

*The Saco Valley looking North from Cathedral Ledges, North Conway.*  
(Departmental photo)

**State of New Hampshire**

**BIENNIAL REPORT**

*of the*

**Forestry and Recreation  
Commission**

*For the Two Fiscal Years  
Ending June 30, 1940*

CONCORD  
1941

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# Report

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

The Forestry and Recreation Commission hereby submits its report of the work of the department for the years 1939 and 1940 and recommendations for the next biennial period.

Two years ago we were in the midst of planning and effecting programs of timber salvage, clean-up of inflammable material and fire control organization to meet the situation ahead brought about by the hurricane. The Northeastern Timber Salvage Administration was set up as an operating division of the Federal Surplus Commodities Corporation securing funds on notes through the Disaster Loan Corporation and using, as collateral, salvaged timber purchased at designated delivery points. Congress appropriated five million dollars, which was afterwards increased by half a million more, for fire hazard reduction known as the New England Forest Emergency Project. The Forest Service of the U. S. Department of Agriculture was made the work agency to carry out both the salvage and fire hazard reduction programs and to give assistance with man power and equipment to the state authorities in fire control. An immense amount of organization and detail planning was necessary and trained technicians from national forest districts throughout the country were temporarily transferred and assigned to this Administration headquarters in Boston and to the respective New England States to direct the federal work.

It was important that the states should take a leading part in the planning and execution of the federal programs and that legal functions of the states should not be interfered with by those who came in to assist. The New Hampshire State Timber Salvage Committee and sub-committees appointed by the Governor, the State Forestry and Recreation Department, the Extension Service of the University, selectmen and individual town representatives gave freely of their time in the interests of the state to advise federal agents unfamiliar with local conditions.

The Governor authorized the State Forester to set up a state advisory office and to appoint a local experienced timber salvage advisory agent in each of ten districts to assist owners of down timber who were unfamiliar with timber values and procedure necessary for them to follow in salvaging their down timber.

The department also directed the operation of two airplanes loaned by the Federal Bureau of Entomology and Plant Quarantine to locate and map the principal down timber areas south of the White Mountains.

The legislature of 1939 gave generous support to the emergency programs in salvage and fire protection. Some emergency legislation was passed. The regular budget for the support of the department and a

special forest fire and salvage appropriation of \$108,000 for the two year period were approved. The special appropriation set up \$8,000 to continue the salvage advisory work and \$30,000 as a reserve over and above the regular appropriation for reimbursement to towns for fire costs. The balance of \$70,000 was to pay for half the cost of purchase of greatly needed fire tools for the towns and for the state fire equipment, additional fire lookout stations, increased district supervision including four fire dispatchers and administrative expenses to meet the enlarged program for 1940 and 1941.

The work as above outlined has been carried out. The purchase of hurricane timber by the government terminated May 29, 1940. During the two years over 402,000,000 feet of logs mostly pine were delivered to about 530 government receiving sites in the state by 5,973 forest owners for which they were paid \$4,656,953; in addition, 467 owners sold 29,000 cords of pulpwood to the government. The volume of log purchases by the government in New Hampshire was 61 percent of the total purchased in all the New England states.

The amount of hurricane lumber cut by private owners to December 31, 1940 and not sold to the government was estimated at 200,000,000 feet exclusive of pulpwood. The total lumber production for 1939 was very close to the 1907 production which was the highest ever recorded in New Hampshire. Most of this but not all was from hurricane felled timber.

The hazard reduction program is substantially completed but will continue to a limited extent until remaining federal funds are exhausted and the New England Federal Emergency Project terminates by law on June 30, 1941. Burning of brush not permitted during fire danger months necessitated a policy of piling or ricking during such months and returning to burn these piles during the late fall and winter following.

To date 4,000 miles of road and about 50,000 acres of debris covered land adjacent to highways, railroad rights-of-way, buildings and highly used areas, trails and wood roads, of greatest danger to human life and valuable property have been reasonably well cleared of inflammable material. One million man days of labor by federal employees have been thus expended, including WPA and other labor, 800 CCC enrollees from five state camps and about 250 men housed in five specially located work camps where other help was least available. The above figures do not include work on the White Mountain National Forest which was carried out in a program of its own and with special funds for the purpose.

Federal technicians also assisted the State Forester by giving fire training to all the camp and work crews employed in salvage and hazard reduction and in cooperation with district chiefs to many town wardens, deputy wardens and selected local men, estimated at nearly 5,000 altogether residing within the state. Much of the warden training was done



in the woods after the day's work and on their own time. All work crews and their equipment as well as storehouses of equipment specially located were available for use when called upon by the state to fight major fires.

The chief contributions that the state could make to these far-reaching programs were the services of the State Forestry staff, district fire chiefs and other state and local agencies in planning and carrying out the work. Until July 1, 1939 when the state emergency appropriation became available, the department had beyond the usual operating expenditures and CCC help within allowable travel distance of the camps only \$10,000 in federal Clarke-McNary cooperative fire funds with which to repair telephone lines, cabins, lookout towers, two of which had been blown down, employ two additional district chiefs, start the construction of additional fire stations, employ fire dispatchers at several district headquarters and take other precautions necessary in preparation for the 1939 fire season. The Governor and Council provided funds for the expenses of airplane mapping and for the salvage advisory work until emergency appropriations became available.

Salvage of merchantable hurricane timber on the state forests and reservations has been done along with other work. The damage was particularly severe on portions of both Franconia Notch and Crawford Notch Reservations, Monadnock, Wadleigh Park, Haven, and the Fox Demonstration Forest. As with private ownerships, the standing timber on many of the state areas was most highly prized for scenic and recreational values. On portions of recreational areas heavily used during the summer months efforts were made to remove the logs and clean up the areas as much as possible before the 1939 season. In spite of this effort Wadleigh Park, Monadnock and other areas were sorry places to those familiar with their former beauty. While fire hazard could not be reduced before the fire season of 1939 many areas and trails across state and national forest lands were of necessity posted and closed to use. Practically all trails on public lands were open for the 1940 season.

It was possible to finance operations for salvage on the state lands because of the State Forest Improvement Fund which is a continuing fund. To December 31, 1940 the net cost of salvage and urgent clean-up work as a result of the hurricane on 24 state areas was \$60,696.12. Sales of logs, pulpwood and other products, the larger part of which, except pulpwood, was to the government, amounted to \$65,501.52, making a net gain together with the accounts receivable of \$8,364.99. This work is not yet completed as some spruce and hardwoods are still being salvaged. Much necessary clean-up remains to be done where recreational use is involved which will reduce the gains.

Forest fire preparedness to efficiently meet heavy slash fire conditions now existing over wide areas must be well organized and operate with speed and in accordance with definite plans worked out beforehand.

Such plans take into consideration a detailed knowledge and inventory of all local town resources in supervision, man power and equipment. When a fire starts which cannot be controlled by the local warden, the necessary resources can best be supplied through the district chief's office which is fully acquainted with all the facilities of the towns within the district, knows what other fires may be in progress and from what sources men and equipment can be furnished. Exceptions are made where certain towns are designated as first line of defense towns for wardens in adjoining towns who have few resources at hand. The nearest lookout station to the fire and the town warden at the fire keep the district office informed. The district chief goes to the fire to advise with the warden or to take charge if it threatens to become a major or project fire and outside forces are necessary. A district office dispatcher, who is as familiar with the entire situation as the district chief, is a necessity in order to give instant attention to calls from the lookouts, wardens and all others and to enable the district chief to be relieved for field duty. The dispatcher at all times knows where to reach the district chief in the field, advise him of any fire reported, action taken and exact location of the fire. The district office contacts an adjoining district office or Concord when and as required. Only a district office is authorized to dispatch CCC crews to a fire.

Aside from fire dispatching the district office is the coordinating agency for all fire work in a district. Fire reports, fire bills, copies of warden permits to burn, lookout station reports of smokes and fires out of control, portable mill permits—all pass through the district office. Inspection of mills, investigations of fire causes, illegal slash, burning without permit and prosecutions for violation are now handled by district chiefs working with the wardens.

As built up to meet extra fire needs, the department increased the number of state lookout stations by four and has employed three district chiefs covering Rockingham, Hillsborough, Cheshire and part of Sullivan County where only one was employed before. One of the two additions is the federal paid blister rust agent for Cheshire County who has taken on fire duties with only slight increase in cost beyond expenses.

The department turned over Black, Cabot and Stinson lookouts for operation by the White Mountain National Forest organization, operated stations at Sugarloaf and Smart's Mountain, which were former stations, and operated new stations at Bear Mountain (Bear Brook Reservation), Miller Park, Sam's Hill, Craney Hill and Warner Hill, making a net gain of four state stations from 27 to 31.

Four clerk-dispatchers have been employed at state expense in the southern and western districts, one serving with two district chiefs with headquarters at Nashua and one serving each of three district chiefs who are also blister rust agents mostly under federal salary and receiving



state expenses. Dispatchers in these three districts are not only needed in handling office work connected with the fire organization but also that which relates to blister rust control, to enable the district chiefs to carry their combined schedules of work in the field.

In four other state fire districts surrounding the White Mountain National Forest it has been possible to receive the benefits of fire dispatching without cost to the state through the offices of the four federal district rangers where clerk-dispatchers are employed. These dispatchers cooperate with the state fire organization by receiving all calls to the district chiefs, keeping in touch with them in the field and when needed, dispatching help to towns according to plans worked out in advance. North of the White Mountain region, in place of dispatchers, special arrangements are worked out for using offices of the County Agent at Lancaster and the Brown Company at Berlin to establish the necessary telephone communications between wardens, state district chiefs, federal rangers and others concerned with fire control work.

The above paragraphs relating to the fire organization are intended to show the importance of quick communication and understanding between the towns and fire districts. Though major or project fires may be infrequent, such a fire is capable of burning many thousands of acres with untold damage, and costing far more to control than the extra organization and preparedness would cost the state for an entire season.

Two complete fire seasons have passed since the hurricane. The season of 1939 was moderately dry—above the average. While the state fire organization was not so well prepared as in 1940 the public was cooperative and fire minded. Although there were more fires each year than in the average year before the hurricane, most of them were quickly controlled and burned but small areas. In 1939, however, there were a number of slash fires of serious proportions which might have burned even larger areas except that the full strength of combined state and federal forces were brought into action and in some instances were kept in action several days and nights at a time before the fires were entirely extinguished. The three most serious fires were the May fire in Sharon, the June fire in Lyme and Dorchester and the July fire in Lyman. All were in heavy down timber sections with logging operations in progress and the soil exceedingly dry. These three fires required the setting up of fire camps for feeding and sleeping men and obtaining CCC help from national forest camps as well as other camps outside the state after exhausting our own local and CCC resources. There were no major project fires in 1940.

During the next two seasons it seems necessary to maintain as nearly as possible the same state facilities as were available the last two seasons because the fire situation is likely to be far less favorable than in 1940 and there will be no federal assistance available except the CCC after next

June 30th. The joint dispatcher for the two south districts having previous headquarters at Nashua will be dispensed with. Dispatchers should be continued for the Keene, Lebanon and Concord districts under the same district chief organization as at present.

It is likewise imperative to operate and maintain the net gain of four additional fire lookout stations which were constructed and have been operated the past two seasons. The fire training program so well under way at the present time should also be continued. Since last July 1 the department has employed a trained deputy warden from a town centrally located to carry on with the district chiefs the training program previously inaugurated with the help of federal technicians. There is in preparation by the state organization and the help of training experts a new fire manual to furnish the detailed information needed to assist the wardens, deputy wardens, lookouts and others in the performance of their fire duties. Acknowledgment is made to the U. S. Forest Service particularly for the assistance of Paul Morton who has been loaned to the department for temporary fire training work.

The regular fire appropriation budget for each of the next two years in the absence of special emergency funds for extra lookouts and extra district organization and expenses is increased by \$11,500 over 1938 and 1939 as a necessary minimum cost to give reasonably adequate fire protection. The unexpended balance of the emergency appropriation of 1939 should be made available for the two ensuing years as a reserve for paying fire bills to towns over and above the amount of the regular appropriation of \$7,500 each year and for meeting half the cost of additional fire tool orders from the towns.

Public attention as never before is being directed to the status of existing and prospective forest resources. The public is beginning to recognize what foresters have long foreseen, that we are confronted with a forest industrial poverty as a result of excessive drain of remaining merchantable timber supplies where industries are at hand to exploit them, inability to find uses for low quality timber and lack of permanent industries to produce forest products where timber is low in quality and widely scattered. The rapidly increasing consumption of the better grades of hardwoods and spruce chiefly for the pulp and paper industry is of growing importance in relation to our present and future resources. The permanent wood using industries upon which small communities throughout the state have long been dependent are gradually disappearing because supplies of raw material of suitable species and sizes are no longer easily available.

The forced salvage or loss of probably more than a billion board feet of hurricane felled timber and young growth since 1938, much of which was of recreational value not subject to ready sale, has had a profound effect in further reducing our forest resources. These losses affect valuations, employment in industries and markets and they depreciate recrea-

tional values upon which our state so greatly depends. All this is taking place in a world of economic upheaval and extraordinary requirements of industry in connection with National Defense. Termination of importations of wood products from Sweden and Canada and dependence of England upon Canadian and United States timber and pulp are resulting in increased demands for marketable products wherever they may be found.

Among small and large forest owners and organizations there is much constructive thinking and discussion of our national and state forest problems. Educational work by the Extension Service, benefit payments to farm owners under the AAA, establishment of marketing cooperatives and the studies and investigations of governmental agencies relating to forestry and soil conservation are showing forest owners the necessity of balancing annual production against annual growth and to prevent unnecessary depletion of our resources. Restrictive legislation is now pending in a number of states and there will be more in the very near future. Various organizations in New England have made investigations and prepared reports dealing with future programs of forestry in New England in line with similar efforts in other parts of the country.

A comprehensive study of forest conservation for the entire country has been made by a Joint Congressional Committee which is to report its findings early in 1941. It is expected that recommendations to Congress dealing with private forest regulation will provide either for direct federal control or the setting up of state and district boards, operating through the respective state forestry departments.

Members of the Commission and the State Forester have cooperated with all agencies studying land use and regulatory procedures for private lands during the past year or more. It is our belief that federal legislative programs either direct or in cooperation with the states are inevitable. Such programs should be confined to forest lands and similar legislation should be effective in states of the same region. A way should be found as soon as possible to relieve growing timber from taxation and perhaps apply the principle of a tax on the cut or yield of timber based on the stumpage value at the time of severance or some other more satisfactory plan.

W. R. BROWN,  
H. K. ROGERS,  
OWEN JOHNSON,

*Forestry and Recreation Commission*

JOHN H. FOSTER, *State Forester*

## PROGRESS IN OVERCOMING 1938 HURRICANE DISASTER

H. J. EBERLY, *U. S. Forest Service*

### General Situation



HE biennial report for 1937-1938 described the timber blow-down disaster to New Hampshire forests caused by the New England hurricane of 1938. Two years have now passed and the following is a resume of cooperative private, state and federal achievement in meeting this emergency and salvaging as much as possible of the New Hampshire damaged timber.

The hurricane struck parts of Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island and New York, but it covered a greater area and the damage was more extensive in New Hampshire than in any of the other states.

The magnitude of the hurricane disaster called for national recognition, and at the request of New England private and public agencies funds were made available by the federal government; the New England Forest Emergency Project was established, and supervision of the project was placed under the direction of the U. S. Forest Service. Two major lines of action have been undertaken—one, to reduce the tremendously increased fire hazard caused by the blown-down timber and, two, provisions whereby blown-down timber of merchantable size could be salvaged and the owners paid for their logs rather than suffer a complete financial loss on their wind-thrown timber.

### Hazard Reduction Program

Hazard reduction work priorities were established and clean-up work first performed where human life and valuable property were most seriously endangered. Later this clean-up work was extended to areas adjacent to highways; woods roads were opened up to reestablish lines of transportation and communication, as well as to reduce hazard adjacent to villages, resort property, parks, etc. Work areas were located and clean-up priorities established in cooperation with state, town and private agencies. Approximately 50,000 acres of blow-down have been cleared, 4,000 miles of roadside treated, and 1,000,000 man days of labor expended in reducing our New Hampshire fire hazard situation.

At the peak of employment, there were approximately 2,000 Federal New England Forest Emergency laborers, 2,000 WPA, 800 CCC and five hazard reduction camps of 50 men each employed on brush disposal work in this State alone. Excluding the WPA and CCC, the Forest Service has spent approximately \$2,000,000 to date for this hazard reduction work in New Hampshire through employment of the New England Forest Emergency workers. This expenditure is exclusive of funds spent on the White Mountain National Forest. The federal program of hazard reduction will be terminated on June 30, 1941.

In addition to the actual physical accomplishments attained in the gigantic job of hazard reduction, there are other and perhaps more lasting benefits gained for the future protection of New Hampshire forests. For example, during the past two years the state, through cooperation extended by the federal NEFE organization, has trained a large number of local people in the art of effective fire suppression. These include town fire fighting crews, local wardens and a vast number of local men who were employed on hazard reduction work. A conservative estimate

places the number of local men securing such training at 5,000. The state has also improved detection, communication and fire fighting technique.

Another innovation in cooperation with the federal NEFE organization was a daily fire weather danger forecast during the periods of fire danger. In New Hampshire, information for these broadcasts was secured daily from 15 danger reading stations or small weather observatories located at strategic points throughout the state and their findings telegraphed daily to the Boston Weather Bureau officials. These reports then correlated with those received from some 35 stations in the other New England States and a 24-hour forecast made and wired to various broadcasting stations where the forecasts were put on the air. These forecasts although not 100 percent accurate, have served to keep the public's attention focused on the fire danger and the need of being careful to prevent fires during periods of fire weather.



*Wet storage of hurricane timber at Clark's Pond, Auburn, N. H.*  
(Photo by Newman)

#### **Timber Salvage Program**

By far the greatest volume of timber blown down was in private ownership. The timber salvage part of the federal government's program was for the purpose of salvaging logs for the use of local wood using industries, but was especially developed to enable an owner of blown-down timber to receive some compensation through sale of merchantable logs and pulpwood rather than to suffer a total financial loss.

About 530 receiving sites were established where the private owners could deliver hurricane thrown logs and pulpwood. Log grades and prices were likewise established and private deliveries in New Hampshire started the latter part of November, 1938, within two months after the hurricane. A total of 5,973 New Hampshire forest owners sold 402,479 M



board feet of logs under this program to the federal government for which they were paid \$4,656,953. The volume of log purchases in New Hampshire comprises 61 percent of all logs purchased by the federal government in all of the six New England States. In addition to the logs salvaged 467 New Hampshire woodland owners sold 29,091 cords of pulpwood to the federal government. Part of the logs salvaged have been cut into lumber and the balance stored in ponds. At present 200,000 MBF of lumber are stored in 117 lumber yards and 142,684 MBF of logs are stored in 71 New Hampshire ponds. At the peak of lumber production 101 portable sawmills were in operation under government sawing contracts.

The final date on which the government would accept hurricane logs was May 29, 1940 and now the remainder of the program consists of the disposal of this federally owned lumber and logs. Good progress in this remaining part of the program is already being made. Approximately 10,000 cords of pulpwood have been sold and 26,701 MBF of round and square edged lumber sold at a value of approximately \$542,744. These sales are exclusive of the large sale made to the Eastern Pine Sales Corporation of 425,000,000 board feet much of which will come out of New Hampshire lumber storage yards. In addition to the lumber sold, local New Hampshire wood using industries have already purchased over 16,319 MBF of NETSA logs at a value of approximately \$253,216.

It is hoped that several of the practices established under the NETSA program may also have a lasting benefit to local timber owners and industries such as the establishment of standard log grades and scales, uniformity in improved lumber piling as well as improved sawing practices and cutting for better grades.



