

Taft Ski Trail on Profile Mountain.

State of New Hampshire

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BIENNIAL REPORT

of the

FORESTRY COMMISSION

For the Two Fiscal Years
Ending June 30, 1933-34

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CONCORD
.1935

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REPORT

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

The Forestry Commission submits herewith a summary of the activities of the Forestry Department for the two fiscal years ending June 30, 1934, and the full report with detailed records of costs and descriptions of the various accomplishments. As heretofore, the subject matter described in the report has been made to conform as nearly as possible to the calendar years 1933 and 1934 in order to include the two complete working years and bring events to the close of the administrative period. Information relating to the fall of 1932 appeared in the last biennial report.

During the last two years with their train of made work programs, the Forestry Department has maintained the forest fire service and other regular work which have been its chief efforts for many years and at the same time greatly expanded the program of public land development to meet the emergency demands of the State and Federal Governments. The small permanent staff has had to give much of its time to the complex mass of details connected with the various emergency work projects. Lack of time has made it impossible to give the usual number of addresses before groups and organizations and to keep the public informed about forestry matters. The quarterly publication entitled "New Hampshire Forests" has been discontinued during this period.

In the last fiscal year ending June 30, 1934 the Forestry Department has been entrusted to plan and conduct a variety of work programs both regular and emergency, the

exact costs of which so far as the Department was responsible for the expenditures amounted to \$689,867.39 as follows:

Federal:	Emergency Conservation Work (CCC)	\$190,311.00
	Civil Works Administration	227,949.97
	Blister Rust Control, regular and special	52,185.91
	Clarke-McNary fire and planting fund	14,767.73
State:	Forestry Department appropriation	64,828.37
	Sec. 7, Chapter 150, Laws 1933	96,057.79
	Sec. 8, Chapter 150, Laws 1933	21,149.51
	Fox Trust fund	3,697.25
	Forest improvement fund	3,631.56
	Casalis fund	33.29
Towns:	Forest Fires	6,385.81
	Blister Rust	8,869.20
		<hr/>
		\$689,867.39

The cost of the above program to the State was about 27% of this total. The CCC cost indicated above does not include expenditures by the Army and other Federal agencies in the conduct of the camps and pay and subsistence of enrollees. At least 5,000 persons were employed during the year, largely through Federal and State relief and unemployment agencies and including CCC enrollees. The program of work and expenditures now under way and to be carried out by the Forestry Department during the present fiscal year ending June 30, 1935 are likely to equal or exceed those of the last fiscal year. This responsibility has not been accepted lightly. The opportunity to help relieve unemployment and at the same time accomplish worthwhile results to New Hampshire forestry and recreation have been constantly before us.

A diagram is attached herewith to show our present organization under the Forestry Commission and State Forester. Of the five major divisions indicated, research in forest management has come to the Department within two

W. R. BROWN
B. K. AYERS
H. K. ROGERS

OFFICE
W.J. AHERN - Chief
C.S. Parker - Clerk

**FOREST FIRE
SERVICE**

EJ.COUTURE

Office Administration
A. J. Roy, Clerk

**BLISTER RUST
CONTROL**

L.E. NEWMAN

Agent
I. W. Nobody, Clerk

EFFORESTATION

L. N. WATSON

<p>State Forest Nursery Forest tree production and distribution Seed collection Nursery & Planting Foreman & Crews</p>	<p>Forest Improvement <i>(State, town & private)</i> Forest Planting Forest Products C.C. Parsonnel</p>
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STATE FORESTS & RESERVATIONS
Forest Management & Recreational Use

Forest Management & Recreational Use

WF:HALE

**Acquisition
Survays & Mapping
Rentals
Forest Fires
Town Forests**

W.H. TRIPP

*Buildings
Roads & Trails
Parking Areas
Dorms, etc.
E.C.W. Property Custodian*

FOREST
RESEARCH

HILBALDWIN

Fox Research & Demonstration Forest

District Chiefs

J. W. Keenan
W. H. Tripp
E. L. Woodbury
C. E. Young

District Federal

Agnesis
F. J. Baker
S. M. Boerner
T. L. Kane
T. J. King
G. F. Richardson
L. C. Swain

