camp Ground. About 10,000 feet of logs was salvaged for use on the reservation. In April, 1946, work parties started improving the Camp Ground facilities, building a new approach road 20 feet wide into the camp site and doing some landscaping. Many of the old camp locations were eliminated and 40 new sites with fireplaces were built. Twelve additional sites for picnicking were selected and provided with fireplaces and tables. Lafayette Lodge was reroofed completely, stained and caulked. Two toilet buildings in the camping area also were stained and weatherproofed. The approach road to the Arts and Crafts building was graded and gravelled, and about 900 square feet of flagstone terrace was constructed at the building. The Echo Lake tea room was remodelled for use as a Notch office and merchandise store-room, and was equipped for winter occupancy. The most important project was construction of a recreation area on the north shore of Echo lake. The abandoned state highway along the beach front was replaced with a landscaped terrace faced with a boulder retaining wall 425 feet long. Parking areas were built at each end of the beach with a total capacity of 50 cars. A small water control structure, replacing an existing small dam, was built in conformance with standards agreed upon by the Fish and Game department and Water Resources Board. The Division designed and installed new types of naturalistic signs to supplement existing signs in the Notch area. Three of the larger signs were placed on the highways in the approaches to the Notch. Smaller signs were installed at the Basin; Lafayette Camp Ground; Profile Parking Area; the Arts and Crafts Building and at Echo Lake.





*Completed Landscape Project on North Shore of Echo Lake, Franconia Notch State Reservation*

Mount Prospect Park—The great room on the second floor of the mansion was redecorated, and the exterior walls and woodwork were repaired and painted in 1945. An intermediate ski trail 4,000 feet long was completed on the northwest side of the mountain and a 1,000-foot rope tow was installed in 1946, with the assistance of the Mt. Prospect Outing Club. A new winter parking area with space for 40 cars was constructed at the base of the ski slope.

New boundary surveys were made in 12 areas. These included Curtiss Dogwood Reservation, Humphreys Ledge Reservation, Mt. Prospect Park, Echo Lake Park and Madison Boulder Reservation.

Lineal and topographic surveys were conducted on the Echo Lake, Profile and Basin areas of Franconia Notch Reservation; Mt. Prospect Park; Hampton Beach Park; White Lake Park; and Echo Lake Park.

#### **COMMUNITY SERVICES**

Due to lack of funds and non-availability of trained personnel, this branch has not been operative during the biennium. Some services of this type were performed, upon urgent request, by other branches of the Division.

#### **FRANCONIA NOTCH RESERVATION**

The reservation, comprising some 6,000 acres, has an unusual concentration of scenic features, contains several public recreation developments, and involves several agencies with diverse interests. The Division cooperates with several agencies in coordinating the administration and development of the Notch. The long-range advantages to be gained by the state through mutual efforts of public and private interests are not being overlooked. Every action to exploit the commercial possibilities of the Notch area is taken with strict attention to the protection and preservation of its scenic attractions. No commercial development, however attractive from a monetary viewpoint, is allowed if its operation would be deleterious to the natural beauty of the area.

Such agencies as the Society for the Protection of New Hampshire Forests, the State Highway Department, Planning and Development Commission, Aerial Tramway Commission, Fish and Game Department, Appalachian Mountain Club, League of New Hampshire Arts and Crafts, Water Resources Board, Department of Agriculture, National Park Service, private utilities and interested citizens' groups are involved in constant discussions with the Division to protect the recreational values inherent in the Notch.

The Division's functions in the Notch were hindered by wartime conditions under which normal maintenance of buildings and normal operation of facilities could not be conducted. The Commission instructed in June, 1945, that operation of the Profile Shop and Lafayette Camp Ground were to be resumed under the Recreation Division. The Forestry and Recreation Commission arranged with the Aerial Tramway Commission to engage the part-time services of Roland Peabody, managing director of the tramway, to operate the Profile Shop and Lafayette Camp Ground. Through the cooperation of C. T. Bodwell, director of the Flume Reservation, it was arranged to rent equipment such as cash registers, and for the purchase of surplus Flume merchandise for resale in the Profile Shop. A store manager and sales personnel were engaged to operate the shop for that season. The operation had limited sales due to travel restrictions and merchandise shortages. However, it was financially satisfactory and provided much valuable experience. Due to gasoline rationing, Lafayette Camp Ground had limited patronage also in 1945.