## REPORT OF TIMBER SALVAGE ADVISORY AGENCY

ARTHUR G. BOWLER



It was found necessary to organize some sort of bureau of information to which both resident and non-resident owners of hurricane thrown timber could appeal for assistance with their many problems of liquidation. By direction of the Governor and Council the Timber Salvage Advisory Agency under supervision of the State Forester, opened its office in the Boston & Maine Railroad Station at Concord on November 15, 1938 and functioned until March 30, 1940, under the management of Arthur G. Bowler of Goffstown. This location was chosen on account of its accessibility to patrons arriving by train, its space for conferences, parking facilities for woods crews, loads of horses, tractors and other equipment, and its nearness to the State Forestry and Recreation Department headquarters, then at 31 South Main Street.

Field agents were appointed for their knowledge and ability in commercial lumbering problems and geographic residence so as to cover the state in its entirety at a minimum of expense. Philip C. Heald of Wilton served as field supervisor during the period of organization. The following agents were employed for varying lengths of time, the number being reduced as salvage work became organized or was completed:

Samuel F. Campbell, Derry  
Albert A. Carr, Tilton  
Oscar A. Colburn, Bradford  
Floyd L. Cram, Manchester  
Ismond D. Ellingwood, Groveton  
Fred W. Friend, RFD., No. 1, Laconia  
Ivan F. Gilman, 18 Oak Street, Gonic

S. Gray Hannaford, Piermont  
Earl V. Howard, Piermont  
Elwin C. Jewell, West Rindge  
George L. Porter, Alstead  
John W. Prentiss, Drewsville  
Edwin A. Smith, Manchester  
Roger Williams, Center Tuftonboro

Consideration was given to all owners and agents of owners having down timber to salvage, but more to those unfamiliar with or unable to handle their salvage problems. Holdings encumbered by mortgages constituted one of the particular problems.

The agents were called upon to cruise, estimate costs for logging, supply contractors, woods help, teams, trucks, sawmills if necessary, and to perform other sundry tasks as well as to obtain financial help from banks. Most banks throughout the state cooperated closely with the program and the agents received most courteous service. Acknowledgment is made of the cooperation given by the town chairmen whom our agents contacted for local information and who gave freely of their time without compensation.

The supply of intra-state contractors, woods help, logging equipment, etc. was found inadequate to cope with the situation and therefore it was necessary to advertise for and register additional ones from outside the state and even New England. The number of individual contractors was 365. Registrations for woods work were 698 and for trucks and tractors 124. Only 27 teams were registered.

The agents traveled 177,914 miles and made 6,950 contacts with owners. They were responsible for letting contracts covering 233,974,000 B. F. of white pine, 21,645,000 B. F. of spruce, hemlock, Norway pine and hardwoods and 52,190 cords of pulpwood. Great difficulty was experienced in keeping the contracts going and many of course were never completed.

The total cost to the state of maintaining the Salvage Advisory Agency for a period of over sixteen months was \$34,465.97 of which \$24,244.15

was an emergency deficit to and \$8,000.00 was appropriated by the legislature of 1939, while the balance of \$2,221.82 was provided from the Governor's emergency funds.

The number of contracts let through the field agents and the amount of white pine and other timber contracted for are shown by counties in the following tabulation:

<i>County</i>	<i>Number of Contracts</i>	<i>White Pine MBF</i>	<i>Other Species MBF</i>	<i>Pulpwood —Cords</i>
Belknap .....	42	7,686	50	....
Carroll .....	12	2,955	....	....
Cheshire .....	137	41,020	450	4,940
Coos .....	52	6,360	....	21,825
Grafton .....	270	52,160	11,115	3,300
Hillsborough .....	167	20,702	760	750
Merrimack .....	167	31,197	895	3,225
Rockingham .....	36	5,534	....	....
Strafford .....	8	2,053	200	....
Sullivan .....	142	16,670	7,270	1,350
Concord Office .....	134	47,637	905	16,800
	<hr/>	<hr/>	<hr/>	<hr/>
	1,167	233,974	21,645	52,190

## PUBLIC FORESTS

W. F. HALE



HE Forestry and Recreation Department has made an effort to obtain the latest acreage of public forest lands in New Hampshire including all agencies. The best estimate of this acreage is 780,640 acres divided as follows:

Federal White Mountain National Forest	663,288	Acres
Federal Bear Brook Recreational Demonstration Area	6,436	"
Federal U. S. Engineers: Franklin, Blackwater and Surry projects (Acreage not complete)		
State Forestry and Recreation Department	41,005	"
State Water Resources Board (Pittsburg)	2,800	"
State Institutions	2,947	"
County (Farm forest lands)	3,425	"
Towns (Gift, Purchase, Water Supply and Defaulted Taxes)	52,502	"
Cities (Mostly water supply)	8,237	"
Total	780,640	"

The acreage of the White Mountain National Forest has been increased by 283 acres since the report two years ago. The 25 percent return of income to the State and towns for 1940 was \$9,209.79. The acquisition of the Bear Brook area has been completed. The U. S. Engineers are now in the process of acquiring lands for the Franklin, Blackwater and Surry projects, and will not be able to report for several months the total acreage of forest land to be held under their supervision. The State Forestry and Recreation Department's acreage has actually decreased by 1,200 acres since last reported due to return of certain lands to the original grantors by terms of the deeds. The Water Resources Board acquired 3,000 acres of land in addition to the flowage area. About 2,800 acres of this area is considered forest land. State institutions, including the University of New Hampshire, Laconia State School, State Prison and Glencliff Sanatorium own 2,947 acres. An estimate of the forest lands of county farms is given as 3,425 acres. The greatest increase of all public agencies is in the towns with over 52,000 acres, due mostly to defaulted taxes. The cities report 8,237 acres, mostly water supply areas.

The hurricane of 1938 damaged the mature timber on many of these public forest lands, especially the White Mountain National Forest, many of the state reservations and institutional lands, and town forests. Special mention of this damage and salvage will be found in other chapters of this report.

### State Forests and Reservations

The Forestry and Recreation Department is custodian of 116 tracts of land comprising 41,005 acres and having an appraisal value of nearly \$1,000,000 including 11 lookout stations located on state land. In order to more clearly understand the several types of land comprising these areas, they have been classified or grouped into four divisions, as follows:

1. Areas principally for recreational use	13	1,128	Acres
2. Areas for management, protection and recreational use	33	30,302	"
3. Areas for management and demonstration	53	9,341	"
4. Areas for other uses	17	234	"
<b>Total</b>	<b>116</b>	<b>41,005</b>	<b>"</b>

## AREAS PRINCIPALLY FOR RECREATIONAL USE

<i>Name</i>	<i>Location</i>	<i>Acreege</i>
Bellamy State Park	Dover	29
Endicott Rock State Park	Laconia	3
Forest Lake State Park	Dalton	420
Hampton State Beach	Hampton	50
Kingston State Park	Kingston	44
Milan Hill State Forest Park	Milan	127
Miller State Park	Peterborough	3
Peterborough State Pool	Peterborough	12
Toll Gate State Park	Warner	17
Wadleigh State Park	Sutton	52
Wellington State Beach	Bristol	97
Wentworth State Beach	Wolfeboro	16
White Lake State Park	Tamworth	258
	<b>Total</b>	<b>1,128</b>

## AREAS FOR MANAGEMENT, PROTECTION AND RECREATIONAL USE

<i>Name</i>	<i>Location</i>	<i>Acreege</i>
*Annett	Rindge-Sharon	1,092
Belknap State Reservation	Gilford	545
*Binney Pond	New Ipswich	77
*Black Mt.	Haverhill	666
Boardman Farm	Haverhill	76
Cardigan State Reservation	Alexandria-Orange	3,090
*Welton Falls	Alexandria	223
*Casalis	Peterborough	247
*Cathedral & White Horse Ledges	Bartlett-Conway	205
*Clough	Weare	309
Connecticut Lakes State Park	Pittsburg	1,130
Crawford Notch State Reservation	Hart's Location & Livermore	5,950
Dixville Notch State Reservation	Dixville	137
*Fay	Lincoln-Woodstock	211
Franconia Notch State Reservation	Franconia-Lincoln	5,244
Green Mt. State Lookout	Effingham	15
Hemenway State Reservation	Tamworth	1,957
Hyland Hill State Lookout	Westmoreland	20
Jeremy Hill State Lookout	Pelham	63
Kearsarge State Reservation	Andover-Salisbury-Warner-Wilmot	2,325
*Merrimack River	Boscawen	151
*Merriman	Bartlett	515
Intervale Ski Slope	Bartlett	13
Monadnock State Reservation	Jaffrey	699
Moose Brook State Forest Park	Gorham	755
Pawtuckaway State Reservation	Deerfield-Nottingham	1,288
Pillsbury State Reservation	Goshen-Washington	3,034
Pitcher Mt. State Lookout	Stoddard	5
*Powow River	So. Hampton	52
Rock Rimmon State Lookout	Kingston	47
*Shadow Hill	Sutton	34
*Strawberry Hill	Bethlehem	60
*Sugar Hill	Bristol	67
*State Forest	<b>Total</b>	<b>30,302</b>

## AREAS FOR MANAGEMENT AND DEMONSTRATION

<i>Name</i>	<i>Location</i>	<i>Acreage</i>
*Allen	Concord	25
*Alton Bay	Alton	214
*Ames	Henniker	15
*Ayers	Canterbury-Northfield	50
*Baker	Rumney	5
Bear Brook State Forest Park	Allenstown	413
*Beech Hill	Keene	23
*Blair	Campton	112
*Blue Job	Farmington	99
*Bowditch-Runnells	Tamworth	54
*Carroll	Warner	29
*Contoocook	Hopkinton	47
*Connecticut River	Charlestown	216
*Conway Common Land	Conway	930
*Craney Hill	Henniker	31
*Davisville	Warner	32
*Dodge Brook	Lempster	222
*Duncan Lake	Ossipee	100
*Everett	Dunbarton	56
Fox Research Forest	Hillsboro	472
*Gay	Jaffrey	49
*Harriman-Chandler	Warner	395
*Haven	Jaffrey	95
*Hodgman	Amherst	18
*Honey Brook	Acworth-Lempster-Marlow	881
*Hubbard Hill	Charlestown	709
*Kimball	Mason	25
*Lead Mine	Shelburne	202
*Leighton	Dublin	75
*Litchfield	Litchfield	122
*Livermore Falls	Campton	134
*Marshall	New Ipswich	20
*Mascoma	Canaan	174
*Mast Yard	Concord-Hopkinton	400
*Meadow Pond	Gilmanton	42
*North Branch	Stoddard	71
*Nottingham	Nottingham	16
*Ponemah	Amherst	63
*Pot Holes and Bear's Den	Gilsum	95
*Province Road	Groton	546
*Ragged Mt.	Andover	76
*Russell	Greenville-Mason	25
*Russell-Abbott	Mason-Wilton	808
*Salmon Falls	Rochester	20
*Scribner-Fellows	Ashland-New Hampton	140
*Sentinel Mt.	Piermont	143
*Sky Pond	New Hampton	119
*Soucook	Loudon	50
State Forest Nursery	Boscawen-Salisbury	257
*Stockdale	Hooksett-Manchester	66
*Vincent	Deering-Henniker-Weare	172
*Walker	Concord	47
*Woodman	Deerfield-Northwood	141
	<b>Total</b>	<b>9,341</b>

\*State Forest

## AREAS FOR OTHER USES

<i>Name</i>	<i>Location</i>	<i>Acreage</i>
Cardigan Mt. CCC Camp	Danbury	17
Chesterfield Gorge	Chesterfield	15
Farrar Lot	Temple	4
Glover Lot	Pembroke	7
Governor Wentworth Farm	Wolfeboro	96
Grant Lot	Fitzwilliam	8
Kearsarge Mt. CCC Camp	Salisbury-Warner	21
Kingston Dam Lots	Kingston	11
Lord Pines	Ossipee	12
Pierce's Island	Chesterfield	5
Pillsbury CCC Camp	Goshen-Washington	19
Plummer's Ledge	Wentworth	3
Randolph Springs	Randolph	3
Sculptured Rocks	Groton	1
Stevens Pines	Nottingham	4
Taylor Lot	Concord	7
Waldron Lot	Northwood	1
	Total	234

## TRACTS ACQUIRED AND CONVEYED DURING THE YEARS 1939 AND 1940

**Acquired by State**

**HYLAND HILL:** The state has maintained a lookout station under lease on Hyland Hill, Westmoreland for many years. In order to better maintain this station, a tract of woodland comprising 20 acres was purchased from Mrs. Gertrude G. Spaulding of Keene, and Mrs. Bertha E. Dixon of Worcester, Massachusetts for \$250. A fair automobile road is now used by the public from the Keene-Westmoreland Highway to a point within a half mile from the tower. Rights-of-way over this road and for the telephone line were also granted by the above mentioned parties. Additional rights-of-way were acquired without cost to the state from Donald J. Williams of Keene and Leon C. Norwood, Treasurer of the Beaver Mills Company, also of Keene.

**ENDICOTT ROCK:** Certain improvements have been made at Endicott Rock which include filling in along the channel side of the park, which has increased the acreage by one acre. This land is now used for recreational purposes, and greatly enhances the development of the park.

**PIERCE'S ISLAND:** The state received a gift of Pierce's Island in Spoford Lake in the town of Chesterfield. This island of five acres has remained in private ownership for a great many years, and through the efforts of Sheriff Frank J. Bennett of Keene who was able to obtain funds from adjoining shore owners, this gift has been made possible. This department has appointed Sheriff Bennett as custodian of the island, where no overnight camping is to be allowed.

**RUSSELL-ABBOTT:** Dr. J. Almus Russell of Mitchell, North Dakota, his sister, Mrs. Louise A. Loring of Louisville, Kentucky, and Miss Jane F. Abbott of Wilton, New Hampshire conveyed to the state 808 acres located in the towns of Mason and Wilton. Of this acreage, 433 acres are in the town of Wilton and 375 in Mason. In order to acquire these tracts, back taxes to the amount of \$206.31 were paid to the towns. Within the area lies Pratt Pond which has in the past served a limited recreational use for that immediate section. At the present time Pratt Pond is filled with salvaged logs, and it is expected that they will be sold and removed



during the next year. This tract of 808 acres consists entirely of forest land, much of it cut-over, but still having valuable stands of young soft and hardwood. Near the road passing Pratt Pond, and in the town of Mason are the ruins of the first starch factory built in New Hampshire about 150 years ago by the ancestors of Dr. Russell. This tract has been surveyed and type-mapped.

**BLACK MOUNTAIN ADDITION:** Eleven acres of forest land were purchased from Mrs. Delina Demers of Haverhill, New Hampshire, adjacent to the Black Mountain Reservation. The purpose of this acquisition was to secure for the department the right to build a diversion dam and ditch diverting a portion of the water from Lime Kiln Brook to the Camp Chipewas area for recreational purposes. This 11-acre tract lies adjacent to areas already acquired by the state, and consists mostly of hardwood growth. A right-of-way was reserved to Mrs. Demers across this lot to give access to other areas owned by her.

**SUGAR HILL ADDITION:** George B. Cavis of Bristol willed to the state ten acres of forest land adjacent to the Sugar Hill State Forest of 57 acres in that town. This tract is on the westerly slope of Sugar Hill, and is covered mostly with young hardwood growth.

**RANDOLPH SPRINGS:** Through cooperation with the State Highway Department, three acres of forest land in Randolph, including the famous Randolph Springs were purchased from the Thomas J. Malloy Estate of Gorham. These springs are located adjacent to the state highway, and have been used for many years as a picnic place by the public. An option was acquired from the Estate to purchase this property for \$200, the cost being equally shared by each department. It is expected that certain improvements will be made at this attractive spot.

**PLUMMER'S LEDGE:** George F. Plummer of Ashland made a gift of three acres of forest land on the so-called Buffalo Road in Wentworth. The purpose of the gift was to convey and to have protected for all time several pot holes of various sizes located high up on a shelf of ledge and at some distance from a branch of the Baker River. These pot holes are of unusual geological interest.

#### Conveyed by State

**PULPIT ROCK:** In the last biennial report of the Commission mention was made that it would be for the best interests of the state to re-convey to the donor the Pulpit Rock property in Bedford. This was considered necessary because of the damage by the 1938 hurricane to the timber about the Rock which spoiled this portion of the premises for scenic or recreational use. This tract of 247 acres was accordingly returned to the grantor, Harold J. Campbell of Manchester, by his payment of \$175, the cost of acquiring these lands.

**HUCKINS:** In June, 1934 the state received as a gift 1,458 acres in Freedom from the Ossipee Valley Land Company. Under a cooperative agreement the Forestry and Recreation Department was to hold title to the land, and the Fish and Game Department was to maintain a fish rearing pool for their use. A reservation in the deed provided that if this tract was not used continuously for a period of two years to rear and raise fish scientifically the whole area would revert to the grantors. In 1936 the Fish and Game Department decided that conditions were not suit-

able to warrant the expense of raising fish. The acreage of 1,458 acres is therefore taken from our records as the state has lost the rights to this property by said reversion.

### Summary

The following table shows state forests and reservations acquired and conveyed by the state during the years 1939 and 1940. During the biennium 861 acres were acquired, bringing the acreage to 43,080 acres. The Huckins and the Pulpit Rock tracts of 1,705 acres were returned. Surveys of the Connecticut Lakes area at Pittsburg showed a decrease of 370 acres. The total net decrease in acreage is 2,075, making the present area of the state forests and reservations 41,005 acres.

### Acquired by State:

Name	Location	Acreage	Year	How Acquired	Cost
Hyland Hill	Westmoreland	20	1939	Purchase	\$250.00
Endicott Rock	Laconia	1	1939	Made Land	
Pierce's Island	Chesterfield	5	1939	Gift	
Russell-Abbott	Mason-Wilton	808	1939	Gift & taxes	206.31
Black Mountain	Haverhill	11	1940	Purchase	100.00
Sugar Hill	Bristol	10	1940	Gift	
Randolph Springs	Randolph	3	1940	Purchase	100.00
Plummer's Ledge	Wentworth	3	1940	Gift	
Total Acquired		861		Total Cost	\$656.31

### Returned by State:

Huckins	Freedom	1,458	Revert to Grantor by terms of deed
Pulpit Rock	Bedford	247	Reconveyed to Grantor
Total Returned		1,705	

### Change in Acreage:

Connecticut Lakes	Pittsburg	370	Decrease	
Total Decrease	2,075		Last Reported	42,219
Total Acquired	861		Net Decrease	1,214
Net Decrease	1,214		Present Area	41,005

### TAX DELINQUENT LANDS

The problem of delinquent taxes has become very acute in many states during the past ten years. California, Oregon, Minnesota, Wisconsin, Michigan and other states have taken over large areas of depleted forest lands due to defaulted taxes and will restore them for future timber production under state ownership or supervision. During recent years the increase in tax title lands in New Hampshire is cause for much anxiety. Of the 36,000 acres reported in town ownership in 1938, about 21,000 acres were tax title lands. A questionnaire was sent out by the department to the 223 towns during the fall of 1940. Returns from 216 towns show that 78 report tax defaulted forest lands only. The tax collectors of these towns report 187 deeds due the towns having an acreage of 12,285 acres and approximate valuation of \$75,000. The selectmen report 422 deeds taken by the towns with an acreage of 25,000 acres, and a valuation of about \$150,000. Town tax delinquency totals 37,392 acres with a valuation of about \$225,000 as of December 31, 1940. These records indicate an increase of over 16,000 acres during the last two years.