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[illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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Researcher
Care taken
Life guards

Civilian Conservation Corps

Five Forest Camps - One Park Camp

Q.A. Yarwood, Landscape Architect
c/o R. Harford, Clerk
N.E. Edwards, Asst. Clerk

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Fire Warden Service
Town Warden & Deputies
Lookout Station Watchmen
R.R. Section Foremen
State Highway Patrolmen

years from the Caroline A. Fox Trust with an income of about \$6,000 yearly to support the work. Recreational use and enjoyment of the State's public reservations now occupies and should continue to occupy an important division of the work. Because so many improvements and developments were possible to meet public needs, a considerable part of the work programs and emergency efforts has been used to further recreation on State owned land.

The regular work of forest fire control, protection of white pine from the blister rust disease and the production, distribution and planting of forest trees have gone forward with marked progress due to the financial help and man power made available. The construction of 43 miles of new pole telephone lines, several new cabins for fire lookout watchmen, one combined structure to serve as fire lookout and shelter for the public on Great Hill in the Hemenway Reservation in Tamworth, besides two other secondary fire lookouts and about 58 water holes, represent a contribution to our forest fire service by the CCC camps. Boys from these camps also rendered fire fighting service within reach of their headquarters to the amount of 1,853 man days, with a consequent saving in cost to the towns and State.

Several notable fires occurred during the biennial period but the record as a whole was good. A bad fire in Merri-mack occurred in May, 1933, causing damage of over \$30,000. Other large 1933 fires occurred in Hooksett and Alton. In July, 1934, a fire in Marlboro threatened Monadnock Mountain and burned 275 acres before being brought under control. Except for comparatively short periods of dry weather, the fire seasons were favored by fairly good fire weather with good rains and cool temperatures. Woodlands were closed by gubernatorial proclamation only once during the biennium in the three northern counties on June 6, 1934. This closure was partially suspended June 8th and wholly lifted on June 13th. In the following July, a short "ban" was in effect in the seven central and southern coun-

ties from the 26th to the 28th. The total number of fires reported was 912 and 10,405 acres were burned.

The demand for water pumping equipment and the purchase of such equipment by towns, the small hand types as well as motor pumps, for use with or separate from fire trucks, has steadily increased. Towns are conscious of the importance of available water supplies for the use of modern equipment in protecting both building and forest property. Water hole construction has proven its value in rural sections and over 500 of them have been built to give men employment in more than 100 towns from the Forestry Department's emergency funds in addition to water holes constructed under the Federal CWA, by the CCC camps and by some towns on their own initiative. Certain large fire hazardous sections of the state were given CWA and other relief help to brush out abandoned woods roads so that motor fire equipment could be taken to otherwise unusable supplies of water for fire fighting purposes.

Never before have the forest fire wardens shown greater interest and responsibility in their difficult tasks which are not fully appreciated by the public. During the two-year period, county groups or associations have been voluntarily organized in Cheshire, Hillsboro and Rockingham counties which bring together members from many different towns monthly during the year for the betterment of the service. It is not uncommon to find a hundred or more wardens and deputies attending one of these meetings.

Our state supervision of forest fire matters has been strengthened by arrangements to use five federal blister rust agents part time on this work. Clarence S. Herr, Extension Service Forester at Lancaster, co-operates in the supervision of fire work in some of the upper Connecticut Valley towns. The Department continues to employ one district fire chief jointly with the New Hampshire Timberland Owners' Association in northern Coos County.

Blister Rust Control in all towns where initial work was uncompleted has continued through two seasons almost entirely as an emergency measure. No towns were asked to

pay for work but thirty towns did so voluntarily in the two-year period. Eradication of currants and gooseberries was done to the extent of 185,624 acres in 82 towns during the two seasons, using the CCC, a special Federal allotment for the purpose and the Department's emergency appropriation.