In the fall of 1945, the Commission indicated its desire to start the capital improvement program provided in the capital budget. James Keenan, a camp superintendent with years of valuable experience, was engaged to organize work crews and rehabilitate a set of buildings formerly used by the CCC. Such limited equipment as was available was assigned to the work camp. However, rehabilitation of the camp, which involved relaying a water system and remodeling the buildings, was more extensive than had been anticipated and lack of tools and building materials left little time for other improvement projects in the Notch before winter forced a shutdown. Plans for the 1946 season, based on experience gained during the previous year, were developed early in the spring. Again the Commission arranged for the services of Mr. Peabody as acting Notch manager on the agreement to reimburse the Tramway Commission for half of his salary. It was found desirable to establish an office and storeroom in the Notch. This office took care of fiscal matters, as well as receiving, inventorying and storing merchandise in anticipation of the 1946 season.

The acting Notch manager proceeded to engage personnel for the office, Profile Shop and Lafayette Camp Ground. These operations were more successful, reflecting the lessening of wartime restrictions. The work camp was again directed by Mr. Keenan and carried out projects



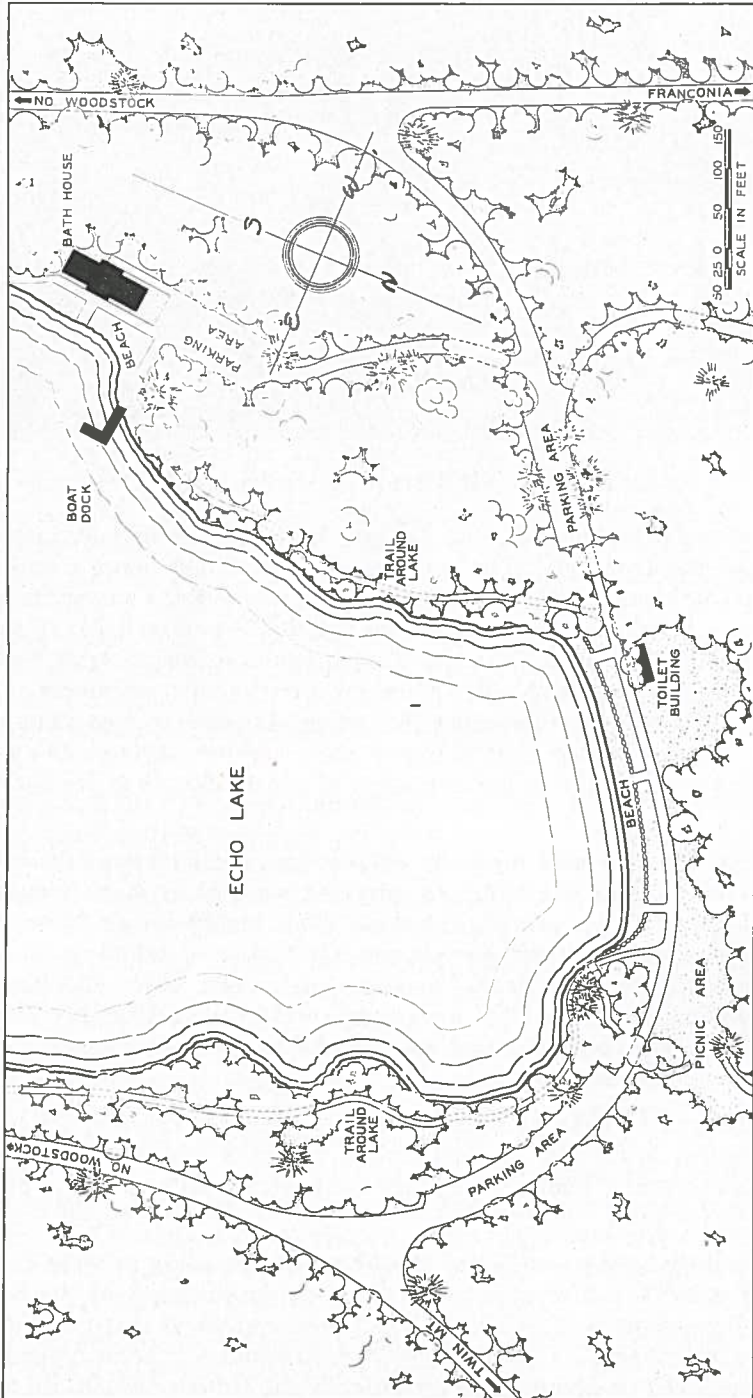
*Skiers Using the New Slope at Mt. Prospect State Park*