Acreage of gifts and purchases of town forest lands, including water supply areas, amounts to more than 15,000 acres with a valuation of \$209,200. The latest returns indicate the towns hold title to 52,502 acres, with a valuation of about \$435,000. The following table shows the different classes of town ownership:

**Town Tax Defaulted Forest Lands**  
**January—1941**

	No.	No.	Acreage	Valuation	
Total towns in State	223				
Towns reporting	216				
Towns reporting gifts, purchases and tax defaulted forest lands	154				
Towns reporting tax defaulted forest land only	78				
Deeds due towns		187	12,285	\$74,939	
Deeds taken by towns		422	25,107	150,123	
Total		609		37,392	\$225,062

**Town Forest Lands by Gift and Purchase**

Gift	53	6,231	61,160	
Purchase	35	8,879	148,040	
Total			15,110	209,200
Grand Total			52,502	\$434,262

How much of this tax title acreage should remain in town ownership for forest and recreational purposes and what should be done with the balance are questions of growing importance. In some states these lands are taken over by the state if they better fit into their forest management programs.

As to the problem of tax delinquent forest lands, there is need for much painstaking study to work out a definite course for the towns and state to pursue. Some lands should be retained by the towns. Others should be sold if possible and returned to the tax list. Some forest areas which fit into the program of state forests and recreational areas should pass to state ownership. It is difficult to estimate the acreage which might accrue to the towns or state during the next five or ten years. Such lands should have the titles searched, be located on the ground, surveyed and type-mapped, and a plan of disposition and management worked out for each.

**Leases and Special Use Permits**

During the biennium the Governor and Council have authorized the Commission by its agent, the State Forester, to issue leases and special use permits for certain concessions and privileges on state forests and reservations. Many of these permits are annual with consideration of less than \$100; others for more than one year but not over five with greater consideration. The long term leases of special value are for concessions in Crawford and Franconia Notches.

The Governor and Council have also approved issuing special use permits for certain islands in lakes and ponds where there appears no doubt that the title belongs to the state. Many islands have been posted with the state property notices indicating that the public have a right to the islands for limited day use only.

**W. P. A. Cooperation**

The department desires to express its appreciation of the cooperation with the Works Progress Administration. Immediately after the September, 1938 hurricane special projects were quickly set up and approved permitting workers to assist in fire organization plans, drafting, mapping, and preparing reports. Other projects have been undertaken and completed furnishing valuable data, statistics, maps, charts and special information for the department. The sponsor's or state's share in this expense was 25 percent.

## Summary of the Post-Hurricane Situation on White Mountain National Forest

C. L. GRAHAM, *Forest Supervisor*

## Hazard Reduction

As a result of the hurricane of September 21, 1938, about 110,000 acres of the 708,657 acres comprising the White Mountain National Forest was so damaged by windthrow as to be classified as area of high fire hazard. This area, together with 30,000 to 40,000 acres of private land inside the National Forest protection boundary, presents a very unusual and serious forest fire control problem. Immediately after the hurricane the four CCC Camps then available for work on the National Forest started on the reduction of the hazard along roads and trails, and the repairing of telephone lines to fire lookout towers and fire guard stations. Their efforts were shortly thereafter supplemented by two additional CCC Camps assigned to the Forest for hazard reduction and similar work. In addition, Congress at its session during the winter of 1938 and 1939 made available through a special appropriation, funds for extensive hazard reduction work on the Forest as well as construction of fire control improvements and purchase of fire control equipment.

Since the hurricane, the hazard has been reduced along all of the roads and the more important fishing streams on the Forest; the sides of the 1,500 miles of foot trails on the Forest have been cleaned up of brush; and 500 miles of fire lines have been constructed to break up some of the larger areas of slash. The area covered with this type of fire-proofing work totals about 4,000 acres and represents the majority of the work that it is economically feasible to attempt.

Just prior to the hurricane, a complete detection study had been completed for the National Forest showing the number of lookout towers that were needed to supplement the towers already constructed, to provide what the Forest Service considered as adequate fire detection service. The special Congressional appropriation contemplated the carrying out of this detection plan, and since the hurricane new lookout towers have been constructed on 12 mountain peaks inside the Forest.

Inasmuch as it is not economically feasible to attempt to reduce all of the hazardous areas in remote sections of the White Mountains, it was agreed, during a conference with representatives of various state departments and interested private and semi-private organizations, to close some of the more hazardous sections of the Forest to all forms of use as a fire prevention measure. While the Forest Service has legal authority to close sections of the National Forest that are classified as areas of high fire hazard, and enforce that closure under the federal statutes, the state legislature recognized the need for such a regulation of use of high hazard areas and passed legislation to the effect that non-trespass in such closed areas could be enforced under state laws. This was very helpful in enforcing the closure on 90,000 acres of the National Forest that will remain closed to entry for several years to come. It has been necessary in only a few cases to take any legal action. Wherever people have innocently trespassed on closed areas, which are adequately signed, they have been given a warning before any legal action is taken, and it is interesting to note that, as an example of the good cooperation the general public gives to conservation agencies, no second offense is recorded.

### Forest Management

While the immediate fire hazard resulting from the hurricane is spectacularly important, it is overshadowed in the long run by the serious damage sustained by the present and future timber crops which furnish a reservoir of raw material for many of our local wood-using industries.



*Hazardous blow-down, White Mountain National Forest, before clean-up.*  
(Photo by U. S. Forest Service)

Estimates indicate that 200,000,000 board feet of merchantable sized timber alone was blown down on the National Forest. In addition to this there was an unestimated amount of damage to young growth as well as heavy breaking and cracking of larger trees that were left standing. The amount of damage in the latter case will be difficult to determine for many years, but it is realized that in many instances this damage will provide easy entry for insects and disease. The seriousness of the loss of this supply of raw material to local industries was immediately recognized after the hurricane, for most sales of standing timber in existence at the time of the hurricane were cancelled, with sales from that time on pointing toward the salvage of blow-down material. Of the 200,000,000 board feet of timber blown down, only about 80,000,000 board feet occurs in groups of sufficient size and accessibility to justify a logging operation. To date approximately 70,000,000 board feet of this timber has been sold. Due to the fact that the salvage period for this material has somewhat exceeded the initial conservative expectations, it is not unlikely that 10,000,000 or more will be sold before it has deteriorated to such an extent that it is no longer merchantable.

In addition to the 270 sales through which this 70,000,000 board feet of timber is being operated, approximately 3,000 cords have been given away to local residents through 250 free permits for use as fuelwood in their homes.

The section of New Hampshire represented by the White Mountain National Forest will continue for the next eight or ten years to experience the worst fire hazard situation that probably has ever existed in that area.



The spread of fire in blow-down timber is much more rapid than a spread under similar conditions in logging slash, and, in addition, its resistance to control because of the tangled character of the fuel is probably five times greater than that in logging slash. For this reason



*After clean-up operations upon area shown to the left.*  
(U. S. Forest Service)

it will be necessary for the thousands of people who use the National Forest each year to be unusually careful in their use of fire in order that the satisfactory record of fire occurrence experienced in the past may be continued.

During the spring of 1940 the headquarters of the White Mountain National Forest were moved from the Piscopo Building in Laconia to a new Forest Service Building constructed on North Main Street in Laconia. This building was dedicated on July 30 and provides adequate space for the staff of the White Mountain National Forest office of the Forest Supervisor, as well as storage facilities for motor equipment and the supply depot.



## RECREATION ADMINISTRATION

R. B. TOBEY



HIS report of the operation and maintenance of the state parks and reservations except Franconia Notch and Crawford Notch Reservations covers the calendar years 1939 and 1940. The following is a list of the areas administered by the department:

Bellamy State Park — *Dover*  
Cardigan State Reservation — *Orange*  
Cathedral Ledge State Reservation — *Conway*  
Clough State Reservation — *Weare*  
Endicott Rock State Park — *Laconia*  
Forest Lake State Park — *Dalton*  
Hampton State Beach — *Hampton*  
Kearsarge State Reservation  
    *Toll Gate — Warner*  
    *Winslow Site — Wilmot*  
*Milan Hill State Park — Milan*  
Monadnock State Reservation — *Jaffrey*  
Moose Brook State Park — *Gorham*  
Peterborough State Pool — *Peterborough*  
Wadleigh State Park — *Sutton*  
Wellington State Beach — *Bristol*  
Wentworth State Beach — *Wolfeboro*  
White Lake State Park — *Tamworth*

### Newly Supervised Areas

CARDIGAN STATE RESERVATION in Alexandria and Orange covers over 3,000 acres on the slopes of this mountain. In the western section, in the town of Orange, improvements had been made by the CCC providing an entrance road, a parking area and a small picnic ground near the foot of the West Side Trail. An old well was improved, a pump installed and a shelter house built over it. This area had been used by the public prior to 1939 but lack of supervision led to unsanitary and unsightly conditions. On June 15, 1939, a man was engaged to look after the area and to collect the service charges until the middle of October. During that period, over 400 cars carrying nearly 2,000 people came to picnic and hike. During 1940, over a similar period of time, nearly 600 cars brought over 2,500 people to the area. Besides attending to collection of fees, supervision of use and clean-up on the area, the Supervisor was able, as well, to provide fire wood, install toilets, improve the hiking trail and install directional signs. Picnic tables, waste barrels and first aid equipment were supplied. Thus an area was saved from becoming unsightly and undesirable and through supervision has since received increasing public use and appreciation.

KEARSARGE STATE RESERVATION — TOLL GATE AREA. This portion of the Kearsarge State Reservation is located in the north section of Warner on the southern slopes of Mt. Kearsarge. Under a legislative act of 1935, the CCC constructed 2½ miles of a toll road up the mountain by July, 1939. This program also provided a toll house, picnic area and parking area at the lower end of the road. Since the finished portion of the road could be used and picnicking provided, permission from the Governor and

Note: Three in italics are newly supervised in the past two years.

Council was obtained to open the area to public use in July, 1939. A man was engaged to supervise the area and to collect a toll of 25 cents per car. From the time of opening until the 15th of October, 891 cars brought over 3,900 people to use the road and to enjoy the extensive vistas, picnicking and hiking. A survey of use indicated that over 36 percent of the cars came from out-of-the-state and that cars with New Hampshire registration came from 50 different towns. The average round trip per car was 36 miles and each car carried an average of four persons. Information secured from nearly 500 parties disclosed that they had travelled a total of 16,000 miles in round trips to visit the area. During the similar period of 1940, 850 cars brought over 3,700 people to the area. Work is being continued by the CCC to extend the road and build picnic and parking areas near the so-called Rollins Shelter within a half mile of the summit.

MILAN STATE PARK in Milan has been developed by the CCC under the planning of the National Park Service. One of the most extensive views in the locality is from this hill which is also the site of a fire lookout station. A new entrance road and parking area were built as well as foot trails, a combination picnic shelter and latrine building, water and sewage systems, tent camp sites, fireplaces, picnic tables and a supervisor's house. In 1939, from the first of August to the middle of September, the area was supervised and service charges collected. During 1940, between June 15 and October 15, 756 cars brought 3,326 people. During the period in 1940 comparable to the previous year, 187 more cars came to the area. There were some who wished to camp as well as picnic and to provide for this, improvements have been made to the unfinished camp sites.

The net expense to the department for these three new areas for two seasons was \$1,200 including new equipment for the areas and completion of some unfinished work by the CCC. These three new areas opened to public use served nearly 20,000 visitors at a net cost of six cents for each visitor.

#### Public Use

It had become apparent by 1939 that to plan for future developments, more efficient operations and maintenance, it would be necessary to gather more facts about the use of the state parks and reservations. A survey was made during each of the past summer seasons in order to obtain this information. We wish to express our appreciation to the State Planning and Development Commission for their help and assistance in obtaining and interpreting data. The collectors at several areas were able to observe and tabulate such facts as the state registration of each car, the number of passengers and, by questioning, to determine the starting point of their trip. This information has since been tabulated and analyzed and it provides a better understanding of the use of the areas. It was thus indicated that over 64 percent of those using our areas were out-of-state people, though at each area this percentage varied (25 to 81 percent). The survey was carried out at several areas for an average time of three weeks per area or an accumulative total of 304 days; 6,900 cars and busses were checked as carrying an average of 4.4 people or a total of nearly 30,000 visitors. These cars traveled an estimated round trip of 33 miles going to and from these areas; a total of over 168,000 miles in all. Visitors to some areas came from as many as 60 different towns in New Hampshire during this period. By transferring this information to maps, it can

be indicated how important each area is to the people in the locality. The extent of the travel stimulated by these recreational areas indicates that expenditures for goods and services were undoubtedly made at communities nearby these areas and that a direct financial return was made to the state through the gasoline tax.



*Hampton Beach State Bathhouse, the largest of twelve operated by this Department. (Photo by Ellis)*

The collection of service charges at each area is reported on a daily basis. From these reports we can arrive more accurately at the estimated seasonal attendance than heretofore. An analysis of the day-to-day patronage has indicated the weekly and seasonal peak loads of attendance. We have thus learned that at some areas nearly 50 percent of the week's use occurs on Sunday. This should enable us to anticipate patronage peaks and adjust our personnel with economy in the future. The results of a tabulation of camping permits confirms an increasing interest in this form of recreation. The following table shows the combined camping data at the three major camp grounds:

	1938	1939	1940
Number of Parties .....	995	1,142	1,303
Number of Persons .....	4,166	4,470	4,961
Average Stay in Days .....	2.2	2.4	2.5
Number of States Represented .....	21	18	20
*Camper-Days .....	10,344	11,434	13,110

#### Expense and Income

Expenses were increased in 1939 by the addition of three new areas but still more because of extra repairs and services needed on account of hurricane damage to several areas. The total net cost added on account of new areas was \$732.90. The hazardous condition of the woods and trails after the blowdown required an extra patrolman each at Monadnock and Wellington Reservations. Extra cleanup and repair to damaged buildings was required at several areas adding to the general maintenance cost. At those areas severely damaged, there was also a falling-off of patronage which resulted in reducing income and larger net cost of operations. This was particularly noticeable at Monadnock Reservation and Wadleigh Park during 1939 but a favorable change was noted in 1940.

\*One person camping for one night is a camper-day. Example: Four persons camping four nights equals 16 camper-days.

During 1940 at Bellamy State Park, the operation costs were increased by an arrangement with the City of Dover through the Governor and Council. The baseball field was regraded to form a football field. About \$2,000 was spent to increase the capacity of the bleachers; one-half of this was provided by the City and one-half through an advance of this Department by the Governor and Council. The City obtained a five-year lease of the facilities for the football season and will pay the State ten percent of the general admission income. From this income for 1939, the Department has paid back over \$500 of the \$1,000 originally advanced.

Income for 1939 was \$1,379 greater than for 1938 and increased slightly in 1940. Nearly 50 percent of the total income for each season came from the service charges based on the parking of cars. This increased from \$9,503 in 1939 to \$10,381 in 1940. Income from camping amounted to about \$1,200 each for the two seasons; \$800 of this came from White Lake State Park which contains our largest camp ground. Income from forested areas damaged by the hurricane was reduced by loss of patronage in 1939. From those areas depending on bathing patronage, it decreased in 1940 on account of unfavorable weather conditions. Thus each of the two years received a temporary set-back as to income. We should expect that with changes in these conditions, income will proceed upward together with greater patronage.

Although income for 1940 was only \$625 greater than in 1939, the net cost of operations, maintenance and improvements was reduced in 1940 by \$3,361. The proportion of income to total operations, maintenance and improvement expenses was 71 percent in 1938, 57 percent in 1939 and 65 percent in 1940. Compared with 19 other states reporting for 1938, New Hampshire shows the second highest percentage of income to expenses. Our cost per visitor ( $2\frac{1}{2}$  cents for 1940) is considerably lower than in most states.



*Bathing beaches administered by the State provide safe and healthful recreation. (Photo by Ellis)*

STATE OF NEW HAMPSHIRE  
FORESTRY AND RECREATION DEPARTMENT  
OPERATION, MAINTENANCE AND IMPROVEMENT EXPENSES OF STATE RECREATION AREAS  
(Not including Administration, etc.)  
FOR THE PERIOD JANUARY 1 - DECEMBER 31, 1939

Area	No. of Personnel	Average Monthly Wage	Total Wages	Other Expenses	Total Maintenance Cost	Total Income	Net Cost	Estimated Attendance	Net Cost per Visitor
Bellamy Park	5	\$67.00	\$1,872.37	\$808.09	\$2,680.46	\$128.93	\$2,551.53	45,715	\$.056
Cardigan	1	60.00	194.00	41.15	35.40	109.75	125.40	2,225	.08
Cathedral Ledge	1	75.00	262.50	141.36	403.86	119.00	83.60	3,000	.08
Clough Reservation	3	73.00	681.23	262.97	944.20	2.05	401.81	5,000	.006
Endicott Rock	3	75.00	715.57	310.45	1,026.02	871.60	72.60	11,248	.078
Forest Lake Park	15	84.00	4,132.00	4,461.85	8,593.85	6,879.87	1,713.98	96,522	.016
Hampton Beach	1	75.00	321.30	303.25	624.55	222.75	401.80	4,221	.10
Kearsarge-Toll	1	75.00	344.17	81.56	425.73	532.70	106.97	10,249	.015
Kearsarge-Winslow	5	71.00	1,193.23	1,612.82	2,806.05	2,237.54	568.51	38,118	.015
Kingston-Lake	1	50.00	1,137.04	1,631.14	300.18	94.48	205.70	2,398	.086
Milan Hill	3	81.00	1,508.96	683.73	2,192.69	1,309.03	883.66	20,725	.041
Monadnock Reservation	5	57.00	1,020.34	646.79	1,667.13	273.85	1,393.28	5,600	.249
Moose Brook Park	4	71.00	782.60	997.79	1,780.49	223.55	1,554.84	14,176	.110
Peterborough Pool	3	78.00	639.31	409.10	1,048.41	158.73	889.68	3,967	.224
Wadleigh Park	3	80.00	1,090.88	1,495.72	2,586.60	1,773.01	809.59	34,255	.024
Wellington Res.	3	73.00	1,054.64	711.18	1,765.82	364.22	1,401.60	7,390	.19
Wentworth Park	4	73.00	1,137.33	535.86	1,673.19	1,414.25	258.94	20,641	.013
White Lake Park	4	73.00	1,137.33	535.86	1,673.19	1,414.25	258.94	20,641	.013
18 Area Totals	61	\$76.00	\$17,091.47	\$13,696.21	\$30,787.68	\$17,121.81	\$13,665.87	335,491	\$.04

FOR THE PERIOD JANUARY 1 - DECEMBER 31, 1940

Bellamy Park	5	\$69.00	\$1,571.82	\$246.19	\$1,818.01	\$150.41	\$1,667.60	44,391	\$.038
Cardigan Reservation	1	60.00	272.00	20.10	292.10	147.50	144.60	3,033	.048
Cathedral Ledge	1	75.00	257.95	135.20	393.15	74.70	188.20	3,500	.085
Clough Reservation	3	73.00	744.93	248.30	993.23	393.15	395.15	6,000	.066
Endicott Rock	3	73.00	596.85	37.52	634.37	413.60	181.52	10,642	.017
Forest Lake Park	12	85.00	4,327.32	4,087.29	8,454.61	7,109.41	220.77	9,044	.024
Hampton Beach	1	75.00	367.50	83.93	451.43	212.00	1,345.20	100,140	.013
Kearsarge-Toll	1	75.00	362.90	102.15	465.05	529.55	64.50	4,062	.049
Kearsarge-Winslow	5	75.00	1,458.30	1,520.29	2,978.59	2,182.84	795.75	39,322	.02
Kingston-Lake	1	50.00	1,217.76	1,217.76	2,435.52	198.68	124.75	3,226	.033
Milan Hill	3	81.00	1,739.64	463.78	2,203.42	1,547.56	655.86	25,521	.026
Monadnock Reservation	5	73.00	1,044.98	566.72	1,611.70	431.51	1,180.19	8,873	.156
Moose Brook Park	3	73.00	632.92	364.76	997.68	117.35	880.33	13,343	.08
Peterborough Pool	3	76.00	713.94	370.56	1,084.50	250.93	833.57	5,364	.155
Wadleigh Park	3	80.00	1,046.26	469.12	1,515.38	1,673.01	1,576.63	32,704	.159
Wellington Res.	3	76.00	982.03	794.12	1,776.15	395.28	1,380.87	8,670	.159
Wentworth Park	3	76.00	982.03	794.12	1,776.15	395.28	1,380.87	8,670	.159
White Lake Park	4	60.00	1,244.19	488.10	1,732.29	1,518.46	213.83	21,657	.01
18 Area Totals	57	\$76.64	\$17,965.20	\$10,194.59	\$28,159.79	\$17,746.30	\$10,413.49	350,229	\$.029



## Personnel and Services

The following table shows the number and classification of the seasonal personnel required to supervise, operate and maintain the state parks and reservations during the past two seasons:

	1939		1940	
	No. Em- ployed	Average Monthly Wage	No. Em- ployed	Average Monthly Wage
Supervisors .....	17	80	17	84
Collectors .....	15	74	15	74
Lifeguards .....	14	76	14	74
Attendants .....	13	71	11	73
General .....	7	76	7	89
Totals and Average Monthly Wages .....	66	76	64	79

The length of employment each season varied from 2½ to 11 months depending on the use of the area and the maintenance work required. Longer employment was at Monadnock Reservation, Jaffrey, where clean-up after the hurricane required work through the winter of 1939. Aside from the regular personnel, some extra services were required, such as plumber services in connection with major water supply repairs and trucking of gravel or rubbish removal. For the most part, however, the regular personnel attended to the seasonal opening and closing of buildings, seasonal services connected with water system, sewage system, electrical system, operation and storage of equipment and maintenance of the grounds and buildings during the summer season. In addition, they supervised and assisted public use of the area, providing information by the distribution of highway maps and other recreational literature. They provided treatment of minor injuries, removed injured persons from mountain trails, found persons lost in wooded areas and provided assistance to many bathers who were in serious difficulties. Through constant vigilance in matters of safety, no serious accident occurred to visitors on the areas; no drownings occurred and no forest fire was started.