As an unemployment relief measure, blister rust eradication requires little but labor and supervision and has worked very well, although at some sacrifice of speed and accuracy as compared with work done during earlier years. There has never been a time, however, when control measures were more urgent or relief labor so available as now. The Federal Bureau of Entomology and Plant Quarantine has spent at least \$20,000 annually for many years in the employment of blister rust agents to co-operate with New Hampshire in this control work. They will expect that the towns and State will continue a reasonable program of ribes eradication and supervision in order to justify the Federal co-operation.

The production and distribution of trees from the State Nursery has proceeded in the usual manner. The output for the two years was 2,236,000 trees. All the trees that the State Nursery produced and was unable to distribute by sale or gift to public agencies and boys' clubs, found a place on public lands. The total plantings on State land were 933,500 trees and on town lands 359,540 which is 66% more than have been planted on public lands in any similar period before. Club agents of the Extension Service, Agricultural high schools and Boy Scout troops were given 595,627 trees for planting by their members on their home farm woodlands.

Public Reservations

The Forestry Department has under its jurisdiction 98 state forests and reservations, small and large, with a total acreage of 38,016 acres. These lands have been acquired beginning in 1891 but mostly during the last 25 years. Excepting the major purchases, Crawford and Franconia Notches,

and the White Lake purchase last year, all by acts of the Legislature, they have been acquired by gift and purchase in relatively small areas under authority given to the Forestry Commission and the Governor and Council. For a number of years prior to 1927, an appropriation of \$5,000 per year was received for the purchase of land. Most of the larger and more valuable tracts such as Monadnock, Pillsbury, Hemenway, Wellington Beach, Fox Research Forest and others have been splendid gifts to which many will bear testimony.

During the last biennial period about 4,293 acres came into State ownership through the Forestry Department in 23 different areas, one-half of which were gifts. One of the most important gifts was Wadleigh Park of 52 acres on Kezar Lake from the Village Improvement Society, Society for Protection of New Hampshire Forests and the Town of Sutton. Another gift of much historical value was the Governor Wentworth Farm in Wolfeboro, 98 acres of woodland and open pastures, including the site of the old mansion house of pre-Revolutionary days. There were also gifts of 16 acres on Lake Wentworth not far from the Governor Wentworth Farm by the Town of Wolfeboro and two acres adjacent to Endicott Rock at The Weirs, Lake Winnepesaukee, by the City of Laconia, all having been made in order to bring about State control and improvements needed by the public. An area of over 1,400 acres in Freedom was a gift in memory of the late S. O. Huckins as a forest reservation and for fish rearing pool development.

Areas were acquired by purchase with funds supplied by the Governor and Council under Chapter 150, Laws of 1933, for recreational development and other forest work projects in the emergency programs. The most important of the recreational purchases were 420 acres on Forest Lake in Whitefield and Dalton, 44 acres on Kingston Lake in Kingston, and 755 acres for the Moose Brook CCC development in Gorham. Other purchases were two CCC camp sites of 18 and 17 acres respectively in Goshen and Danbury and 240

acres in connection with the FERA transient camp on the Black Mountain State Forest in Haverhill, 122 acres on Milan Hill in Milan and 47 acres on Rock Rimmon in Kingston, the last two in use for fire lookout purposes and after development to serve both fire protection and recreational use. An area of 153 acres adjacent to the Pawtuckaway Reservation was purchased for needed gravel and wood for the CCC camp and as an addition to the reservation. Funds for purchase of all except the Dover and Peterboro areas were allotted to the Forestry Department.

In the earlier years there were almost no funds with which to survey or improve State lands but the legislature has provided a small amount for planting each year and eight years ago income from the sale of products was made available in continuing improvement fund. These lands were for forest production and demonstration but wherever an important scenic area was secured or some recreational value to the public was revealed, we were anxious at least to provide means for the public to reach it. This led to the cutting of trails and later providing parking places for cars, waste barrels, signs and markers. Occasionally an entrance roadway leading to some important objective was constructed. In this manner recreational use of our state reservations has grown with the years. Amendments to the forest laws from time to time were necessary. The right to make rules and regulations, to lease concessions and to use income for improvement work are some of these amendments. During the last two or three years because of the unemployment funds available, the Forestry Department and other work agencies have made much progress in developing the recreational possibilities of state and also town and municipal lands.