based on plans prepared by the Design, Development and Maintenance branch of the Division. The projects are reported in more detail elsewhere in this report. Separately financed but also carried out by the work camp were improvements at Crawford Notch Reservation, Mt. Prospect Park and for the Aerial Tramway Commission on the ski trail developments in Franconia Notch. The office and merchandise storeroom proved to be an efficient operation under the acting manager, so that plans were made in the autumn of 1946 to carry these services through the winter to inexpensively facilitate the operation of the Profile Shop for the 1947 season.

Anticipating the need for better and more specific knowledge of the physical features of the Notch, a survey crew was at work frequently during both years gathering basic data. This included such information as to water systems, sewerage systems, the layout of buildings, location of roads, location and size of parking areas and other facilities. A mutual exchange of information was arranged with the Highway Department. The data now at hand will be the basis for a master plan of maintenance and development.

The League of New Hampshire Arts and Crafts renewed its prewar establishment in the old railroad station for sales and demonstration of handicraft work. The Commission authorized cooperation with the League in its work.

Preparatory to the transfer of the Flume Reservation to state custody January 1, 1947, conferences were held with the directors of the Society for the Protection of New Hampshire Forests to effect this transfer and continue operations. The area was inspected and a general understanding was reached involving arrangements for the transfer of certain equipment and properties not covered in the original transaction.



*Development Plan for Echo Lake—Franconia Notch State Reservation*

## RECOMMENDATIONS OF DIRECTOR OF RECREATION

About 38% of the people answering questionnaires in surveys conducted by various agencies, covering the territory east of Chicago and north of the Mason-Dixon Line, indicated that in prewar years they used the recreational facilities of New England. More recent surveys purport to show that these same people are planning in large numbers to travel to other sections of the country for their recreation in the postwar years. Those replying to recent questionnaires indicate that for their vacations in the immediate future only 23% expect to seek their recreation in New England, and only 6% plan to spend their vacations in New Hampshire. We now note strong indications that states outside New Hampshire will greatly expand their state-owned facilities and increase their advertising for the recreational dollar.

This indicated drop in potential recreation income within our state would seem to point out that every possible effort should be made to improve our recreational establishment and accommodations for visitors. This applies to the operations of this Division, since our surveys show that patronage at state-operated parks and reservations is in the ratio of three out-of-state persons to each inhabitant of this state. Thus, it is indicated that present services and accommodations should be maintained and improved, and that more information should be distributed concerning areas available for public recreational use in New Hampshire. These steps would give assurance to our commercial recreation industry that the state is endeavoring to provide a favorable background to help reduce such losses in the recreation business as are indicated by statistics.

Since the war, a strong renewal of interest by both public and private agencies in the fields of conservation and recreation has taken place. This Division already has been called upon to cooperate in the establishment of a youth conservation camp at Bear Brook State Park. There also is strong interest in the establishment of a water-safety training institute for youth leaders and candidates for the position of lifeguard in various communities. By cooperating with others in such efforts, the state not only would be increasing the skill, knowledge and understanding of important values in these fields, but also would at the same time assist our own residents with vocational training and enable them to compete for positions with out-of-state people who may have opportunities for that training. Since the location, natural features and housing accommodations at Bear Brook State Park provide the basic needs for such institutes, it should be an objective of this Division to cooperate with responsible groups by offering the services of this area and other assistance.