When the season was at its height and the public use greatest, long hours were required of all the personnel. At many areas, especially where camp grounds were operated, this meant working 16 to 18 hours a day, seven days a week for several consecutive weeks. We appreciate the letters from visitors commending the services rendered by the personnel and here add our appreciation of their loyalty to the work we are trying to do.

Most of the supervisors have been formerly instructed in first aid methods and were supplied with kits and equipment. Before the 1940 season, the supervisors were gathered for a day to discuss various phases of their work including first aid, police duties, assistance to visitors, etc. All of the lifeguards had been instructed in the American Red Cross methods of water safety and were supplied with the necessary equipment. As a further precaution, instructions were given to each lifeguard at his beach in the early summer of 1940. He received advice as to the use and placement of water safety equipment at his bathing area. During the season, in addition to their regular duties, most of the lifeguards held public classes in swimming and lifesaving. The age range in swimming classes was from seven to seventy years and the total number enrolled in all these classes were several hundred persons. Life-saving instructions were carried out under the methods approved by the American Red Cross and scores of individuals were regarded by this organization as completing their required tests. In the past two years, several water pageants



were arranged through cooperation of the park personnel, public, and the American Red Cross. It is likely that the above services account for greater interest in and use of these state parks and reservations.

By legislative approval, the maintenance of the entrance roads to several parks and reservations is now attended to by the State Highway Department. The aid of the CCC on recreational areas since the hurricane has been limited. Where it has been possible to carry out work, this department has cooperated with both the Department of Interior and Department of Agriculture aiding with plans for the development of recreational facilities.

At Bear Brook Demonstration Area, Allenstown, which is federally owned, a picnic area, bathing beach, bathhouse and parking area are being developed. This work is carried out by the CCC through plans of the National Park Service. The legislature of 1939 appropriated \$3,000 which has been used to participate in the construction of the bathhouse. It is expected that this area will be leased to the State to operate in the season of 1941.

Besides the CCC activities at the Bear Brook Reservation, the WPA completed the second organized camp project at Spruce Pond, which was placed in operation by the National Park Service during the 1939 season. They widened and surfaced the  $1\frac{1}{4}$  miles of park road into the Spruce Pond camp and  $1\frac{1}{2}$  miles of road to Beaver Pond, preparatory to the later construction of additional organized camps. They also salvaged  $1\frac{1}{4}$  million feet of down timber and other products on the premises for use by the National Park Service. Fire hazard reduction was completed on 400 acres within the Reservation where this work was necessary.

Information regarding the state's recreational areas has been provided by this department at conferences, meetings and fairs; through literature, maps and moving pictures. In cooperation with other agencies, notably the Planning and Development Commission and the White Mountain National Forest, a map "Forest Recreation" was issued in 1939. This provided public information in regard to changes in hiking conditions and the use of the forest made necessary by the blow-down of 1938. A booklet "Public Recreational Areas" (now out of print) was published by the Planning and Development Commission in 1939 and provided information about all of the areas operated by this department as well as other public facilities in the state.

## FOREST FIRE CONTROL

E. J. COUTURE



THE hurricane of September 21, 1938 was preceded by a ten day period of rainfall during which a precipitation of 9.49 inches was officially recorded at Concord. The resultant damage from wind and flood and the immediate work of rehabilitation occupied the time and efforts of all agencies, public and private. Forest fire service structures, trails and telephone lines were temporarily out of commission and it was fortunate that the hazard of forest fires was at the time non-existent. The danger ahead however was fully recognized and during October public concern for assurance of protection was very real throughout the hurricane region of New England. Massachusetts and Connecticut closed their woodlands almost immediately for a considerable period. The Governor's closure proclamation was made effective in New Hampshire for the southwestern counties on October 7th, extended to the entire state on October 14th, and was finally lifted on October 24th. Actual fire danger during this period was less real than imaginary although several mysterious fires were started in Franconia Notch which required fire and police patrol and investigation during this period. No fires occurred in December.

### Organization and Personnel

During the winter and early spring of 1939 fire planning for the fire season ahead as well as organizing for the timber salvage and hazard reduction work with Federal agencies engaged the attention of the Department. Even before Federal funds were actually available by action of Congress the U. S. Forest Service came into the stricken regions of the State to aid with man power and equipment. Seven Federal districts were set up with main headquarters at Manchester and district headquarters at Nashua, Concord, Keene, Claremont, Lebanon and later at Laconia and Lancaster. Planning was worked out in cooperation with the department and included the use of all Federal facilities upon call of authorized State fire agents. These facilities consisted of the personnel and fire equipment of all CCC Camps, the crews of WPA and of five so-called D. A. Camps of 50 men each, built and operated at strategic places within the hurricane area, and various commuting crews employed by the Federal emergency organization.

No additional state funds were available on account of the hurricane until July 1, 1939. The balance of \$10,000 in the Federal Clarke-McNary state fund was used for strengthening the organization and personnel of the department and for equipment and materials needed before July first.

The number of state fire districts was increased from seven to nine. The old southern district, so-called, included all of Cheshire and most of Hillsborough and Rockingham Counties, as well as a few Sullivan County towns, and was sub-divided into three districts. Charles F. Young, erstwhile Chief of the whole area, retained the Hillsborough County portion of his old district and Merton A. Webber, former Warden

of Windham, was employed as Chief of the Rockingham County towns heretofore in the undivided territory. Joint headquarters for Messrs. Young and Webber were established in Nashua, office space being furnished without charge by Federal timber salvage and fire hazard reduction project authorities. The Cheshire and Sullivan County area formerly supervised by Mr. Young was transferred to Federal Blister Rust Agent F. J. Baker, with headquarters in Keene as a new District Fire Chief. The districts under Blister Rust Agents Thomas J. King at Concord, George F. Richardson, Jr., at Lebanon, Thomas L. Kane at Littleton and S. H. Boomer at North Conway remained substantially the same. The Plymouth district under Elmer E. Woodbury was merged into the surrounding districts following his death in 1940. The two Coos County districts under C. S. Herr, Lancaster, and J. W. Keenan, Berlin, remained unchanged except that during a period of illness of the former, Mr. Keenan took over both districts.

Four clerk dispatchers were employed in the spring of 1939, one working at the headquarters of the two southern districts at Nashua and one each at the district headquarters at Keene, Lebanon and Concord. In all state fire districts surrounding the National Forest, the Federal district rangers were authorized to place their clerk dispatchers at the disposal of state district fire chiefs to receive reports of fires and dispatch help when needed.

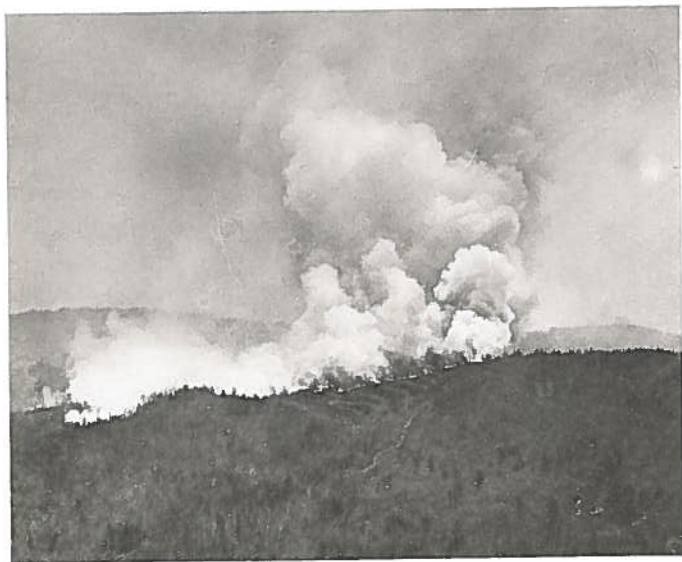
The State Forester's Administrative Assistant for fire control at the Concord office was given increased responsibility in the task of coordinating the district and town organizations and planning for the equipment needed and subsequently provided for by the legislature for the towns and department. When major fires occurred involving more than one district and requiring outside help, he served as State Dispatching Agent for the districts and the Federal agencies in bringing man power and equipment quickly to the scene of these fires.

#### **Fire Planning to Meet the Hurricane Emergency**

In December of 1938 a state-wide conference was called by this department to coordinate Federal, State and Town participation in meeting the problem of emergency fire control. This conference brought together all Federal hazard reduction staff and supervisors, members of the State Forestry staff and district fire chiefs, representatives of the National Forest, Extension Service, Society and others representing lumbermen, land owners and state committees. Out of this conference a program of both fire prevention and suppression was determined in order that the various forces available should function together without duplication or confusion.

Having a force of Federally trained supervisors and crews available it was recognized that the state fire organization must perform its functions as legally set up with the wardens responsible for prevention and suppression of forest fires in their respective towns but strengthened by Federal man power placed at state disposal. Each warden with his deputies is required to respond to every fire and summon the necessary help to control it. In the past CCC help had been allowable only as a second line of defense and not to displace the orderly use of local town

crews. The emergency plans authorized state district chiefs to call CCC or other Federal help for any fire which could not be controlled by the warden with his local help. Close coordination between the district chief and all town wardens in his district was fundamental. A clerk-dispatcher in the office of the district chief in the most hazardous districts



*Wind-blown timber created hazardous conditions throughout the woodlands of the State. (Photo by Manchester Union)*

was regarded as necessary. Telephone reports of all important fires or any fires in hazardous localities were made both by the lookout watchmen and the wardens to the district chief in order for him to dispatch help with full knowledge of existing fire conditions throughout his district. Complete information about man power, equipment and needed supervision in each town as well as suitable maps and knowledge of hazard conditions, water supplies, transportation and means of access were necessary. The planned program provided for ultimate control in dire emergency through the State Forester's office in Concord by dispatching men and equipment and all Federal and State facilities from one district to another and if necessary calling upon the Boston headquarters for assistance from outside the state.

Subsequent fire planning with all the towns of the state by fire districts involved listing the names, locations and telephone numbers of each warden, deputy and specialized assistants and the names of available men for immediate first line defense, a detailed inventory of power and hand tool equipment in each town, transportation facilities, sources of food and supplies, facilities available for use in other towns, etc. All this information was assembled in each district chief's office for control and dispatching purposes. In carrying out this program the district chiefs

and Federal agents loaned to the department visited all the towns of the state where it was necessary to complete the information.

The summary of the first town inventory showed for each district three classes, namely, towns capable of handling their own fire problems and giving outside assistance; those capable of handling their own fire problems with no outside assistance needed; and those incapable of handling their own fires without outside assistance except under conditions of low fire hazard. This first survey revealed that about 66 towns in the state had insufficient man power and equipment to take care of their own fire problems. It also showed that 64 towns or 27 percent were inadequately equipped. The town tool supply as of December, 1938 indicated approximately 77 portable power units in the State, 1,737 knapsack pumps, 6,800 hand tools and 277 fire trucks, the last being of primary importance for building fires.

The need for additional tool equipment especially small tools and knapsack pumps in most towns and the urgency of warden training in methods of fighting slash fires, procedure in supervising men and directing crews at large fires were of recognized importance. The training of wardens and volunteer key men by groups of towns in each district was undertaken although much of this work had to be postponed since Federal agents assisting were engaged in hazard reduction work and in training CCC and other crews employed. Later in 1939 and 1940 volunteer crews in many different towns were assembled by wardens to receive this special training and the benefit of demonstrations carried out by trained CCC and other crews showing the proposed use of hand tools in trenching and fire line construction and the proper use of power equipment. The services of Gerald Hight, formerly with the Federal Emergency organization, were employed beginning July, 1940 to assist in carrying forward the fire organization and training program.

#### **Special Fire Appropriation — 1939**

The legislature in session during fire preparations of 1939 evidenced interest in all phases of protection as well as in matters relating to timber salvage. It seemed advisable to support the usual appropriation for forest fire control work and provide a special appropriation of \$100,000 for two years to take care of extra costs for fire suppression, additional personnel for the district chiefs, fire lookouts, patrol, state power equipment and tool supplies to be sold to the towns on a 50-50 basis, and this program was approved by the legislature. Of the special appropriation of \$100,000, \$30,000 was made available only for the payment of fire bills to towns over and above the regular appropriation of \$7,500. The balance of \$70,000 was made available according to the approved budget for administrative expenses and fire tool equipment.

As a result of the 1939 March town meetings, \$181,883 were appropriated by the towns for rehabilitation and fire control work.

Following is a summary of expenditures of state funds and balances remaining at the end of the biennial period from the special appropriation of \$100,000 to the Department:



## Special Emergency Fire Control — Chapter 254, Laws of 1939

July 1, 1939-June 30, 1941: \$100,000.00

<i>Item</i>	<i>Expenditures</i> 7/1/39-6/30/40
State Fire Truck, Pumps, Hose and Tools .....	\$6,876.17
Town Fire Tools .....	13,437.64
Town Fire Bills .....	8,342.81
Auxiliary Lookout Stations .....	4,045.15
Patrol — State Reservations .....	221.47
Training Wardens and Crews .....	475.49
District Chief — Rockingham .....	2,467.98
District Chief — Cheshire .....	732.36
District Dispatchers .....	5,372.00
Clerk — Concord Office .....	665.30
Extra Administrative Expense .....	1,218.75
	<hr/>
Total Expenditures .....	\$43,855.66
Unexpended Balance .....	56,144.34
	<hr/>
Total Appropriation .....	\$100,000.00

**Forest Fire Tools to Towns**

The procurement by our department of forest fire fighting tools for 50-50 resale to towns is a cooperative activity of many years' standing and the additional funds made available by the Legislature in 1939 made possible for the first time a program fully equal to the need for new equipment in the towns.

Whereas former annual appropriations had been \$500.00 net, we were enabled to use more than \$15,000 for the acquisition of tools during the fiscal year 1940, plus the amounts paid by towns as their share of the cost. Heretofore, these town contributions had been deposited in the general treasury.

The great need for tools and for this method of state cooperation is best illustrated by comparative statistics of 1939 and 1940. We were able to accept and fill only 22 town orders in 1939, receiving \$426.78 for 196 units of equipment compared with 274 town orders in 1940, town contributions amounting to \$8,847.21, and total tools distributed numbering 7,600 pieces.

Tools of extra grade and special design are purchased in large quantities at very favorable terms. The resultant savings are great and this, plus the dollar-for-dollar state cooperation, makes available to towns good tools at extremely low figures.

**State Owned Fire Fighting Equipment**

During the biennium, the department acquired four portable power pumping units consisting of light-weight but efficient pumpers with a 2,500 foot complement of 1½ inch hose and necessary accessories. These units were located in Colebrook, Bristol, Milford and Portsmouth, bringing the total of such state-owned units to 17. Others are in Errol, Milan, Whitefield, Haverhill, Conway, Rumney, Lebanon, Boscawen (2), Epsom, Exeter, Hudson and Keene.

These units are used many times each year in a way to bolster first-line town equipment. They are operated with the cooperation of the towns in which they are located and the arrangement makes for economical protection of a kind which is highly valued in the areas concerned.



**Fire Record Fiscal Years 1939 and 1940**

Compared with the average of the preceding 29 years, both 1939 and 1940 were more favorable than the average in areas burned over and damages. The number of fires each of the two years however exceeded the average by 32 fires in 1939 and by as many as 313 fires in 1940. In every other respect 1940 was a much more favorable year than 1939.

During the fall before and after the hurricane of September, 1938 there were no serious fires. The following season of 1939 there were 102 days of fire danger rated as Class 3 and 27 other days rated as Class 4 days of extraordinary fire danger. In 1940 there were 52 Class 3 days and only 7 Class 4 days.

Fire occurrence both years was pronounced during the spring periods of April to June, extending well into July of 1939. It was during this period of 1939 that the three most severe and costly fires of the biennium occurred in connection with lumbering in difficult and remote areas of hurricane blowdown. These were the Sharon, Lyme-Dorchester and Lyman fires in successive months of May, June and July. These three fires burned 3,070 acres and cost the towns and state \$11,662.13 to control, not including cost for services of federal cooperating agencies.

The two major causes of fires, area burned and damages were smoking and brush burning. Lumbering while causing only 2.6 percent of the number of fires was the third principal factor in area burned and damages. Smoking in and around logging operations seemed to be the cause of most fires in remote territory.

The following seven tables show the number of fires by months; totals and averages for 31 years; summary of averages; complete fire record by counties; railroad fires; number of fires, areas burned and damage by causes; and a combined state summary.