Unemployment Relief and CCC Work

The winter of 1932-33 found many thousands of unemployed and needy people demanding work or public aid. The State forests and reservations which had already contributed useful work in forest improvement and wood cutting projects

with free wood to the towns for relief could continue doing so almost indefinitely. The Governor and Council made \$18,000 available from State and Federal emergency funds during that fall and winter.

In the meantime events were transpiring of a nature which none could have foreseen and which marked the beginning of an important emergency legislative program of the State and also of co-operation with the Federal Administration on a scale more comprehensive for forestry than could possibly have been imagined. While the 1933 legislature was considering and afterwards passed, Chapter 150 providing for emergency relief or unemployment and appropriating among other measures \$100,000 each year to be expended by the Forestry Department in furnishing work on public forests and for forest protection, the Federal Government was entering upon the Emergency Conservation Work passed by Congress, March 31, 1933, and commonly known as the CCC. In addition to seven CCC camps on the White Mountain National Forest under Federal supervision, the Forestry Department was granted five 200 man camps by the Federal Forest Service for work on State and town forests and for forest fire protection and pest control. A year later a veteran's camp of the National Park Service was also allotted to the Forestry Department for developing the Moose Brook recreational area in Gorham.

Officers of the Army are responsible for the conduct and management of all these camps and the Federal Labor Department and relief administrators supply the enrolled men. Of the \$30 per month pay received by enrollees, \$25 goes to parents of those not of age, thus helping greatly to reduce the relief load. New Hampshire's quota on a population basis has been 1,000 men, the others coming from outside the State. Responsibility for the work projects and the enrolled men during working hours, also equipment, tools and materials at each camp is given to a project superintendent and about ten foremen who are employed and supervised by the State Forester and his regular assistants who also plan the work projects subject to approval by Federal inspectors

of the Forest and Park Services. It is expected that the present State camps will be continued and several new camps established after April 1, 1935 by further action of Congress. What has been accomplished by the CCC camps cannot be briefly described and much of it as yet is not fully comprehended by the general public. Allowable projects which can be reached in a radius of about 25 miles from each camp have been or are being done by the CCC. In addition certain temporary side camps have been authorized where 25 or more enrollees under state supervision are stationed for work outside the transportation limits of the base camps. By this means it has been possible to undertake a few CCC projects 50 or more miles from the base camps.

The cost of the CCC work has been borne by the Federal Government, up to certain limitations for overhead, materials and equipment, and includes the supervisory personnel at each camp and a landscape architect, clerk and assistant clerk at the headquarters of the Forestry Department in Concord. The Department has had to supply the state supervision by its regular staff, certain office administration, travelling expenses of special agents, materials necessary to have but not allowed from Federal funds and has also paid for ski trail and other surveys and for office and field map work. It has been necessary to purchase certain areas of land adjacent to State reservations where important work projects were in progress or where projects were especially needed and also land upon which two of the CCC camps are located, the others being on state or town owned land. The Government expects the states to contribute to some extent financially and to share any profits resulting from the sale of land or products resulting from the work of the CCC. So far all products have been used by the camps or donated to relief.

During 1933 surveys of state lands and possible work projects, those already finished, those which could be handled by CCC camps and those too far removed, have been necessary in order to properly plan the CCC work and also in order to be ready to put other men to work on worthwhile state projects when and as relief and re-employment agents

indicated distressed conditions in various localities. The Forestry staff was engaged in this survey and planning work and with the organization of the CCC until fall. A forest market study was started and proposed routes for ski trails examined and laid out. A full season of blister rust eradication was conducted. The Forest Lake dam in Whitefield was rebuilt, also two miles of road constructed. In general, however, the summer and fall of 1933 was a period of investigation and preparation for what was to follow.