It has been found that most of the visitors who use public recreation areas go there for a specific purpose, such as picnicking, hiking or camping. Most of the areas have natural features, in many cases not obvious

to the casual visitor, which would be of interest to people if some means could be found to publicize them. This broadening of visitors' interest should have the effect of more frequent use at the areas and a deeper attachment to New Hampshire's scenic features. In order to develop this interest, it is felt that services in the field of natural history could well be employed at some parks. Expenditures for this service would be returned through increased patronage. Naturalist services carried out experimentally before the war provided valuable experience, and should be broadened as rapidly as practicable.

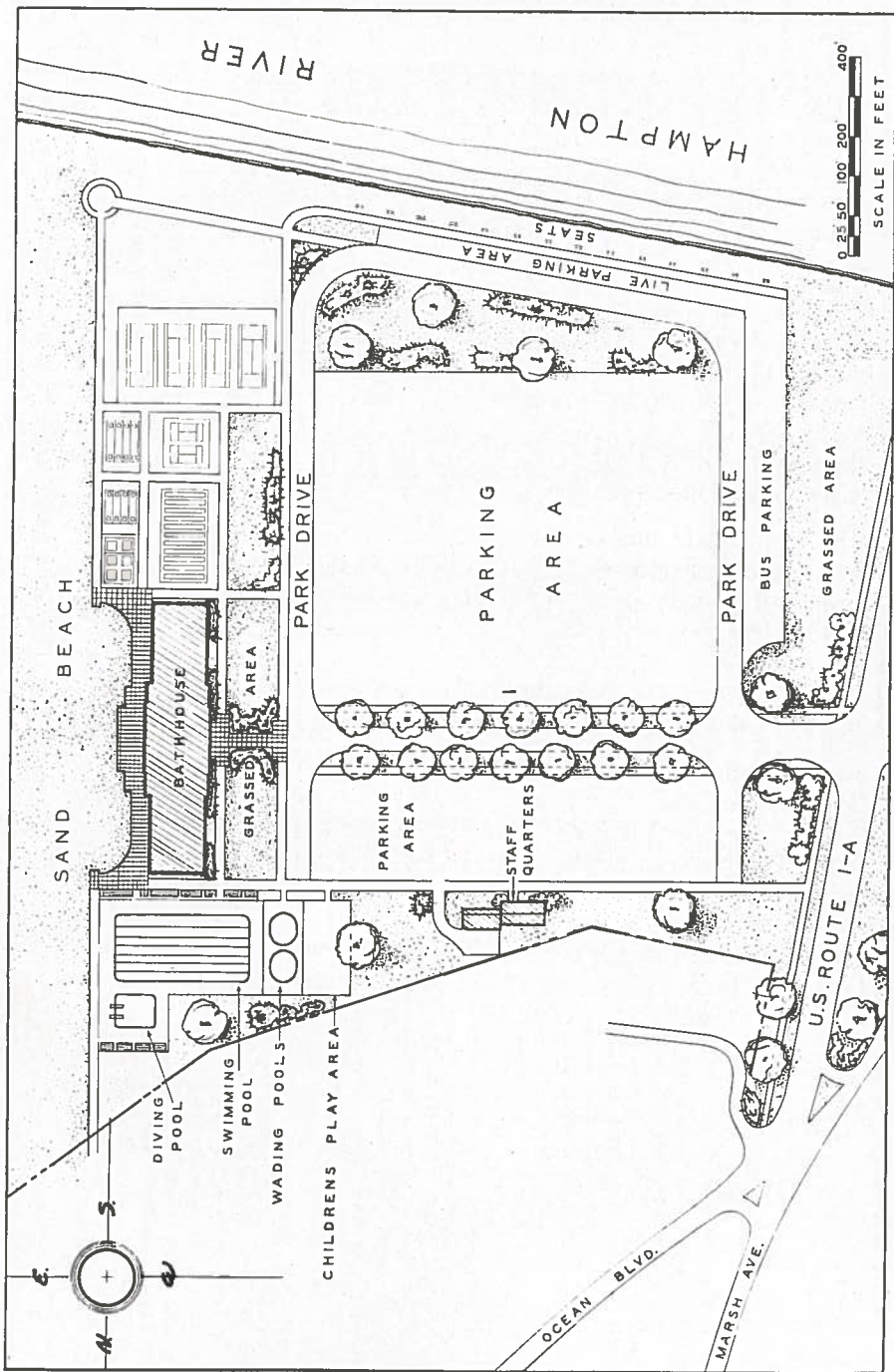
Future planning is now essential, not only to the Division but also to the state's commercial recreation industry. Public recreation is a relatively new venture in New Hampshire. The facilities we now have came into existence in the early 1930s, when experience was slight and it was impossible to anticipate the broad public acceptance that has occurred. Now, in the late 1940s, we are attempting to administer facilities geared to the tastes and needs of 15 years ago. In some cases, park and reservation patronage has increased 1,000 percent.