**Number of Fires by Months**  
(Exclusive of Railroad Fires)

<i>FISCAL YEAR</i> <i>Ending June 30, 1939</i>		<i>FISCAL YEAR</i> <i>Ending June 30, 1940</i>	
July, 1938 .....	10	July, 1939 .....	124
August, 1938 .....	6	August, 1939 .....	41
September, 1938 .....	8	September, 1939 .....	45
October, 1938 .....	21	October, 1939 .....	56
November, 1938 .....	7	November, 1939 .....	92
December, 1938 .....	0	December, 1939 .....	8
January, 1939 .....	1	January, 1940 .....	0
February, 1939 .....	0	February, 1940 .....	0
March, 1939 .....	3	March, 1940 .....	0
April, 1939 .....	68	April, 1940 .....	156
May, 1939 .....	220	May, 1940 .....	137
June, 1939 .....	66	June, 1940 .....	32
<b>Totals .....</b>	<b>410</b>	<b>Totals .....</b>	<b>691</b>

**Forest Fire Record for Thirty-one Years**  
(Exclusive of Railroad Fires)

<i>Year</i>	<i>No. Fires</i>	<i>Area Burned</i>	<i>Average Area Burned Per Fire</i>	<i>Damage</i>	<i>Average Damage Per Fire</i>
1910	272	9,038A	33.2A	\$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	367	2,011	5.2	12,548.00	32.42
1937	433	2,906	6.7	13,451.00	31.05
1938	488	4,400	9.0	20,524.00	42.06
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29 yrs.	10,954	230,862A		1,706,155.00	
1939	410	5,080	12.4	32,307.00	78.80
1940	691	2,069	3.0	23,827.00	34.48
31 yrs.	12,055	238,011A		1,762,289.00	

**Summary of Averages**

<i>Average</i>	<i>29 Years</i>	<i>1939</i>	<i>1940</i>	<i>31 Years</i>
Fires Per Year	378	410	691	389
Area Per Year	7,961	5,080	2,069	7,678
Damage Per Year	\$58,832.93	\$32,307.00	\$23,827.00	\$56,848.03
Area Per Fire	21.1	12.4	3.0	19.7
Damage Per Fire	\$155.75	\$78.80	\$34.48	\$146.19

Fire Record For Fiscal Years 1939 and 1940  
(Exclusive of Railroad Fires)

County	Year	Number of Fires	Acres Burned	Average Area Per Fire In Acres	Total Damage	Average Damage Per Fire	Total Cost of Fighting	Average Cost Fighting Per Fire
Belknap	1939	30	140	4.7	\$619.00	\$20.63	\$454.90	\$15.16
	1940	40	117	2.9	2,300.00	57.50	596.94	14.97
	1939	26	521	20.0	859.00	33.04	1,870.65	71.95
	1940	27	86	3.2	1,232.00	45.63	680.30	25.20
Cheshire	1939	37	655	17.7	3,451.00	93.27	4,233.98	114.43
	1940	68	191	2.8	1,170.00	17.21	2,861.54	42.08
Coos	1939	7	27	3.9	27.00	3.86	88.16	12.59
	1940	19	80	4.2	2,917.00	153.53	879.66	46.30
Grafton	1939	31	846	27.3	7,100.00	229.03	7,321.30	236.17
	1940	56	267	4.8	3,133.00	55.95	2,366.07	42.25
Hillsborough	1939	108	2,161	20.0	16,237.00	150.34	8,581.25	79.46
	1940	145	237	1.6	948.00	6.54	3,888.53	26.82
Merrimack	1939	47	367	7.7	2,655.00	56.49	2,675.99	56.94
	1940	100	407	4.1	3,599.00	35.99	1,840.68	18.41
Rockingham	1939	85	277	3.2	803.00	9.45	819.97	9.65
	1940	165	431	2.6	4,454.00	26.99	2,422.40	14.68
Strafford	1939	23	80	3.5	514.00	22.35	389.39	16.93
	1940	29	115	3.9	3,596.00	124.00	835.06	28.80
Sullivan	1939	16	12	.8	42.00	2.63	248.47	15.53
	1940	42	138	3.3	478.00	11.38	1,346.20	32.05
State Totals	1939	410	5,080	12.4	32,307.00	78.80	26,684.06	65.08
State Totals	1940	691	2,069	3.0	23,827.00	34.48	17,719.38	25.64

## Railroad Fire Record For Fiscal Years 1939 and 1940

Year	No. of Fires	Total Area Burned	Average Area Per Fire	Total Damage	Average Damage Per Fire
1939	23	341	15	\$1,972.00	\$85.74
1940	50	285	5.7	\$1,529.00	\$30.58

## Total Number of Forest Fires, Area and Damage by Causes For Fiscal Years 1939 and 1940

CAUSES	Percent Total Number of Fires	Percent Total Area Burned	Percent Total Damage Causes
Railroads	6.2	8.1	5.9
Smokers	43.3	45.6	39.0
Burning Brush	24.1	15.2	21.4
Miscellaneous	10.4	2.3	1.8
Lumbering	2.6	14.8	18.9
Incendiary	3.9	8.4	2.9
Lightning	3.5	2.1	1.3
Camp Fires	2.6	.5	.4
Unknown	3.4	3.	8.4
Totals	100.0	100.0	100.0

Combined Forest Fire Record For Fiscal Years 1939 and 1940  
All agencies reporting

Year	Town	Railroad	White Mountain National Forest	Bear Brook Recreational Demonstration Area	Total
NUMBER OF FIRES					
1939	410	23	7	1	441
1940	691	50	8	1	750
Total	1,101	73	15	2	1,191
AREA BURNED					
1939	5,080	341	30	.25	5,451.25
1940	2,069	285	20	.60	2,374.6
Total	7,149	626	50	.85	8,825.85
DAMAGE					
1939	\$32,307.00	\$1,972.00	\$1.00	0.00	\$34,280.00
1940	\$23,827.00	\$1,529.00	\$9.00	\$4.00	\$25,369.00
Total	\$56,134.00	\$3,501.00	\$10.00	\$4.00	\$59,649.00

The following table gives the date of occurrence, comparative size, cost and damage of the largest fires of the past 20 years—1921 to 1940 inclusive:

Comparative Size, Cost and Damage of Large Fires in New Hampshire  
1921 to 1940  
(Walter Brown)

Location of Fire	Date	Size-Acres	Cost	Damage
Pittsburg	5/21/21	2,000	\$27,297.00	\$17,500.00
Waterville (Beebe River)	7/12/23	2,000	5,506.00	20,000.00
Merrimack-Bedford	5/3/36	700	717.00	9,050.00
Hudson-Pelham	5/8/26	2,300	1,272.00	70,200.00
Exeter-Newfields	5/8/26	1,000	1,300.00	9,700.00
Chesterfield-Hinsdale	4/12/27	1,600	1,149.00	5,500.00
Concord	5/14/28	1,100	105.00	1,100.00
Chesterfield-Hinsdale	5/11/30	2,000	1,436.00	2,020.00
Hollis-Milford	4/14/30	1,600	1,103.00	8,300.00
Walpole-Langdon	4/12/30	1,400	108.00	690.00
Westmoreland	5/6/30	1,050	262.00	4,400.00
Merrinack	5/7/33	1,800	1,144.00	30,500.00
Hooksett	5/16/33	1,500	1,239.00	3,000.00
Hooksett	4/28/38	1,540	1,589.00	3,700.00
Brookline	4/27/38	740	1,107.00	1,950.00
Sharon	5/11/39	1,650	5,747.00	13,800.00
Troy-Fitzwilliam	5/16/39	442	2,671.00	2,300.00
Lyme-Dorchester	6/21/39	522	5,402.00	5,240.00

**Portable Saw Mill Operations**

The number of portable saw mills registered and operated in the state increased from 207 in 1938 to 306 in 1939, chiefly on account of hurricane salvage. This is the largest number of mills recorded any year since registration was first required by law in 1925 and is over 50 percent greater than the yearly average. Many of these mills were contract mills sawing government purchased logs into square edged lumber, involving the burning of slabs and edgings as waste where the mills were powered by gas. Since open burning of mill waste creates a new fire hazard at mills located near woodlands, particularly in slash areas, new protection problems have arisen and the use of enclosed metal incinerators has become a necessity. In 1940 the number of mills declined to 263 as the salvaging of the bulk of scattered white pine timber was by then completed. Government contract mills sawing from ponds increased during the year.

Following is a tabulation of the registration and permits of portable mill operations from 1925 to 1940 inclusive. Each mill is registered for the calendar year. The number of permits indicates the changes in location of the mills registered.

**Tabulation Showing Registration of Portable Saw Mills**

<i>Year</i>	<i>Total No. Mills Registered</i>	<i>Power Used</i>		<i>Total Number of Permits</i>	<i>Number of Permits</i>	
		<i>Steam</i>	<i>Gas &amp; Others</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
16 year average	202	99	103	361	131	230

\*Law in effect from July 1, 1925.

**Miscellaneous**

New laws enacted by the 1939 legislature authorized entry on privately owned land for fire hazard reduction work, made trespassing in the White Mountain National Forest an offense which could be prosecuted in state courts and authorized wardens and deputy wardens to order the closing of roads and highways where traffic threatened to interfere with fire control. Efforts made to regulate the kindling of fires out of doors during periods of woods closure by proclamation and legislation to require portable saw mills to be equipped with fire fighting apparatus were not approved.

Violators of the forest fire laws are difficult to apprehend. State police, conservation officers and National Forest officers rendered substantial aid to our wardens and district chiefs particularly during periods of woods closure and in investigating fires of suspected incendiary origin. Town

authorities are responsible under the law to recover costs of fire suppression from persons responsible for the fires, especially in cases of brush burning without permit or when permit fires escape from control and warden assistance is required. During 1939 there were 232 fire law offenses charged, of which 185 were settled by the parties responsible paying the cost. The balance were not pressed by town authorities and therefore became a charge against the town since the state does not reimburse towns for such fire costs. In 1940 there were 163 violations requiring settlement of cost by the parties responsible. Of these, 157 were settled by the parties responsible and the towns paid the cost of the balance. Special efforts are made by the district fire chiefs to work with town authorities to effect a more complete settlement of costs by parties responsible. Additional legislation in this regard may eventually become necessary.

Assistance in fire prevention was inaugurated in 1940 in cooperation with the State Extension Service through an organization of 4-H Junior Forest Rangers throughout the state. A few more than 1,000 boys were finally enrolled in groups under sponsorship by club leaders, town wardens and others for general or specific duties. The department in cooperation with the State Club Leader prepared a manual for the use of the boys and supplied distinctive arm bands and also badges for patrol leaders. Many useful educational programs in fire prevention were carried out and it is hoped that another year the enrollment of junior forest rangers may be increased to at least 2,000. The actual fighting of forest fires has not been a part of their programs.

The department has adopted a state-wide map gridding system for precision in locating areas on U. S. G. S. quadrangle maps. Each map sheet is divided into nine five minute blocks and each block into 25 one minute sections, all clearly designated and keyed to adjacent quadrangles. Use of these grid maps by lookout watchmen and all other members of the fire organization makes possible more accurate understanding of fire locations as reported by telephone. The system will be put into operation by districts as the necessary maps can be prepared.

#### **Lookout Station Construction and Repairs**

Work under this heading has for many years been under the supervision of W. H. Tripp. During the biennial period several changes and additions were made in our lookout service.

Three of the stations previously operated by this department and located within the White Mountain National Forest have been transferred to the National Forest Service for future operation. These stations are Black Mountain, Benton; Cabot Mountain, Lancaster; and Stinson Mountain, Rumney. Following the hurricane Federal funds were made available by the New England Forest Emergency for the establishment of five new stations and the following locations were selected: Craney Hill, Henniker; Warner Hill, Derry; Miller Park, Peterborough; Smart's Mountain, Lyme; and Sam's Hill, Charlestown. With the assistance of the National Park Service a new station was erected on Bear Hill within the Bear Brook Reservation in Allenstown.



The station at Sugar Loaf in Stratford, not maintained since 1930, has again been placed in service.

The last report listed twenty-seven stations in operation. With the transfer of three, the establishment of six new stations and the reopening of one, this report lists thirty-one operated by this department in 1940.

Two stations, Crotched in Francestown, and Croydon, destroyed by the hurricane were reconstructed.

Repair of fire towers, watchmen cabins and telephone lines and the reconstruction of some lines due to hurricane damage were carried out during both seasons. Replacement of parallel pair covered wire, used to provide immediate service in 1939, by No. 12 copper weld or galvanized wire on poles and trees was part of the later task. Poles have been doweled into the ledges for greater security on some exposed upper slopes. A single wire grounded line six miles long was replaced by a metallic circuit in order to make Sugar Loaf serviceable for use. This work was done by a crew from the Lancaster NEFE district. New turn buckles were placed on guy wires at 26 stations. New map stands and hand telephone sets were placed at six old and six new stations.

During 1940 the observation rooms of older towers at Cardigan, Belknap, Blue Job and Pawtuckaway were rebuilt and the small observation room at Miller Park replaced by a standard 10x10 room. A garage was built at Crotched. In 17 observation rooms better insulation has been obtained by installation of wall-board or sheathed interiors. New sliding map stands have been placed in 12 towers and one at the observation summit for the Tramway on Cannon Mountain. Painting and minor repairs at 23 stations have been done for the towers, cabins and telephone lines.

The following table gives a list of state operated lookout stations for 1939 and 1940 and the number of smokes discovered, fires reported to the wardens, and the visitors to the stations. These figures are high compared with the average of preceding years and indicate the ever increasing danger of fire in and around our woodlands and the need for utmost control. The number of visitors to the stations, nearly 230,000 during the two seasons, is the largest number ever recorded.

## Fire Lookout Station Statistics

Name of Station	Number of Smokes Discovered		Number of Fires Reported		Number of Visitors Registered	
	1939	1940	1939	1940	1939	1940
Agassiz .....	16	29	16	22	10,500†	12,700†
Bear Hill* .....	52	191	41	75	409	2,184
Belknap .....	203	81	21	40	3,157	3,118
Blue Job .....	57	65	32	13	1,101	1,276
Cardigan .....	258	423	126	82	2,660	3,339
Craney Hill .....	135	84	25	11	1,246	1,053
Crotched .....	100	184	10	24	1,608	1,920
Croydon .....	72	66	65	48	120	158
Deer .....	4	8	1	0	88	123
Federal Hill .....	211	189	127	62	868	968
Great Hill .....	85	211	41	25	799	700
Green .....	94	39	32	15	1,459	1,784
Hyland Hill .....	182	454	47	42	375	323
Jeremy Hill .....	339	300	124	63	1,985	1,594
Kearsarge .....	117	71	68	22	8,453	8,817
Magalloway .....	54	13	3	1	49	34
Milan Hill .....	49	29	3	1	2,843	4,440
Miller Park .....	131	353	29	107	22,741	24,111
Monadnock .....	168	1,005	166	109	27,304	36,901
Oak Hill .....	94	164	39	48	530	402
Pawtuckaway .....	259	167	74	37	2,867	5,638
Pitcher .....	56	47	20	8	1,668	1,603
Red Hill .....	32	300	18	34	2,075	2,204
Rock Rimmon .....	396	584	135	135	626	887
Sam's Hill .....	360	172	42	31	492	362
Signal .....	17	9	12	2	92	29
Smart's Mt.** .....	23	130	17	35	243	244
Stinson*** .....	14	.....	13	.....	1,168	.....
Stratham Hill .....	323	911	38	175	4,088	3,650
Sugarloaf .....	.....	9	.....	5	.....	2
Uncanoonuc .....	399	247	141	75	1,713	2,894
Warner Hill .....	116	245	88	131	588	619
Totals .....	4,418	6,780	1,614	1,478	103,915	126,077

†Estimated

\*Service started August, 1939

\*\*Service started July, 1939

\*\*\*Not in operation by State 1940

## STATE FOREST NURSERY

L. N. WATSON



THE State Forest Nursery has continued to function under the same policies and carry on the same lines of work as in previous years. Trees for growing forest products have been grown and sold at cost to individuals and delivered free of charge at shipping points for planting on state, county and municipal lands. Trees have also been given free to members of boys and girls educational clubs between the ages of 9 and 21. Assistance to other branches of the department in handling fire equipment and delivering supplies to recreational areas has been maintained; also assistance to the State Highway Department in growing stock for roadside beautification work.

Trees were available to all municipalities throughout the state for reforestation planting on their municipal areas. Thirteen cities and towns took advantage of this offer and planted a total of 284,500 trees as follows: Manchester 182,000, Claremont, 33,000, Hillsboro 21,000, Walpole 13,000, Keene 10,000, Danville 7,000, Haverhill 5,000, Antrim 4,500, Charlestown 3,000, Dover 2,000, Durham 2,000, Newmarket 1,000, and Wilton 1,000.

In the educational groups a maximum of 500 trees were allowed to members between the ages of 9 and 16 and a maximum of 1,000 trees to members from 16 to 21 years of age.

The 4-H Clubs planted the largest number of trees among these groups with a total of 233,375 for the whole state. These were divided among all ten counties as follows: Hillsborough 84,975, Rockingham 46,400, Merrimack 30,850, Coos 26,000, Cheshire 20,000, Strafford 11,900, Belknap 10,000, Grafton 9,250, Carroll 9,000, and Sullivan 5,000.

Smith-Hughes or agricultural high schools and academies received a total of 95,775 trees divided among 13 schools in 8 counties as follows: Colebrook Academy 18,500, Alton High 14,050, Austin Cate Academy 11,500, Walpole High 11,100, Raymond High 10,825, Vilas High 10,350, Thayer High 10,000, New Boston High 2,800, Coe-Brown Academy 2,300, Orford High 1,500, Weare High 1,350, Quimby School 1,000, and Pinkerton Academy 500.

The Nursery has served as a receiving station for several years for fire fighting equipment and tools purchased by the department in wholesale amounts for resale in small quantities to cities and towns throughout the state. The amount of tools handled was comparatively small until the winter of 1938 and 1939 when the situation following the hurricane made it necessary for the state and all municipalities to equip themselves with more and better fire fighting equipment. Since then, 16 different items totaling 14,729 tools and pieces of equipment have been received at the Nursery. Of these, 7,945 were sold and have been reshipped in 275 orders to cities and towns throughout the state, while the balance is stored for future shipment. All tools and equipment are marked or painted before being reshipped.

Equipment and supplies purchased in wholesale amounts have been received and stored for distribution as needed to the department's recreational areas as in previous years. Signs have also been made and lettered for use at many of these areas.

Assistance to the State Highway Department consisted in receiving, holding and developing small trees and shrubs purchased from commercial

nurseries in wholesale amounts for roadside beautification work. About three acres of the Nursery area is used for this purpose.

The following table shows the value of Nursery stock distributed by years and the agencies receiving it:

**VALUE OF NURSERY STOCK PRODUCED**  
Years ending June 30, 1939 — June 30, 1940

	<i>1939</i>	<i>1940</i>
Trees sold to private planters .....	\$1,602.90	\$1,808.21
Trees given to 4-H and other juvenile clubs .....	838.45	986.64
Trees given to towns .....	725.50	796.50
Trees used on State lands .....	162.67	504.40
	\$3,329.52	\$4,095.75

NURSERY OUTPUT: FALL 1938 — SPRING 1939

<i>Age of Stock</i>	<i>White Pine</i>	<i>Red Pine</i>	<i>Scotch Pine</i>	<i>White Spruce</i>	<i>Norway Spruce</i>	<i>Red Spruce</i>	<i>White Ash</i>	<i>Balsam Fir</i>	<i>Total</i>
5 yr. transplants	.....	15,650	.....	.....	.....	.....	.....	.....	15,650
4 yr. transplants	23,895	29,475	1,850	24,480	9,700	.....	.....	34,260	123,660
3 yr. root pruned seedlings	197,610	79,160	600	134,060	100	750	.....	6,000	418,280
2 yr. seedlings	.....	.....	.....	.....	.....	.....	17,000	.....	17,000
	221,505	124,285	2,450	158,540	9,800	750	17,000	40,260	574,590

NURSERY OUTPUT: FALL 1939 — SPRING 1940

<i>Age of Stock</i>	<i>White Pine</i>	<i>Red Pine</i>	<i>Scotch Pine</i>	<i>White Spruce</i>	<i>Norway Spruce</i>	<i>Balsam Fir</i>	<i>Arbor Vitae</i>	<i>Black Spruce</i>	<i>Total</i>
5 yr. transplants	750	1,200	.....	.....	.....	.....	.....	.....	1,950
4 yr. transplants	26,900	39,700	4,500	18,000	4,000	23,570	1,512	25	118,207
4 yr. root pruned seedlings	5,300	46,500	.....	.....	.....	1,000	.....	.....	52,800
3 yr. root pruned seedlings	78,093	290,842	5,450	47,275	.....	101,000	.....	.....	522,660
	111,043	378,242	9,950	65,275	4,000	125,570	1,512	25	695,617

## FOREST PLANTING

L. N. WATSON



SINCE the hurricane of September, 1938 there has been less forest planting than in any similar period for years. Property owners have undoubtedly been occupied with operating and marketing problems. The same problems have occupied the time to a great extent of federal and state forest agencies who ordinarily give a fair share of their energy to assisting individuals in building up and improving their woodlots and timber lands. This responsibility cannot be overlooked or postponed as better markets and extensive cutting together with hurricane salvage work leave many sections of the state with little timber of commercial value to furnish labor income as well as products for our future needs.