In November, the Federal CWA work was launched. Cooperation by the Forestry Department was requested to the extent of putting about 1,500 men to work immediately. District fire chiefs and blister rust control agents were pressed into this emergency service as supervisors to organize the local crews. Public land work took precedence but it was impossible to employ upwards of 150 crews of ten men each wholly or even largely on state or town land. New work projects had to be determined, written up and approved. Town officials and others were contacted and work details arranged. There could be no delay. The first week ending November 23, 1933 there were 84 forestry crews at work and the second week 124 crews. During the third week the Forestry Department released 78 crews to Professor W. C. O'Kane of the State University for work on brown tail moth control, together with foremen and state supervisors and replaced these crews with 63 new crews of 10 men each. Much of the work consisted of roadside improvement, forest fire hazard reduction, improvement of town water supplies and cemeteries, moth control and many other projects normally carried on by towns when funds permitted. The CWA work ended March 29, 1934.

With the termination of CWA many men were returned to unemployment or relief. Our state emergency projects which had barely started during the previous fall were launched on a comprehensive scale. The demand for work was so great that state land improvement projects were started wherever work was sufficiently near the distressed towns and not already allotted to CCC camps. A total of 30

state reservations widely scattered received the benefit of this work which was mainly forest improvement and cordwood cutting for local relief use and arranged to meet relief needs. Town forest improvement projects were carried on from both the CCC and state emergency set-ups wherever they were available and worthwhile work could be done. The Department entered into co-operation with 56 towns in the construction of water holes for forest and building fire protection and paid for the labor to the extent of \$320 per town. With the spring forest fire, blister rust and planting seasons coming on, the State Forestry staff was hard pressed to take care of the regular and emergency work, including supervision of the CCC camps.

Recreational Areas and Bathing Beaches

The Forestry Department has also undertaken many recreational projects including roadways, dams, bridges, ski trails, filling and grading for parking spaces, caretaker and rest room buildings, new or enlarged bath houses, water supplies, toilets, septic tanks, summer houses and shelters and various picnic or camping facilities to meet the particular needs at each of the following State reservations: Wellington Beach on Newfound Lake in Bristol, White Lake in Tamworth, purchased by special act of the 1933 legislature, Monadnock in Jaffrey, Crawford and Franconia Notches, Clough Reservation in Weare, Pillsbury in Washington, Pawtuckaway in Deerfield and Nottingham, Hemenway in Tamworth, Governor Wentworth Farm in Wolfeboro, Fox Reservation in Hillsboro and Moose Brook in Gorham.

Numerous other State reservations have had more or less important recreational projects completed or under way, among which are the following: Construction of a dam at the State Nursery in Boscawen, repairing of the Miller Park road on Pack Monadnock in Peterboro, Cardigan Mountain roads in Alexandria and Orange, Mt. Willard road in Crawford Notch and construction of new service roads on Mt. Belknap in Gilford and Cathedral Ledge in Conway; roadside camp grounds on the Honey Brook in Acworth and

Merrimack River in Boscawen and picnic areas and road work at the Winslow site on Mt. Kearsarge and Pulpit Rock in Bedford. About 20 miles of important ski trails have been built by the Forestry Department, largely with CCC help at Franconia Notch, Kearsarge, Cardigan, Merriman, Forest Lake, Pawtuckaway and other reservations. It is expected that work on all unfinished projects will continue another year under CCC or as state projects. Plans are under way for bath house construction at Endicott Rock, Weirs, in the spring of 1935.