The majority of our areas cost the state next to nothing for the land or the original development. Much of the land came through gifts, and the work of developing it was done by federal and state relief agencies. The point has been reached where the age and capacity of facilities at public recreation areas make them no longer capable of supplying the recreational wants of the people who use them. Many areas are not sufficiently developed to provide optimum financial returns.

In 12 seasons of operations, we have watched the trends of public use at these areas and gained experience in catering to vacationists. We have seen the overloading of some facilities beyond the capacities provided. The next important step is to apply this experience to the redevelopment of many facilities which are outmoded and inadequate. The Division should be encouraged to have its plans ready for this rehabilitation program to take advantage of the funds and manpower which may become available in the future. It is now felt desirable to prepare a work-pile of plans for long-range development in all areas.

It would appear advantageous for the state to provide funds for the rehabilitation of several recreation areas in which there already is considerable investment of public and private funds, in order to keep these facilities in a condition to serve the functions for which they originally were created.





Development Plan for Hampton Beach State Park



**OPERATION, MAINTENANCE, IMPROVEMENT AND ADMINISTRATION EXPENSES  
OF STATE RECREATION AREAS (RECREATION GENERAL)  
FOR THE PERIOD JANUARY 1 - DECEMBER 31, 1945, INC.**

Area	No. of Personnel	Av. Monthly Wage	Total Wages	Other Expenses	Total Maintenance Cost	Total Income	Net Cost	Estimated Attendance	Net Cost per Visitor
Bear Brook State Park	7	\$129.00	\$7,983.68	\$1,950.49	\$9,934.17	\$4,399.98	\$5,534.19	39,813	\$1.39
Bellamy State Park	5	102.00	1,309.31	258.49	1,567.80	8.50	1,559.30	35,000	.44
Cardigan State Reservation			24.00	18.85	42.85	7.40	35.45	350	.112
Echo Lake State Park			298.20	3.00	301.20		301.20	6,409	.046
Endicot Rock State Park	2	140.00	940.71	178.16	1,118.87	1,666.05	*547.18	14,100	*.038
Forest Lake State Park	1	138.00	384.58	19.95	404.53	531.30	*126.77	6,610	*.019
Hampton Beach State Park	7	109.00	3,618.42	1,568.81	5,187.23	3,736.52	1,450.71	30,700	.046
Wingslow Site State Park	1	138.00	827.98	124.93	952.91	497.21	455.70	5,000	.091
Kingston State Park	4	112.00	2,245.60	313.55	2,559.15	1,623.76	935.39	15,000	.062
Milam Hill State Park	1	50.00	175.00	66.23	241.23	78.74	162.49	950	.171
Monadnock State Reservation	1	138.00	1,235.73	222.61	1,458.34	746.48	711.86	12,500	.056
Moose Brook State Park	3	117.00	1,136.87	338.35	1,475.22	681.56	793.66	15,500	.051
Mt. Prospect State Park	1	182.00	832.22	552.79	1,385.01	197.73	1,187.28	2,300	.516
Peterborough State Pool	4	125.00	1,351.16	245.55	1,596.71	108.55	1,488.16	9,200	.161
Wadleigh State Park			330.00	60.25	390.25		390.25	1,200	.325
Wellington State Park	3	110.50	1,221.08	216.48	1,437.56	1,659.20	*221.64	17,000	*.013
Wentworth State Park	1	102.00	406.10	160.97	567.07	382.47	184.60	4,000	.046
White Lake State Park	3	115.50	1,434.73	435.97	1,870.70	1,622.84	247.86	17,000	.014
18 Area Totals	44	\$118.00	\$25,755.37	\$6,735.43	\$32,490.80	\$17,948.29	\$14,542.51	232,632	\$62
*Net income									