Many land owners have depended on the seed crop which ripened just previous to the hurricane to produce another stand of timber on the land. This is taking place in some instances, but in a great many cases where natural seeding started, their small root systems have not been able to penetrate through the duff and far enough into the soil to obtain moisture. The opening up and exposure to the sun of these thick layers of duff have caused so much heat and drying out that the seedlings have died. These areas need to be planted immediately, or undesirable weed growth will establish itself and an undesirable stand will occupy the land for another generation when it could produce a more valuable crop in the same length of time.

There is an opportunity for farmers to increase the potential value of their forest by planting a few acres of forest each year and be reimbursed by the government up to \$7.50 per acre. This is possible through the A. C. P. planting program because of the assistance given to help maintain one of our natural resources and also to increase the value of their own property at the same time.

In a previous biennial report issued by this department, brief, concise directions were given for reforestation work. These directions have been reprinted as a forest planting leaflet which is still available without cost to interested parties requesting them. Additional emphasis might be put on three points which frequently need to be mentioned in correspondence with prospective planters. First, the state does not sell any trees for ornamental planting; second, planting plans should be made well in advance and trees ordered during the early winter for the following spring planting; third, all trees should be planted in the spring if possible instead of in the fall.

The following table gives the details of planting operations on state lands during the past two years:

**Planting on State Land by Tracts, Number and Species**

<i>Tract</i>	<i>Acres Covered</i>	<i>Red Pine</i>	<i>Norway Spruce</i>	<i>Balsam Fir</i>	<i>White Spruce</i>	<i>White Ash</i>	<i>Total</i>
Bear Brook	30.0	30,000					30,000
Black Mountain	7.6	4,000	3,625				7,625
Connecticut Lakes	11.5	500	4,500	6,500			11,500
Fox	6.0			2,000	3,000	1,000	6,000
Franconia Notch	0.3			310	20		330
Peterborough Pool	8.0	8,000					8,000
Russell-Abbott	37.0	37,000					37,000
Walker	3.9	3,850					3,850
	104.3	83,350	8,125	8,810	3,020	1,000	104,305



## EMERGENCY CONSERVATION WORK



URING the biennial period of 1939-1940, the following companies were engaged on forestry projects of the Forestry and Recreation Department, and one veteran company of the National Park Service continued work at Bear Brook. Their locations and official camp numbers are given as follows:

Camp Cardigan, S-54, at Danbury; Camp Monadnock, S-55, at Rindge on the Annett State Forest; Camp Warner, S-56, on the southern slopes of Mount Kearsarge; Camp North Woodstock, S-59, near North Woodstock Village; the Connecticut Lakes Camp, P-58, overlooking First Lake in Pittsburg and the Bear Brook Park Camp, SP-1 at Allens-town.

During April, 1939, the North Woodstock Company went to the Black Mountain State Forest in North Haverhill but retained a side camp to carry on such fire hazard reduction as was necessary near North Woodstock, notably, in Franconia Notch. On July 26, 1939, the Connecticut Lakes Camp was transferred to West Swanzey, since in this section of New Hampshire the 1938 hurricane had hit with great violence.

For the most part, the principal program of the five forest camps was fire hazard reduction, conducted in cooperation with the New England Forest Emergency Office of the U. S. Forest Service. Such work projects included the cleaning up of hurricane down-timber around and adjacent to buildings, villages and in strips of from 50 to 100 feet wide along highways, woods-roads and forest trails. While such work was, at the beginning conducted principally on private lands, the same type of projects and standards of work were later carried upon state owned reservations and forests.

The fire hazard and suppression activities of these five companies are herewith tabulated below:

### Fire Hazard Reduction—(On Private Lands)

<i>Name of Camp</i>	<i>Acres Cleaned in Towns</i>	<i>Miles Cleaned Road-sides</i>	<i>Miles Roads Opened</i>	<i>Miles Foot Trails</i>	<i>Water Holes Completed</i>	<i>No. Towns</i>	<i>Man-Days Fire Suppression</i>	<i>Tel. lines Built or Repaired</i>
Cardigan	1,160	98.0	14.5	10.5	8	8	682	1.5
Conn. Lakes	5	10.2	....	....	8	6	....	15.5
Monadnock	393	103.1	....	....	8	4	....	4.5
Swanzey	859	45.0	1.3	2.1	11	3	307	1.0
Warner	795	61.5	....	....	9	....	959	.25
Haverhill	596.4	144.7	....	....	....	....	1,758	....
	3,808.4	452.5	15.8	12.6	36	21	....	22.75*

\*Telephone lines built or repaired were almost wholly on state lands.

### Fire Hazard Reduction

Late in 1940, after the essential fire hazard reduction work had been completed upon private property, similar projects were applied to state lands lying within each camp's working circle. Accomplishments of these camps are given for each state forest or reservation.

#### Camp Cardigan

On Belknap Mountain, the foot trail leading from the parking area to the summit was cleared of blow-downs and the ditches and culverts along the mountain road were cleaned out to prevent all possible damage from erosion.

At Cardigan Reservation salvage and complete clean-up of hurricane timber was undertaken along the two miles of entrance road, around the parking area and along the foot trails. The repairing of the telephone line to the Mount Cardigan fire lookout station and clearing of the right-of-way is listed in the above table.

Salvaging of all merchantable timber on the Mascoma State Forest and a complete clean-up was carried on in the fall of 1940. Forty cubic yards of sphagnum moss was collected for the use of the State Forest Nursery in shipments of nursery stock. In cooperation with the State Department of Fisheries and Game a temporary coffer-dam was constructed at the outlet of Morey Pond on the Kearsarge Mountain Reservation. This was for the purpose of testing the suitability of the site for a permanent dam to be used for raising the pond's level in fish culture.

At Wellington Beach on Newfound Lake, fire hazard reduction was completed on sixteen acres of blow-down.

#### **Camp Monadnock**

Shortly after the 1938 hurricane, this camp was re-occupied since it was located in one of the most severely damaged sections of the state. Following fire hazard reduction projects upon private lands similar activities and other projects were conducted upon the following state lands.

On the Annett State Forest a bridge at Hubbard Dam was repaired and the truck trails cleaned up and maintained. At Pack Monadnock Mountain a new cabin on the Miller Park Reservation was built for the fire lookout watchman's use. In addition, the cab of the lookout tower was enlarged so as to provide more floor space for visitors. Work on the telephone line is included in the hazard reduction table.

At the Peterborough swimming pool seven acres were planted with red pine since the timber previously there had been blown down by the hurricane.

On the Annett, Casalis, Haven and Monadnock Forests a total of 227.1 acres were cleared of hurricane-felled timber, as well as all roadsides. Boundary surveys and type-mapping was also conducted from this camp.

#### **Camp Warner**

This camp was originally occupied for the reconstruction of the old Mount Kearsarge Toll Road, but due to serious fire hazard in this section its principal activity during the biennial period was hurricane hazard reduction.

On the Kearsarge Reservation down timber was cleaned up along the Toll Road and foot trails, and three water holes were constructed. Salvage of timber was started on the Harriman-Chandler Forest, one water hole built and a truck trail improved.

At popular Wadleigh Park on Kezar Lake in Sutton, 30 acres were cleared of blow-downs, about 400 cords of wood and pulp being realized. A 41-foot steel tower was erected on Craney Hill in Henniker, replacing the old wooden structure. In addition, a standard two-room watchman's cabin was built, thus providing permanent facilities at this station.

#### **Camp Swanzey**

The work program at this camp was almost entirely hurricane hazard reduction on privately owned lands and is reported in the foregoing table. In addition, maintenance and inspection of nineteen government lumber

yards was handled by this camp in cooperation with the U. S. Forest Service.

On state lands salvage of down timber was carried on upon the Chesterfield Gorge and Pot Holes Reservations. Nine acres were cleared of slash and 98 cords of wood and 2,500 board feet of logs realized.

#### Camp Haverhill

At the beginning of the biennial period this company was located at North Woodstock but was eventually transferred to North Haverhill on the Black Mountain State Forest. A side camp was retained at North Woodstock to continue hazard reduction work in nearby towns. The clean-up work reported in the fire hazard reduction table covered work in 11 towns. This camp also assisted in protecting from fire five government lumber yards and pulp storage sites. A forest tree planting demonstration plot was established on lands of the North Haverhill Water and Lighting District, five acres being reforested. White pine blister rust control was conducted upon 880 acres in the town of Bath.

At the Boardman Farm area a frame building was constructed to replace a barn destroyed by the hurricane. The farm house was renovated and sanitary facilities installed. A septic tank with dry well and sewer line from the buildings was constructed and several rods of tumbled-down stone walls around the fields were rebuilt.

On the Black Mountain Reservation a dam erected at the outlet of an old quarry has created a permanent pool, this assuring an adequate water supply in case of fire. The Chipewas swimming pool was excavated and now provides much better bathing facilities together with a shallow area for small children. To prevent under-cutting and washing of the banks of the brook supplying the pool, 307 square yards of stone rip rap were laid. The landscaping of the area about Chipewas Camp was continued with ornamental plantings, grading, seeding and sodding, and 400 feet of gravel walks. Several small parking areas, with the necessary guard rails, were built about the area. The road entering the reservation was relocated for a distance of 300 feet, and .2 of a mile improved and resurfaced. Boundary fences for a distance of 15 rods were replaced with new cedar posts and wire. Timber stand improvement was conducted on 3.5 acres and 7,000 seedlings were planted.

In Franconia Notch roadside fire hazards caused by the hurricane were cleaned up and these accomplishments are included in the hazard reduction table. Similar work was also done within and along the Fay Reservation in North Woodstock.

#### Connecticut Lakes Camp

This camp was established to build a road from Second Connecticut Lake to the Canadian border, near Chartierville, Quebec. Completed in the summer of 1939, the company was transferred to West Swanzey to assist in the emergency created by the hurricane.

In the Connecticut Lakes Reservation the road was completed by the building of the remaining .6 of a mile and two miles were resurfaced. A permanent bridge over the Connecticut River, at Moose Falls, was constructed. Near the Canadian border an old burn of 11 acres was reforested and the boundaries of this reservation of 1,130 acres surveyed and marked. In cooperation with the State Department of Fisheries and Game, 105,000 fish were planted in nearby streams and ponds. Telephone line construction and fire hazard work are included in the hazard reduction table.

### Bear Brook Camp

Established in Allenstown in 1935 this Veteran Camp under the National Park Service has worked during 1939 and 1940 mainly within the Bear Brook Reservation on the Day Outing and Bathhouse areas. A modern bathhouse and artificial beach 500 feet in length overlooking Catamount Pond have been under construction as a part of the day use area. The bathhouse 38 by 74 feet, utilizing local granite and other building materials, has a capacity of 1,000 persons per day. Landscaping has been done to provide a natural setting for the building. The bathhouse will be completed for use during 1941.

A complete water system to serve the bathhouse as well as the picnic area now in operation has been installed. Construction features include a 10 by 50 foot filter field, 2,500 gallon storage tank, pump house, 1,000 gallon pressure tank and automatic pump, complete with 3,000 feet of water distribution lines.

A system of sewerage handling wastes from the bathhouse has been already constructed. This installation includes a 5,000 gallon septic tank, automatic sewage injector pump, 8,000 square feet of disposal field and 2,000 feet of tile effluent sewer line. Power, telephone and storm drain connections have also been placed.

In the picnic area, a 20 by 30 foot latrine building and a system of waste disposal is also under construction. This building is scheduled for operation in 1941.

Under the sponsorship of the D. A. R., 25,000 three year old red pine seedlings have been planted in an area of 50 acres adjacent to the Allenstown Meeting House. This memorial plantation is to be known as Penny Pine Forest. A large boulder at the site bearing a suitable plaque commemorates the occasion.

In addition to fighting forest fires covering 2,100 acres, fire hazard reduction was carried out on 623 acres of land, and a strip 50 to 100 feet wide along ten miles of highway. In the Day Outing Area, salvage operations were carried out on 50 acres after the hurricane.

The reconstruction of 16.7 miles of telephone line between Unity and Lempster in hurricane rehabilitation work was also accomplished by men from this Camp occupying the abandoned Goshen Camp.

Tree insect pest control such as open woodland scouting for gypsy moth extended over 7,763 acres in the Bear Brook Area.

Other activities of this group include construction of directional and information signs, picnic tables and fireplaces, storage buildings, pond site clearing of 15 acres of flowage and public camp ground maintenance.

## WHITE PINE BLISTER RUST CONTROL

L. E. NEWMAN

### Introduction



ASTERN White Pine constitutes the principal forest tree in New Hampshire. It is a prolific seeder and constantly exhibits its ability to thrive on a variety of soils, readily establishing itself on many abandoned farms or other lands whose original use was terminated. Irrespective of economic conditions, the annual cut of white pine ranges from 65 to 75 percent of the entire lumber cut of this state. Its logging, transportation and manufacture call for an expenditure which contributes materially to local livelihood and business.

Apart from its commercial worth this species has a high value for watershed protection and is planted extensively by town and city water boards. As an aid in preventing rapid run-off from melting snows, white pine contributes much in the regulation of spring-time floods.

From an ornamental point of view white pine adds immeasurably to the attractiveness of this state and is much remarked by the tide of tourists who annually visit New Hampshire. It increases considerably the value of recreational and estate properties.

If white pine did not possess any value as a timber species, it would still constitute an asset to a state in which recreation has grown (in the winter as well as the summer) to a business of no mean proportions. Consequently, its protection from fire and disease is of paramount importance. That this is generally conceded has been demonstrated by a statewide effort during the past years in the control of blister rust, a serious bark disease of all species of white pine.

While blister rust control in New Hampshire has been conducted largely through cooperative effort with towns and cities, more than 600 private owners and timber organizations have financed control measures upon their own lands in cooperation with the state and federal governments.

Since 1935, the Bureau of Entomology and Plant Quarantine, the federal agency cooperating with this state, has received allocations of WPA funds and in turn have made available certain amounts annually for blister rust control in New Hampshire. As a matter of fact, federal monies received from this source have considerably exceeded the combined appropriations of the state and cooperating towns. Thus, at no expense to local and state governments the program of control has been greatly advanced. The time will shortly arrive when assistance from out of the state can no longer be counted upon, and the control program will have to be financed by the state and its political subdivisions.

### Town Cooperative Control—1939

Returns received from their annual meetings indicated that 36 towns had appropriated \$9,550. State aid available increased these funds by \$2,387.50 thus giving a total of \$12,937.50 for the cooperative project. Town appropriations were made as follows:

\$50	\$100	\$200	\$300	\$400	\$500
1	6	12	5	11	1

Of the total number of towns appropriating only 12 made anywhere near adequate sums, 11 being \$400 and one being \$500. Even paying unskilled labor the average local rate of 40 cents per hour, a five-man crew will use up a \$400 appropriation in about 4½ weeks, a period so short



as to permit covering only a very modest area. Extent of the area put under protection depends principally on the abundance and distribution of ribes (currant and gooseberry bushes). Furthermore, it often happens that a local crew is only partially experienced and some days are required before the entire unit is performing efficiently. Towns would obtain much more proportionately, and permit longer employment, if appropriations were sufficiently large to give two to three months work. Incidentally, and important too, initial control measures would be completed sooner and the possibilities of the spreading of the disease greatly reduced.

In the conduct of town cooperative work, no departure was made in the methods and policies of previous years. Local labor was secured through town authorities and the rates paid labor were those set up by the towns. These did not differ from other years varying from 32 to 40 cents per hour. The local week was also adhered to and ranged from 40 to 48 hours. In many towns there is an increasing tendency toward a 5½ day-week. A total of 259 men were given employment aggregating 3,202¼ man-days.

*Federal Emergency Relief Funds—1939.* From 1935 to 1938 inclusive, allocations of WPA funds granted to this state through the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, have made possible initial control work over areas totaling 215,860 acres and re-checking of 226,940 acres originally worked some years previously. In this program several towns and counties have cooperated by furnishing transportation for local crews. Not only have these funds furthered the blister rust control program, but they have been instrumental in furnishing several months employment each summer in towns where there was no other work or relief projects.

From early May through September, 1939 ribes eradication was again conducted with WPA funds and 375 men were employed during this period, putting in 4,952½ man-days of labor. Two towns and one county contributed funds for the transportation of crews, federal non-labor allotments being insufficient to provide for all of the field units.

A summarization of accomplishments in control work under the town, state, and WPA programs will be found on page 59.

*Other Control Programs—1939.* In addition to the control work described above, ribes eradication was carried on upon the White Mountain National Forest in the towns of Albany, Bartlett, Chatham, Hale's Location, Landaff and Thornton. A total of 5,356 acres were worked in these towns. Blister rust control was also conducted by the Manchester Water Board in the towns of Auburn, Candia and Hooksett. The City of Manchester Water Board has shown commendable foresight for some years in assuring its white pine plantations, as well as native growth, protection from the blister rust disease.

*Pine and Control Area Mapping—1939.* Since the inception of mapping white pine lands in 1933, there had been surveyed up to December 31, 1938 a total of 1,013,093 acres. During this program, an additional 172,522 acres had been examined but not mapped since there was not sufficient pine to warrant blister rust control.

In the late winter and early spring months and again in the fall, mapping was resumed, being financed by a WPA allotment. Aside from their use in determining what areas should be put under control and in ribes removal,

these surveys have also been used as a basis for town property maps. The results of seven months mapping are shown below.

#### Town Cooperative Control—1940

In March, 1940 appropriations for blister rust control of \$10,330 were made by 40 towns. This was a slight increase over appropriations of the preceding year. Local labor selected by town officials was employed and for the season totaled 295 men. Rates of pay and hours of work conformed very closely to those of 1939 and were based on schedules set up by the towns.

*Federal Emergency Relief Fund—1940.* Although allotments of WPA funds were reduced somewhat in 1940, nevertheless the allocations permitted ribes eradication in 30 towns. Wage rates and hours per month were set up by the State Work Projects Administration and labor was obtained from its Division of Labor. A total of 231 men were employed during 1940 under the relief program. A resume of the control measures for this season will be found in the Biennial Summary below.

*Civilian Conservation Corps—1940.* As a result of the 1938 hurricane all work of the CCC Camps was confined to fire hazard reduction and it was not until the late summer of 1940 that any blister rust control work was resumed. Two camps, the Danbury and North Haverhill, with units of 9 and 12 men respectively, were engaged in ribes eradication for a few weeks, the work of the former being confined to Grafton and that of the latter to Bath.

#### Biennial Summary — Blister Rust Control Town, State and Federal 1939 and 1940

Project	Initial Work		Reeradication Work	
	Acreage Covered	Ribes Destroyed	Acreage Covered	Ribes Destroyed
Town				
1939	3,226	115,309	22,017	325,242
1940	3,799	127,161	19,142	263,974
WPA				
1939	16,590	710,888	32,624	574,513
1940	14,537	644,908	35,237	408,047
CCC				
1940	835	23,264	.....	.....
	38,987	1,621,530	109,020	1,571,776

*Pine and Control Area Mapping—1940.* During the usual period, January to May and again from October through December, mapping of white pine regions was conducted by a much smaller force than that employed during the same period in 1939. WPA allocations permitted the use of only 21 men on this program. The results will be seen in the following summary:

#### Biennial Summary Pine and Control Area Mapping 1939 and 1940

Year	Man Days	Total Acreage		Per Acre Cost
		Mapped	Eliminated	
1939	5,513	171,672	33,093	\$0.115
1940	2,717	129,498	18,749	0.105
Totals	8,230	301,170	51,842	0.11+

### Blister Rust Damage Studies

For the purpose of determining the extent of damage among white pines, investigations were conducted in the spring of 1940 in the towns of Bath, Haverhill and Piermont. A total of 41 one-acre plots were taken at random and the pines classified according to their growing condition, that is: free, dominant, intermediate and suppressed. At the same time the infection condition of each tree was recorded. In setting down the infection conditions no separate division was made between pines which were healthy and those with infected branches. Damaged pines included only those with live trunk infection, or cankers, and which will certainly die; those with dead tops, and trees entirely dead.