The following table gives a condensed summary of the principal work accomplishments by the Forestry Department during eighteen months to December 31, 1934:

WORK ACCOMPLISHMENTS
JULY 1, 1933 TO DECEMBER 31, 1934

		FEDERAL FUNDS			STATE FUNDS Towns Co-operating	Total
		000	OWA	Clarke-McNary		
Beach improvement	acres	71	...	...	...	71
Blister rust control	acres	65,754	...	...	85,991	185,624*
Bridges—vehicle	no.	10	1	...	8	19
Bridges—foot	no.	2	2	...	11	15
Brown tail webs	no.	...	544,734	...	...	544,734
Buildings and repair	no.	40	4	...	6	50
Camp ground clearing	acres	49	...	...	4	53
Cemeteries improved	acres	...	23	...	1	24
Cordwood cut	cds.	6,592	7,414	...	1,430	15,436
Dams built	no.	4	...	...	8	12
Earth fill	cu.yds.	1,800	...	...	675	2,475
Fences built	ft.	...	850	...	6,060	6,910
Fire fighting	days	1,853	...	...	...	1,853
Fire hazard reduction	acres	640	85	...	104	829
Fire lines	miles	5	71	...	1	77
Forest improvement—town	acres	...	693	...	...	693
Forest improvement—state	acres	2,231	708	...	914	3,853
Forest planting	acres	556	...	...	203	759
Gypsy egg masses	no.	...	1,439,000	...	...	1,439,000
Landscaping of parks	acres	2	130	...	4	136
Lookout building repairs	no.	3	...	10	...	13
Lookout towers	no.	1	...	2	2	5
Roadside improvement	miles	33.6	568	...	7.4	609
Seed collection	bushels	87	...	...	...	87
Surveys—ground water	acres	60	...	...	...	60
" lineal	miles	296	...	...	...	296
" timber	acres	25,931	...	...	...	25,931
" topographic	acres	5,711	...	...	...	5,711
Telephone lines	miles	21	...	22	...	43
Trails—foot	miles	29	...	...	14	43
" ski	miles	20	...	...	...	20
" truck	miles	35	...	...	7	42
" wood roads	miles	17	...	...	...	17
Trailside improvement	miles	8	...	...	...	8
Trees planted	no.	587,000	...	...	155,200	742,200
Water holes	no.	58	19	...	514	591
Water pipe systems	feet	7,340	315	...	2,250	9,950

*33,879 additional acres covered by NRA.

Prior to the beginning of CWA work, Governor Winant appointed B. K. Ayers of the Forestry Commission as advisor on the development of certain state and municipal recreational areas, working with L. H. Weir of the National Recreation Association. Many plans were formulated and when CWA funds became available from the Federal Government, were put into execution. Work continued until the close of the CWA program in March and then through the 1934 season under FERA engineers. Among these projects were six bathing beach or outdoor pool areas acquired by the State for this purpose. The Forestry Department had little to do with the development of these projects. Four of the bathing beaches, namely, Wentworth Lake, Forest Lake, Kingston Lake and Wadleigh Park, were turned over to the Forestry Department for administration as they were completed or available for use by the public during the season. Work done on them under CWA and FERA included the building of modern bath houses with rest room, fireplace, running water, electricity, sanitary toilets, septic tanks and sewage disposal and other structures, also much filling, grading, landscaping of grounds, all of which promise to be of great public value and use for bothing and other forms of summer and winter recreation. Certain unfinished but necessary work on the grounds at Wentworth Lake and Forest Lake will be done by the Department. Caretaker cottages at Kingston Lake and Wadleigh Park have already been constructed by the Department.

Two other state recreational areas, Bellamy Park, Dover and the Peterboro pool, were partially developed by CWA and FERA but were not finished or available for use last season and they have not been placed under definite administration. The former has a new dam and one bleacher constructed for the athletic field. The latter has a cement swimming pool with chlorinating plant. Bath houses, sanitary toilets and other structures and improvements to the grounds are needed at both places and will be undertaken by CCC or other means next season. Still other CWA and FERA pro-

jects of a similar nature on municipal lands in Manchester and elsewhere offer problems of ways and means to have the work completed and of future control and management by the municipalities themselves.