**ADMINISTRATIVE AND OVERHEAD EXPENSES**

(from Recreation Regular Fund)

Administrative Office	3	\$6,087.93	\$864.69	\$6,952.62					
Operation Administration	1	1,058.15	248.42	1,306.57					
Supply Depot		149.68	75.87	225.55					
Des., Dev. & Maint. Adm.	2	2,958.20	463.40	3,421.60					\$32,490.80
Area "A" Work*			670.65	670.65					Administrative & Overhead
	6	\$10,253.96	\$2,323.03	\$12,576.99					Total Expenses (Regular)
									\$15,067.79

**SUMMARY EXPENSES**

Operations \$32,490.80  
Administrative & Overhead 12,576.99

\*Repairs and replacements of a long-term nature.

OPERATION, MAINTENANCE, IMPROVEMENT AND ADMINISTRATION EXPENSES  
OF STATE RECREATION AREAS (RECREATION GENERAL)  
FOR THE PERIOD JANUARY 1 - DECEMBER 31, 1946, INC.

Area	No. of Personnel	Mo. of Service	Monthly Average	Total Hours	Other Expenses	Maintenance Cost	Total Income	Net Cost	Estimated Attendance	Net Cost per Visitor
Bear Brook State Park	9	\$137.00	\$14,915.26	\$3,894.48	\$18,809.74	\$5,863.34	\$12,946.40	50,764	\$0.255	
Bellamy State Park	4	121.00	1,970.62	204.56	2,175.18	15.00	2,160.18	18,000	.120	
Cardigan State Reservation	0		22.80	12.74	35.54	10.60	24.94	4,106	.005	
Echo Lake State Park	2	118.00	1,036.19	90.38	1,126.57	701.35	425.22	10,000	.042	
Clough State Reservation	0		125.20	22.70	147.90		147.90	5,000	.029	
Endicott Rock State Park	3	142.00	1,225.92	304.43	1,530.35	2,448.77	*918.42	22,681	*.040	
Forest Lake State Park	3	123.00	788.92	141.08	930.00	634.79	295.21	7,306	.040	
Hampton Beach State Park	12	125.00	6,612.80	3,213.47	9,826.27	9,254.41	571.86	45,000	.012	
Toll Gate State Park	2	102.00	763.82	309.43	1,073.25	174.40	898.85	2,244	.400	
Winslow Site State Park	1	160.00	1,914.45	190.68	1,105.13	828.29	276.84	7,803	.035	
Kingston State Park	4	123.00	2,995.04	323.63	3,318.67	3,363.42	*44.75	37,191	*.001	
Milan Hill State Park	1	155.00	614.51	179.76	794.27	118.09	676.18	1,501	.450	
Miller State Park	1	120.00	240.73	75.10	315.83	239.90	75.93	5,872	.012	
Monadnock State Reservation	2	134.00	2,525.31	235.69	2,761.04	1,471.44	1,289.60	15,260	.084	
Moose Brook State Park	3	123.00	1,467.73	350.12	1,817.85	679.76	1,138.09	6,449	.176	
Mt. Prospect State Park	1	182.00	956.59	628.81	1,585.40	377.72	1,207.68	3,059	.394	
Peterborough State Pool	4	130.00	1,065.62	87.20	1,152.82	162.50	990.32	9,450	.104	
Wadleigh State Park	2	141.00	773.09	135.46	908.55		908.55	3,000	.302	
Wellington State Park	4	121.00	2,173.32	291.23	2,464.55	2,323.05	141.50	27,477	.005	
Wentworth State Park	2	117.00	910.17	367.80	1,277.97	616.07	661.90	6,381	.103	
White Lake State Park	4	129.00	2,494.44	723.99	3,218.43	2,484.63	733.80	17,133	.042	
Area Totals	62	\$133.00	\$44,592.57	\$11,782.74	\$56,375.31	\$31,767.53	\$24,607.78	305,677	\$0.80	
*Net income										