The summary of these studies showed that in Bath, Haverhill and Piermont 31.26 percent, 30.17 percent and 44.86 percent respectively were either dead or in a dying condition. For the entire 41 acres the loss was 35.07 percent. Undoubtedly, additional damage will result as the disease from infected side branches reaches the trunks.

By comparing the number of infected trees with their growing condition it was found that the best trees in these areas, namely the dominant class were hit the most severely. From the data obtained it was shown that 40.47 percent of the dominant class were dead or dying. In other words a thinning of a white pine stand by blister rust is not a "blessing in disguise" to the owner since the better class of trees are killed, leaving the more inferior and less valuable ones.



*Blister Rust kills pines of all sizes.*

## FARM FORESTRY IN NEW HAMPSHIRE

K. E. BARRACLOUGH, *Extension Forester*



HE physical characteristics of New Hampshire are such that much of its area is better suited for the growing of forests than for any other purpose. Four-fifths of the total land area is woodland. New Hampshire farmers manage 36 percent of the land, of which 60 percent is in forest. If there is to be a consistent and prosperous rural economy in the state, it is necessary to depend upon the annual income derived from the forests. Farmers should have sufficient acreage of growing timber of different age classes so that work in the woods will be provided for men and teams during the winter months and periods when other agricultural activities are at a minimum. They should be able to cut enough forest products each year to meet their own needs besides being able to sell forest products in sufficient quantities to be of material assistance in supplementing the annual farm income.

The farm woodlands and other commercial forest areas should be so managed as to yield the greatest return in the shortest time with the least amount of effort, without exploiting the resources thereon. When the timber is stripped from the farm holdings, the owner not only sacrifices the opportunity for a future revenue from timber, but, eventually, as others follow the same practices, the income from forest products is reduced for all the people in the community and the state. In order to grow timber as one of the important agricultural crops, it is necessary to decide where timber should be grown on the farm and on other holdings in the community, and then prepare a well formulated plan that can be used in growing, reproducing, and marketing forest products. The timber growth should be looked upon as a bank account capable of earning a certain rate of interest each year. Comparatively few woodland owners have acquired the understanding or the skill of growing and harvesting forest products as a crop. Experienced only in the practice of timber stripping, it is difficult for woodland owners to take a long range attitude, required in sustained yield management of woodlands.

The farm forestry problem as it relates to the prosperity of rural New Hampshire was recognized by foresters and a few woodland owners at an early date. By 1924 sufficient public interest in the problem had developed so that it was possible, through federal funds under the provisions of the Clarke-McNary Act, for the State Forestry and Recreation Department and the University of New Hampshire Extension Service cooperating together, to employ an Extension Forester to develop a farm forestry program. The principal objective of the Extension work in farm forestry was to demonstrate the best methods of growing and marketing farm wood and timber products. Since 1924 the farm forestry program has been a part of the Agricultural Extension activities of the University. At the start the educational effort in farm forestry was of a general nature.

Recommended forestry practices have been discussed and demonstrated at hundreds of meetings in the woods and at sawmills throughout the state. In nearly every town there is a farm forestry committee composed of local citizens, who cooperate with the Extension Service in interesting other woodland owners in the growing and marketing forest products, and advising with Extension workers on local forest problems. The local farm forestry committees were developed to the fullest degree following the hurricane of 1938, and it was through the excellent work of these com-



mittees that the timber salvage program was carried out so successfully. The local forestry committees are in a continuous state of revision. Gradually woodland owners in towns throughout New Hampshire are taking the responsibility of developing a well-rounded program of forestry as applied to farm woodlands and other timber lands in their communities.

While progress in convincing woodland owners of the need of growing timber as a crop has been slow, definite advancement is being made. The most complete records on woodland improvement have been kept of the accomplishments in forestry by the boys and the girls of the state. Members of 4-H forestry clubs and other youth have learned to appreciate the importance of New Hampshire timber resources by carrying on definite forestry practices such as the planting of forest trees, the management of young timber stands, and the protection of forest resources from fire, insects, and disease. From 1926 up to 1940, over 10,000 4-H boys and girls of New Hampshire have planted 2,781,129 forest trees from the State Nursery, improved 3,620 acres of woodland, and have learned to identify the important timber trees by making 5,160 twig, leaf, and wood collections. One of the most recent developments in junior forestry activities has been the organization of 4-H Forest Fire Rangers. During 1940, over 1,000 4-H members and Boy Scouts participated in the program. The 4-H forest fire rangers, under the leadership of the local fire wardens, or other interested citizens, do patrol work during the forest fire season and learn how to prevent and suppress forest fires.



*More than 300 farmers have sold timber and pulpwood through cooperative marketing. (Photo by Extension Service)*

The interest of many woodland owners has developed to a point where they are carrying out recommended forestry practices. The County Agricultural Agents reported for the calendar year 1939, that 4,233 farmers carried on one or more forestry practices as planting, weeding, thinning, pruning, selective cutting, and cooperation in the prevention of forest fires. Two thousand eight hundred and twenty-seven farmers were assisted in timber estimating and the marketing of forest products.

Starting in 1936, forestry practices were included in the Agricultural

Conservation Program. Farmers who qualify under the program receive payment for fencing livestock out of the woods, planting forest trees, and for woodland improvement, and during the two years following the hurricane payment was allowed for the clearing up of slash resulting from the 1938 disaster. For the years of 1936 to 1939, inclusive, farmers signed up in the program planted 347 acres of forest trees, fenced some 12,000 acres of woodland from pasture, improved 5,279 acres of woodlands by weedings, thinnings, and improvement cuttings, and during 1939 cleared up hurricane slash on 12,690 acres.

Public interest in the farm forestry extension program which started in 1924, has gradually crystallized to a point where it has become practical to intensify the educational efforts in the growing and marketing of timber products within selected areas where the woodland owners have shown sufficient interest. After a long period of general educational effort in farm forestry and because of the economic situation, the first forest products cooperative marketing association in the United States was organized in Coos County, November 21, 1935. Over 300 farmers have marketed through their cooperative, approximately 50,000 cords of pulpwood, 5,000,000 feet of logs for lumber, and 45 carloads of Christmas trees. From an inventory of the forest resources on the 288,754 acres of farm woodlands in the area, which includes part of Essex County, Vermont, the annual growth of forest products was computed to be 72,054 cords, which can be increased as the sustained yield management program is developed. The forest data and the maps for the area, as prepared by the U. S. Forest Service are being used to make individual farm woodland management plans. Before a plan is prepared for a farmer the forester working on the project determines whether the owner will cooperate in carrying out reasonable forest practice recommendations that will be incorporated in the plan. The forester, in going over the recommendations with the owner upon the delivery of the plan, locates the cutting areas in the field and marks the trees for cutting on a small demonstration area as a guide to the owner. If a request is made to mark all the trees to be cut in the cutting area, the necessary arrangements are made through the cooperative and the owner pays a minimum charge for this service. While such intensive educational effort has not been under way a sufficient length of time to measure the results, general observations show conclusively that better woodland management has resulted. Farmers in the Coos area frankly admit that the Cooperative Marketing Association has been an important factor in stabilizing and improving the market for their forest products.

As farmers in other sections of the state learned about the Coos Cooperative they requested assistance in organizing similar associations in their respective areas. Farmers have been urged to go slowly in organizing new associations until they fully understand the problems involved and have determined whether a marketing association is the correct approach to the problem in their area.

Interest in the cooperative marketing of forest products developed to a point among a group of Carroll County farmers where it appeared desirable to determine the practicability of such an organization. In the area selected for the study, the town of Tamworth and adjacent towns, it was found that there were approximately 260,000,000 feet of merchantable timber growing on 51,827 acres and that the estimated annual growth was computed to be approximately 5,000,000 feet. One hundred



and fifty-six woodland owners were found to be favorable to some form of a forest products marketing association, 13 unfavorable, and 128 indifferent. This information, along with other data, was presented to a Carroll County committee of woodland owners interested in organizing an association. The committee called a general meeting of woodland owners who heard the report and voted to organize. The Carroll County Forest Products Association, Inc., was organized during the early summer of 1940 and started to market forest products for over sixty members during the fall and winter of 1940.

Forest practice rules to be used by the members in the harvesting of forest products have been prepared and approved by the Board of Directors of the Cooperative, the State Forester, and the Extension Forester. A Project Forester, under the joint supervision of the State Forestry and Recreation Department and the University of New Hampshire Extension Service, is preparing maps and woodland management plans for individual holdings on the same basis as in Coos County. By July 1, 1941, maps and management plans will have been prepared for over 7,000 acres of farm woodlands.

Northern Cheshire and southern Sullivan Counties represent a third region in the state where there is a pronounced interest in the cooperative marketing plan. A study similar to the one made in Carroll County is under way. The development of the Cheshire project is especially interesting, because the owner of a permanent wood using industry located in the area, has indicated that his industry will purchase forest products from the marketing association if organized and will give a premium on every thousand feet of timber purchased, provided the members of the association will conform with recommended forest practice rules drawn up by the cooperative.

If the two marketing projects already organized and the one in the early stages of development prove to be practical and successful, they will gradually extend into other sections of the state. Already the public interest in the sustained yield management of timber resources as a means of stabilizing a rural economy, has become so sincere that there is general talk of the need of some form of public regulation relating to the harvesting of forest resources from private lands. Eventually woodland owners within a working circle served by a marketing association, in an attempt to bring about sustained yield management of timber lands find that there is a point beyond which education cannot be effective. There should be available, then, legal tools, which might permit local enforcement of forest practice regulations.

One may conclude, therefore, that a progressive and more intensive program of local education, the organized marketing of farm forest products, and the provision in later stages for certain minimum requirements to be set up by the state will be the most effective means of ultimately achieving sustained yield management of farm woodlands.

## FOREST RESEARCH

HENRY I. BALDWIN



INVESTIGATIONS centering around the Fox Research Forest in Hillsboro were continued in spite of the interruptions caused by the hurricane of September, 1938 and subsequent salvage operations. All older permanent sample plots have been remeasured and a number of new experiments laid out. In this work WPA Projects 1323 and 2294 have been of substantial assistance. Rudolph G. Paquette was employed on these projects at Hillsboro from March, 1939 until July, 1940 and Walter E. Brown was transferred back to Hillsboro from the Concord office in August, 1939 and remained until the end of the project.

### Experimental Work

Investigation of the effect of seed origin was continued, and a large number of plots were planted in 1939 and 1940 on the Vincent Tract in Deering with trees from different sources. Other seedlings were transplanted in the nursery. Snow depth measurements were continued, yielding data on the interception of snowfall by forests, and their conservation of snow in spring. Experiments aimed at developing improved methods of producing and handling fuelwood were also performed, including tests of different materials for roofing cordwood piles. Surveys of spruce sawfly populations and the character of reproduction present on blowdown areas were carried out. Current measurements on a number of other projects, including remeasurement of all sample plots damaged by the hurricane, were completed.

### Cooperative Research Projects

During the summer of 1939, Charles S. Simmons of the U. S. Soil Survey, with the assistance of Reeshon Feuer of the N. H. Agricultural Experiment Station, completed a detailed soils map of the Fox Forest which will be increasingly useful as time goes on in correlating forest growth in different parts of the forest. Dr. Robert Chandler of Cornell also visited the Forest and assisted in classifying humus types. Dr. James Johnston of the Harvard Forest made studies of soil fauna. All these investigations provide excellent basic information on the forest soils in this section of the state.

The abnormally high forest fire hazard produced by the hurricane slash called for extra alertness on the part of the fire protective organization. In cooperation with the U. S. Forest Service and the U. S. Weather Bureau several fire weather observation stations were established in New Hampshire, one of them at the Fox Forest. Readings of fuel moisture, wind velocity and direction, relative humidity, temperature, rainfall and visibility were made three times daily and telegraphed to the Weather Bureau in Boston. These observations were made from April through November in 1939 and 1940. A recording apparatus was installed whereby daily wind movement may be measured throughout the year.

The series of leaflets on forest insects and diseases was concluded with the appearance of the fiftieth leaflet in the series in 1940. The entire series was then reprinted in a single 200-page volume entitled "Important Tree Pests of the Northeast." Cooperative projects with the U. S. Bureau

of Entomology and Plant Quarantine and Northeastern Forest Experiment Station have been continued.

The game management study on the Pillsbury Reservation in accord with the ten-year agreement with the U. S. Biological Survey has been less active since the transfer of John Pearce to other work. Messrs. Hamlet and Spencer of the U. S. Fish and Wildlife Service have made experiments in porcupine control on the Fox Forest.

#### Growth Study Plots on State Forests

A number of sample areas have been established on state forests with the assistance of WPA and CCC for the purpose of determining the rate of growth and yield of products by different ages and types of forest, and to observe the effect of cultural treatments such as thinning and



*Large red oak cut on Fox Research Forest. Volume 600 feet B. M.*  
(Photo by Baldwin)

weeding on the rate of growth. Many of these areas border on highways and will be designated by appropriate signs so that interested passers-by may inspect them. The following is a summary of results from these experimental and demonstration plots so far.

#### Weeding

This refers to freeing young trees not yet in the sapling stage from competing "forest weeds," usually hardwoods such as gray birch and alder, or sprouts of various species which suppress young conifers. Young hardwoods may be weeded to free white ash, hard maple and paper birch from more aggressive, but less valuable species. Plots to study the effect of weeding have been laid out on the Fox, Contoocook and Pillsbury Reservations and older plots established on Brown Company lands are being observed by the department. The following data illustrate the type of results so far obtained:

**Spruce Weeding Plots on Pillsbury Reservation**  
Age of stand 18 years

Established 1934	Plot 16 Heavy Weeding (all hardwood removed)	Plot 18 Moderate Weeding (hardwood thinned heavily)	Remeasured 1939 Plot 17 Control No treatment
No. trees per acre 1939	1,270	1,470	2,070
Volume cu. ft. 1939	667	645	899
Mortality 1934-1939	8% tree number 3% volume	5% tree number 10% volume	11% tree number 6% volume
Current Annual Increment	71 cu. ft. per acre 22.8%	60 cu. ft. per acre 17.5%	64 cu. ft. per acre 11.8%

These results show that complete removal of hardwood sprouts from spruce reproduction at a cost of two dollars to three dollars per acre has resulted in doubling the rate of growth per acre during the first five years. The untreated plot produced almost as much wood per acre, but it was laid on a larger number of trees, mostly inferior hardwoods, which will never become merchantable. Partial weeding, leaving some better hardwoods where these are present is recommended. Weedings ordinarily yield no marketable product and hence should be undertaken with caution.

### Thinning

A considerable number of thinning experiments have been laid out on the Davisville, Fox, Honey Brook and Scribner Fellows tracts. In addition records are being kept of similar experiments on town forests and private lands. The bulk of the latter plots were destroyed in the hurricane and plots on state lands are mostly of too recent origin to yield conclusive evidence of the value of thinning. The following examples are given:

#### Thinning in Red Maple

Remeasured 1939	Plot 23 Thinned 1934	Plot 24 Control — No Treatment
No. trees per acre	710	1,720
Total volume cu. ft.	796	1,514
Mortality 1934-1939	5% tree number 3% volume	12% tree number 4% volume
Net current annual increment	42 cu. ft. per acre 7.2%	40 cu. ft. per acre 3.0%

This shows that young stands, of species which react promptly and vigorously to take advantage of additional growing space, are markedly stimulated by thinning. Growth is concentrated on a smaller number of the best selected stems and many trees which would have died (as shown by mortality figures) were removed and utilized. Trees which react promptly to thinning are white pine, balsam fir, red maple, and white ash. Many other trees are slower to react, especially if they have been crowded too long. Thinnings in red spruce 53 years old on the Honey Brook State Forest made in 1933 have had no noticeable effect so far, except to increase the losses from windfall (during the hurricane). The stand was too old to benefit from thinning, and the rate of growth has actually been decreased due to mortality. Indications are that thinnings to be of greatest benefit in improved growth and health of forest stands must begin between the twentieth and thirtieth year under conditions prevailing in New Hampshire.

### Girdling

Trees of all kinds, which due to poor form, slow growth, decay, distance from markets or other factors have no present or prospective value for any purpose, and in addition are a detriment to young, healthy trees, may be eliminated more cheaply by ringing or girdling than by cutting. The trees released are able to grow rapidly into merchantable timber just as if the interfering trees had been felled. So far girdling has been applied chiefly as an aid in reducing the competition of old worthless hardwoods on spruce-hardwood lands where markets for cordwood are lacking. Hardwoods have been girdled to a limited extent to free young pine, and extremely crooked and forked white pines may be girdled to release smaller trees. Plots have been laid out on the Fox and Pillsbury Reservations. An illustration of the results of girdling large red maples to release natural white pine saplings is afforded by plots on the Fox Forest.

#### Girdling Maple to Release White Pine Fox Forest

##### Results of 1939 Remeasurement

	Plot 11	Plot 12
	Approx. 20 large maples per acre girdled 1934	Control No treatment
No. pine per acre	1,240	600
Vol. pine cu. ft	911	3,045
Current annual growth	105 cu. ft. per acre 27.5%	112 cu. ft. per acre 4.5%

These plots are not perfectly comparable, since the untreated plot happens to have a smaller number of pines but larger size (with over three times the volume) than the treated plot, but the stimulation in growth rate as a result of girdling is none the less significant. Usually girdling will not be recommended where the offending trees can be turned into fuelwood at a cost which will pay for the operation. Often, however, felling these large trees breaks down the very trees which are to be released, and girdling is then preferable. Girdling should not be done near roads or trails where the dying trees would prove unsightly. Given the suitable combination of conditions girdling is a cheap and effective means of increasing the growth of young timber.

### Growth Study and Plantation Experiments

Plots have also been established in some natural stands and plantations, which do not involve any silvicultural treatment, but are for the purpose of observing the current rate of growth and to furnish demonstrations to private owners of the volume and growth of different types. Other plots have been planted at different spacings, and with trees from different seed sources. Small permanent plots have also been established to follow the progress of natural restocking of hurricane denuded areas.

### Forestry Demonstrations and Exhibits

Two portable steel charcoal kilns were purchased second hand in the fall of 1938 and used with considerable success in converting into charcoal the enormous quantities of poor grade wood produced in connection with hurricane salvage and clean-up work. Charcoal produced was sold to state institutions and used at state camp grounds. During the summer of 1939 the kilns were operated at the Canaan Fair and exhibited at the Eastern States Exposition, evoking much interest and many inquiries. It is hoped that the making of charcoal may be revived by private owners



of forest land in view of the current war-time demand. It offers a partial solution to the problem of utilizing thinnings and other wood for which there is no regular market.



*Charcoal kilns in operation at the Fox Research Forest in Hillsboro.*  
(Photo by Baldwin)

Exhibits showing the uses for New Hampshire woods, and demonstrations of forestry practice and protection from fire, insects and disease were set up at county fairs. The forestry museum at Hillsboro was also improved and contains all exhibit material of the department when not on tour.