ADMINISTRATIVE AND OVERHEAD EXPENSES

	(from Recreation Regular Fund)	Operations	Administrative & Overhead	Total
Administrative Office	4	\$2,048.20	\$11,909.55	\$14,957.75
Area Operation Adm.	1	3,474.28		3,474.28
Supply Depot	1	85.00	728.56	813.56
Des., Dev. & Maint. Adm.	4	1,764.46	7,800.47	9,564.93
"M" Work*		5,772.00	7,816.30	13,588.30
Area Totals	10	\$20,799.23	\$10,929.93	\$31,729.16
*Repairs and replacements of a long-term nature.				\$88,104.47

SUMMARY EXPENSES

Operations \$56,375.31  
Administrative & Overhead 31,729.16



SUMMARY OF RECEIPTS AND EXPENDITURES FOR BIENNIUM 1945 AND 1946

1945 (Calendar)		1946 (Calendar)	
<b>GROSS INCOME AND EXPENSES</b>			
<i>Ex.penses</i>	<i>Income</i>	<i>Ex.penses</i>	<i>Income</i>
Recreation General \$45,067.79	\$17,948.29	Recreation General \$ 88,104.47	\$31,767.53
Recreation Special 20,318.99(1)	18,860.98	Recreation Special 45,687.07(1)	51,144.30(2)
Capital Budget—Franconia 4,308.11		Capital Budget—Franconia 39,403.80	
Special Maintenance—Hampton 6,000.00		Capital Budget—Hampton 20,000.00	
<b>TOTAL GROSS</b>	<b>\$75,694.89</b>	<b>TOTAL GROSS</b>	<b>\$193,195.34</b>
(1) Includes cost of goods for resale \$10,130.66—Profile and Hampton		(1) Includes \$28,853.20 cost of goods for resale Profile and Hampton	
(2) Includes sale of wood, buildings, and surplus equipment		(2) Includes sale of wood, buildings, and surplus equipment	
<b>OPERATING EXPENSES AND INCOME</b>			
<i>Ex.penses</i>	<i>Income</i>	<i>Ex.penses</i>	<i>Income</i>
Recreation General \$44,397.14	\$17,948.29	Recreation General \$ 80,288.17	\$31,767.53
Recreation Special 10,188.33	8,730.32	Recreation Special 16,833.87	22,291.10
<b>TOTAL OPERATING EXPENSES AND INCOME</b>	<b>\$26,678.61</b>	<b>TOTAL OPERATING EXPENSES AND INCOME</b>	<b>\$54,058.63</b>
<b>MAINTENANCE AND INVESTMENT EXPENDITURES</b>			
Recreation General \$ 670.65		Recreation General \$ 7,816.30	
Capital Investment \$ 4,308.11		Capital Investment \$ 39,403.80	
Special Maintenance—Hampton 6,000.00		Capital Budget—Hampton 20,000.00	
<b>TOTAL CAPITAL INVESTMENT</b>	<b>\$10,308.11</b>	<b>TOTAL CAPITAL INVESTMENT</b>	<b>\$59,403.80</b>
<b>SOURCES OF FUNDS AVAILABLE FOR EXPENDITURE FOR FISCAL YEARS 1945-46 AND 1946-47</b>			
<b>APPROPRIATIONS</b>		<b>TOTALS</b>	
1945-46	1946-47	1945-46	1946-47
Recreation General—G 6431 \$ 39,520.00	\$45,320.00	\$ 64,520.00	\$ 75,320.00
Recreation Special—S 3524 6,941.18	5,483.17	\$30,000.00	\$ 51,144.30
Capital Budget—Franconia 50,000		18,860.98	25,802.16
Capital Budget—Hampton 20,000.00		50,000.00	50,000.00
Special Maintenance—Hampton 6,000.00		20,000.00	20,000.00
<b>TOTAL AVAILABLE</b>	<b>\$122,461.18</b>	<b>\$43,860.98</b>	<b>\$81,144.30</b>
			<b>\$166,322.16</b>

# NEW HAMPSHIRE PRINCIPAL STATE PARKS AND RESERVATIONS

● PARK OR RESERVATION

1946