*First grade cleft cordwood, an important New Hampshire fuel.*  
(Photo by Baldwin)



**Management of Fox Research Forest**

The two years here reported include the bulk of hurricane salvage, which is still being continued. Almost all the good timber, especially the older stands, was destroyed. The bulk of the saw timber was removed the first year and sold to the Timber Salvage Administration. A small quantity of sub-grade logs was sawn into lumber. Cordwood was sold to dealers chiefly in Massachusetts and pulpwood to the government and excelsior mills. The salvage of down timber was done by contract. An area of about five acres was cleaned up by WPA but about 200 acres of blow-down have so far received no slash disposal, nor any clean-up other than that incidental to salvage. Part of this area is in young pine and hardwood which cannot be salvaged economically and must await special clean-up, funds for which are not available. The annual cuts for the two fiscal years were as follows:

Annual Cut — Fox Forest		
	1938-39	1939-40
Sawlogs (bd. ft.)		
Softwood .....	955,411	28,156
Hardwood .....	116,801	47,031
Total .....	1,072,212	75,187
Pulpwood (cords)		
Poplar .....	3.079	21.803
Fir .....	....	0.046
Spruce .....	....	5.932
Willow .....	0.656	....
Total .....	3.735	27.781
Cordwood (cords) .....	402.97	490.712
Fence posts (no.) .....	2,006	808
Total in cu. ft. ....	122,723.8	48,081.6

**Natural Regeneration Following the Hurricane**

Some examinations have been made of areas which were completely denuded by the 1938 hurricane to determine what, if any, tree reproduction was present, in order that the future stand on such lands could be forecast and the need for supplementary planting estimated. It was found that on the heavier soils and especially moist sites hardwood seedlings and sprouts were numerous enough to completely stock the land. Most of these had been present as undergrowth in the old pine stands. Paper birch, gray birch, aspen and pin cherry are predominantly of seedling origin, from seeds which have germinated since the blow-down. There are, however, frequently areas up to an acre in size which are inadequately stocked with better species of hardwoods, and many of the sprouts are defective in form. These small areas might be planted effectively.

The following stocking was determined from an average of 60 plots on heavy loam soils in the southwestern part of the state:

Species	Average Number of Seedlings and Sprouts per Acre
White pine .....	918
Hemlock .....	49
White ash .....	475
Red oak .....	754
Red maple .....	5,000
Sugar maple .....	393
Paper birch .....	5,328
Basswood .....	16
Aspen .....	311
Pin cherry .....	16
Black cherry .....	1,032
Gray birch .....	1,775

Insufficient data have yet been obtained for sandy soils, but some observations show that pine will be more strongly represented on these soils in the next stand, while on heavy soils hardwoods will predominate. Plantings of pine on sandy soils will suffer less from competition of hardwoods.

#### The European Spruce Sawfly

The depredations of this introduced insect described in our last report continued during the summer of 1939. The area of heavy infestation in the Monadnock region was enlarged and spread northward about five miles to the southern part of Hancock, causing severe damage in Harrisville and Nelson. Heavy defoliation also occurred on the south and west sides of Mt. Monadnock and on South Pack Monadnock. Moderate populations were also reported in northeastern Pittsburg. All indications pointed to renewed heavy attack in 1940. However, a larval disease, apparently similar in nature to the wilt disease of the gypsy moth, appeared in the late summer of 1939 followed by cool weather in September, so that only a small percentage of second generation larvae were able to complete pupation. The population of sound cocoons were everywhere lower than in the two previous years. Nevertheless CCC crews from the Jaffrey Camp were able to collect 600,000 cocoons on the south and west slopes of Monadnock. These were sent to Durham and used in raising *Microplectron* parasites.

The expected sawfly feeding in 1940 failed to materialize. The spring and early summer were unusually cool and unfavorable for hatching and the first generation larval population was light. There were still fewer in the second generation and larvae or sound cocoons were extremely hard to find anywhere in the infested areas. No fully satisfactory explanation has been offered for the sudden drop in sawfly ravages, but it seems definitely related to the disease. On the other hand there was no marked change in the lightly infested areas in New Hampshire during 1940. Slight increases in population were noted on Crotched Mountain in Bennington, North Pack Monadnock and Bald Peak in Hancock, and at Deer Mountain in Pittsburg. It was characteristic of conditions throughout New England that the heaviest populations remain near the outside limits of former heavy infestations, while numbers of sound cocoons decreased sharply in the older, heavily populated areas.

#### Average Number of Spruce Sawfly Cocoons per Sq. Ft.\* Dublin, N. H. (100 samples)

	1939 Spring	1939 Fall	1940 Spring
No. ....	121	206	142
Percentage sound .....	69.9	5.4	2.9

\*Data from U. S. Bureau of Entomology and Plant Quarantine.

This shows that whereas total numbers of cocoons present may be the same or greater, those capable of emerging adult flies has decreased enormously.

#### Natural Control

While the larval disease appears to be the most important cause of this decrease, it is also encouraging to note that recoveries of introduced parasites indicate that these have become established in eight towns and have parasitized a significant number of cocoons. Thus of the first 50,000 cocoons collected in the Monadnock area in the fall of 1939 three to four percent were attacked by the cocoon parasite *Microplectron fusc-*

pennis. The following percentages of cocoons from the one sq. ft. duff samples were thus parasitized:

	1938 Fall	1939 Spring	1939 Fall	1940 Spring
Percent .....	0	0	0.85	0.4

#### Artificial Control

Where trees were sprayed in late May with lead arsenate, spruce trees were protected effectively during the whole season. Observations on the mortality of trees attacked by the sawfly were interrupted by the hurricane, most of the older defoliated trees blowing down. A good many trees have died in the Monadnock area, and more are likely to succumb although it may take several years for the full extent of the damage to be completed.

Rechecks of 84 permanent plots established by this department in 1937 were made in the fall of 1939 with the assistance of WPA project 1890. The results indicated spread of the heavily infested area about ten miles north of Monadnock.

#### What should be done about the Spruce Sawfly in the Future?

The fact that recent activity of the insect has been much reduced should not be interpreted that all danger of injury by this pest is past. Given suitable weather conditions heavy defoliation may occur in new areas and on the outskirts of tracts previously attacked. Therefore owners of spruce woodland should make careful observations in late June and again in late August every year for signs of sawfly activity. Instructions to aid people to know what to look for were prepared in July, 1939.

Liberations of the parasites by the U. S. Bureau of Entomology and Plant Quarantine during 1938 were listed in the last biennial report (Page 103). During the past two seasons these have been made from parasites raised by the State Entomologist at Durham. Dr. J. G. Conklin, Assistant Entomologist, reports the following distribution of the cocoon parasite *Microplectron fuscipennis*:

1939 Town	No. Colonies	No. <i>Microplectron</i>
Dublin .....	36	360,000
Jaffrey .....	10	100,000
Marlboro .....	2	20,000
New Boston .....	2	20,000
Peterborough .....	8	80,000
Pittsburg (Deer Mt.) .....	4	40,000
Pittsburg (As liberated under Mr. Newhall's direction) .....	40	400,000
Sharon .....	5	50,000
Temple .....	13	130,000
Totals .....	120	1,200,000
1940		
Antrim .....	11	110,000
Berlin .....	7	70,000
Dixville .....	2	20,000
Dublin .....	45	450,000
Dummer .....	2	20,000
Francestown .....	25	250,000
Hancock .....	5	50,000
Harrisville .....	11	110,000
Joffrey .....	15	150,000
Keene* .....	7	70,000
Lempster .....	3	30,000
Marlow .....	3	30,000
Milan .....	4	40,000
Nelson .....	8	80,000
Peterborough .....	5	50,000
Pittsburg .....	86	860,000
Stoddard .....	44	440,000
Totals .....	283	2,830,000

\*Of the parasites liberated in Keene, two colonies (20,000) were liberated in a stand of red pine at the Yale Forest; this stand was heavily infested with a pine sawfly (*Neodiprion sp.*).

### Scouting for the European Spruce Sawfly

*Hard to discover.* The reason that early detection of infestations of this insect is important is that it is not conspicuous until present in such numbers that heavy feeding on the trees has progressed to a point where death of the trees may result. Early recognition of outbreaks, and liberation of parasites is the only hope for control in large forested areas at present. The cooperation of everyone who travels the woods is sought in order that outbreaks may be reported promptly.



*Spruce sawfly larvae feeding.*

#### What To Look For

1. *Evidence of feeding.* The small green worms (larvae) eat the older needles first, and only when that is consumed do they attack the new growth. Partially eaten needles, and a general thinning of the foliage



*Spruce sawfly larvae, cocoons and frass.*

when looking up into the tree is suspicious. Other signs of the sawflies will be found where feeding has progressed to this point.

2. *Larvae or greenish worms* about  $\frac{1}{2}$  to  $\frac{3}{4}$  inch long with or without whitish stripes, feeding on the needles, or climbing the trunks of the trees. They are so similar in color to the needles that they may not be noticed unless abundant. They will be found in early July and again in early September in the northern part of New Hampshire.

3. *Droppings or frass* from the worms. These are small cylinders, about the diameter of a pin and about  $\frac{1}{16}$  to  $\frac{1}{32}$  inch long. They are yellowish-green when fresh, changing to greenish-brown.

4. *Cocoons*. The insects spend the winter or dormant season in cylindrical capsules about the size of a .22 rifle shell, chestnut-brown, silky and gleaming. These are found in the duff and under fallen logs and branches partly buried in the duff.

5. *Falling worms and frass*. Where infestations are heavy, these fall from the trees like a light shower. The mature sawflies are hardly distinguishable from deer flies or house flies.

#### How to look for signs of the sawfly

*Shake branches on a white surface*. Because the presence of droppings, and the insects themselves are hard to detect on the branches, a handkerchief held on the outstretched arm, a sheet of white paper, or better still a larger square of white cloth held extended by two sticks should be held under a spruce branch, and the branch then jarred by striking with the other hand or with a club. The droppings are easily seen against the white surface, and the larvae or worms if present will also be shaken off.

*Look under branches and in the moss for cocoons*. Where sawflies are abundant the gleaming chestnut cocoons will be found under branches and sticks one inch or more in diameter which are partially imbedded in the needles on the ground. The gray reindeer lichen, and beneath mosses are also favorite places for the larvae to spin their cocoons. Many are also in the first inch or two of spruce needle duff.

#### What to do if a sawfly infestation is found

1. *Report the location and severity* of the outbreak to the Department of Entomology, Durham, N. H., as soon as possible. Describe the location exactly, sending a sketch map showing how best to reach the area. Show important landmarks. A man from the State Entomologist's office may wish to visit the area, or he may send parasites for you to plant.

2. *Parasite introduction*. If you receive frames of parasites for liberation, set them out *immediately* upon receipt. If necessary to hold them several hours or over night in hot weather keep them cool, preferably in an ice box. Simply set the frame at the base of a spruce in the infested area, and lean it against the stump.

#### Prompt Reports Essential

Remember that insect outbreaks like forest fires start small. The wisdom of stamping out a fire before it spreads over a wide area is recognized. Fires are put out easily when they are reported promptly. Insects cannot be wiped out 100% as easily as fires, but it is just as important to report them before they have gained headway.



LUMBER CUT 1936 TO 1940  
and  
TIMBER SALVAGE REPORT FOR 1939-1940

W. H. TRIPP



WING to the serious damage to timber and young growth during the hurricane of September, 1938, the report of the lumber cut for 1939 will necessarily show a very large increase. Approximately as much was cut during the year 1939 as the total cut for the six previous years. The following table gives the total cut exclusive of pulpwood, during the past five years as reported to this department:

Lumber Cut

Year	Number Reporting	Cut of Hardwoods	Cut of Spruce	Cut of Other Softwoods	Cut of Pine	Total
1936	100	17,701 M	13,094 M	12,637 M	71,027 M	114,459 M
1937	122	28,620 M	13,684 M	15,135 M	96,078 M	153,517 M
1938	164	22,396 M	9,322 M	14,951 M	77,913 M	124,582 M
1939	361	39,283 M	27,920 M	18,646 M	144,047 M	229,896 M
1940	239	30,964 M	25,285 M	13,624 M	96,435 M	166,308 M
						788,762 M

The total cut of hurricane logs purchased by the New England Timber Salvage Administration from 5,973 forest owners delivered to 530 designated receiving sites is as follows:

1939	373,363 M
1940	29,116 M
Total	402,479 M

Break-down by species and pulp purchased by NETSA to December 31, 1940:

Hardwoods	7,226 M
Spruce	10,257 M
Fir	224 M
Hemlock	15,610 M
Pine	369,162 M
Total	402,479 M
Pulpwood	29,091 cords

It may be noted that of the 361 timber owners reporting their cut to the state for the year 1939, at least 220 could not be classed as regular operators, as their names were not shown on previous lists, but were those who operated their own blow-down timber. Of this group 22 reports came from counties, towns, schools, churches and public utilities. The total cut shown on the 220 cards not classed as regular operators was 65,496 M. The cards of the 141 regular listed operators showed a cut of 164,400 M, which is about 34,000 M in excess of the previous three-year average.

The total lumber cut for 1939 including salvage timber purchased by NETSA was 603,259 M which is about 472,400 M more than the previous three-year average and with one exception was the largest cut in New Hampshire during the past 70 years. The census report for 1907 gave a total of 754,023 M.

The total lumber cut for 1940 including salvage timber purchased by NETSA which was concluded May 29, 1940 was 195,424 M.

It should be understood that the lumber cut figures given above do not include the cut of pulpwood or cordwood, the former having steadily increased during recent years, especially hardwood for pulp. Neither do



the above figures include the salvage of 70,000 M of lumber and pulp from the White Mountain National Forest during 1939 and 1940. Since the hurricane the regular and salvage cut of both hard and softwood for pulp in much of the three northern counties has been the major forest production. Except for about 29,000 cords purchased by NETSA during 1939 and 1940, the pulpwood cut has been disposed of directly to private industry.

Attempts have been made to estimate the amount of blown-down timber salvaged by private agencies. It is probable that most of the 65,496 M cut by other than regular operators was salvage timber which found its way into private markets. Presumably the 141 regular listed operators reporting to the state a cut of 164,400 M in 1939 cut mostly down timber and sold through customary channels. The NETSA estimate of 200,000 M of hurricane timber privately salvaged to December 31, 1940 is probably reasonably correct and largely applicable to 1939. By 1940 private operators were cutting standing timber for the most part. Many timber lots containing down timber were sold as a whole and the operators would have no separate records of the cut when made along with standing timber.



*More than two-thirds of all hurricane-felled timber was white pine.*

## TIMBER SALVAGE ON STATE LAND

L. N. WATSON



THE clean-up and logging of hurricane-damaged timber on state lands was started early in the winter of 1939. These operations were carried on largely by contractors who contracted to cut, yard and haul the logs or wood to federal mills or storage sites. A few small lots of logs were sold to private individuals and 843 cords of spruce pulp was sold on the stump in Crawford Notch to the Parker Young Company of Lincoln, N. H. Cull logs which could not be delivered to the government were salvaged on six state forests. These areas were the Monadnock Reservation where 35 M were sold to a private individual, while on the Fox, Nursery, Pawtuckaway and Wadleigh Park areas, 50, 11, 8, and 17 M feet of timber respectively were sawn into boards and dimension stock and held for future state use. The Warner CCC Camp salvaged 100 M feet of logs from the Harriman-Chandler Reservation which has been sawn and held for future CCC use on state projects.

Extensive clean-up or hazard reduction was accomplished on many state areas which are used extensively by the public. The most of this work was done by CCC crews while civilian labor was used at the Fox, Nursery and Pawtuckaway Reservations.

The following table shows the income or loss due to these operations on 25 state forests and reservations to December 31, 1940. The losses shown against the Fox, Nursery and Pawtuckaway Reservations are due to using civilian labor on fire hazard clean-up. The figures shown for some tracts are incomplete and will need to be given again in a later report when all operations have been completed.

### STATE FORESTS—TIMBER SALVAGE—JANUARY 1, 1939 TO DECEMBER 31, 1940

<i>Forest</i>	<i>Costs</i>	<i>Income</i>	<i>Inv. and Accts. Rec.</i>	<i>Pro. and Loss Dec. 31, 1940</i>
Black .....	\$731.64	\$765.75	.....	\$34.11
Casalis .....	2,854.53	3,254.26	.....	399.73
Clough .....	1,475.21	2,005.65	.....	530.44
Contoocook .....	225.60	234.50	.....	8.90
Crawford Notch .....	.....	914.69	.....	914.69
Fay .....	.....	8.50	.....	8.50
Forest Lake .....	16.10	62.24	.....	46.14
Fox .....	19,671.60	16,594.14	\$2,063.59	1,013.87—
Franconia Notch .....	3,579.74	3,752.04	.....	172.30
Haven .....	6,231.09	8,999.79	.....	2,768.70
Hemenway .....	3,549.97	4,838.24	.....	1,288.27
Honey Brook .....	249.31	399.31	.....	150.00
Lord .....	169.30	338.28	.....	168.98
Mascoma .....	4.00	.....	.....	4.00—
Mast Yard .....	4.00	.....	.....	4.00—
Meadow Pond .....	277.64	294.62	.....	16.98
Monadnock .....	13,324.45	15,903.50	.....	2,579.07
Nursery .....	1,449.10	323.41	.....	1,125.69—
Pawtuckaway .....	384.35	.....	.....	384.35—
Peterborough .....	75.00	187.43	.....	112.43
Stevens .....	44.80	50.25	.....	5.45
Stockdale .....	280.00	409.69	.....	129.69
Sugar Hill .....	1,388.20	573.25	1,496.00	681.05
Wadleigh .....	2,226.22	3,008.89	.....	782.67
Walker .....	670.99	794.36	.....	123.37
Wellington .....	1,106.64	1,558.49	.....	451.85
Wentworth .....	162.92	230.24	.....	67.32
Administrative .....	543.74	.....	.....	543.74—
<b>Total .....</b>	<b>\$60,696.12</b>	<b>\$65,501.52</b>	<b>\$3,559.59</b>	<b>\$8,364.99</b>

## STATE APPROPRIATION ITEMS

The annual reports of the State Comptroller and State Treasurer give in detail a financial statement of revenue, appropriations and special funds of the department. The following is a statement of the budget appropriation items:

July 1, 1938 — June 30, 1939

	<i>Appropriation</i>	<i>Expenditures</i>	<i>Reserved For Bills Payable</i>
Administration .....	\$16,825.00	\$16,825.00	
Nursery .....	6,595.00	6,595.00	
Reforestation .....	1,480.00	1,480.00	
District Chiefs .....	6,345.00	6,345.00	
Lookout Stations .....	10,026.75	10,026.75	
Prevention of Forest Fires .....	2,450.00	2,450.00	
Forest Fire Bills to Towns .....	7,500.00	3,773.57	\$3,726.43
White Pine Blister Rust .....	5,388.51	5,098.42	290.09
Recreational Development:			
Appropriation .....	13,150.00		
Income .....	15,122.57		
Balance 1938 income .....	48.23	28,320.80	
Timber Salvage .....	24,244.15	24,244.15	
Federal Emergency Program .....	4,100.00	4,100.00	
Old Year Reserve .....	3,586.25	1,703.60	
	<u>\$116,861.46</u>	<u>\$110,962.29</u>	<u>\$4,016.52</u>

July 1, 1939 — June 30, 1940

	<i>Appropriation</i>	<i>Expenditures</i>	<i>Reserved For Bills Payable</i>	<i>Appropriation Balances Available June 30, 1941</i>
Administration .....	\$18,200.00	\$18,020.10	\$176.22	
Nursery .....	7,440.00	7,439.44		
Reforestation .....	1,900.00	1,899.92		
District Chiefs .....	7,115.00	7,115.00		
Lookout Stations .....	10,000.00	10,000.00		
Prevention of Forest Fires .....	4,800.00	4,800.00		
Forest Fire Bills to Towns .....	7,500.00	7,500.00		
White Pine Blister Rust .....	4,843.00*	4,182.68	660.32	
Emergency Forest Fire .....	100,000.00	43,855.66		\$56,144.34
Recreational Development:				
Appropriation .....	15,083.00			
Income .....	17,964.88	32,047.88		310.89
Emergency Timber Salvage .....	8,000.00			
Executive Branch Emergency Fund ..	3,000.00	10,221.82		
Federal Emergency Program .....	6,000.00	4,766.31		
Old Year Reserve .....	4,036.52**	4,036.43		
	<u>\$215,882.40</u>	<u>\$155,885.24</u>	<u>\$836.54</u>	<u>\$56,455.23</u>

\*Transfer to Old Year Reserve \$20.00

\*\*Transfer from White Pine Blister Rust Control \$20.00