Recreational Use of State Reservations

During the 1934 season the Forestry Department operated nine bathing beach areas, five with qualified lifeguards and all having caretakers in addition to or in place of lifeguards full or part time. There were eight other recreational areas having no bathing but so many visitors as to require supervision of the premises either full or part time. The presence of CCC crews and foremen the past season or two have made it unnecessary to have other caretakers on three of these areas. Two caretakers served also as fire lookouts. Another year Moose Brook and Pillsbury will be available for public bathing. Registrations of visitors at nine of the improved recreational areas, not including Franconia and Crawford Notches, totalled 167,000 last season. No charges have been made for use of facilities and no income has been received from them. The above indicates in a general way the growing use and possibilities of our public recreational areas. They should be expanded moderately as their value is understood and appreciated.

Our state forests and reservations can serve to an increasing degree both forestry and recreation and they should continue to be administered so as to insure economy in employment of men and close co-operation among those responsible for these services. It is often possible to have an employee work on more than one kind of project and to distribute the cost accordingly. Many years have been required to build up a field organization most of whom are employed only part time or partly at the expense of the Federal Government and other co-operating agencies and in a manner to bring about satisfactory service at the least possible expense to the state. Some of the finest gifts of lands to the state were primarily made for forest purposes. Forestry gains in an edu-

cational way when recreational areas are a part of well managed demonstration forests which the public would not visit except to take advantage of recreational facilities offered.

Recreational use of our state reservations is already provided for under the Forestry Commission and State Forester and no changes in the law are necessary to bring this about. The budget for the next two years, already submitted, is expected to take care of the department's necessary recreational expenses. Expansion of the organization will be necessary to take care of the varied and complex recreational and land use problems which are likely to arise in the future. It is impossible to determine now what even the next two years may bring to pass with so many plans and proposals being considered in Washington, and with the likelihood of so much Federal money being spent for public work to relieve unemployment. The Forestry Department is in close contact with Federal Forest, Park and Land Program authorities in whatever projects are now going on or likely to be undertaken.

The question of securing income from the more intensively used recreational areas to help maintain caretakers, life guards, etc., is important. The public should continue to have free access to and use of our recreational facilities but some income can be obtained from fees for locker space, basket checking of clothes, sale of needed accommodations, etc. If we take a moderate position about income, there should be no public criticism or hardship created and some revenue will be secured to reduce cost of maintenance. It should be expected that income will help to support but not pay all the costs of maintenance of these recreational areas. There is need for amendment to the public land laws if the Forestry Commission is to be specifically authorized to make charges to the public for use of the state's recreational facilities.

Public land development, though seemingly rapid in the past two years, is still small compared with that in most other states and for a state where recreation forms so large a part of the total industry as it does in New Hampshire. The improvements made have long been needed but could

not be accomplished before through lack of funds. In Massachusetts and Connecticut with greater areas of state and municipal land and larger grants of funds for unemployed work projects and CCC camps, the recreational objectives are no less than to provide camping and picnic areas, bathing beaches or pools, playfields and the like within reach of every community. For this purpose Massachusetts has launched a ten-year program to acquire as much as 300,000 acres of additional State lands. Maine is making accessible and available the great wilderness area of the Katahdin region. Vermont is carrying out a recreational program throughout the state by use of some 14 CCC camps and with special reference to making Vermont attractive to the summer tourists. Farther away, New York, New Jersey, Pennsylvania and many other states are striving to provide their own citizens with the means of outdoor enjoyment without going far away or out of the state and to attract visitors from other states. The Shenandoah and other National and State Park developments in the mountain and tidewater sections of Virginia, the Smoky Mountains Park in North Carolina and Tennessee, the park systems of Long Island, the Catskills and the Adirondacks of New York and marvelous developments in Ohio, Indiana, and the Great Lakes states all mean that these states are alive to the importance of public recreation. They will have the effect of satisfying and keeping at home many vacationists who would otherwise travel greater distances in search of outdoor enjoyment.

New Hampshire is unique in its combination of mountain and lake scenery but most other states also enjoy scenic attractiveness and with facilities for the entertainment of the public, there will be a tendency for the yearly pilgrimages to centers like New Hampshire to lessen. With splendid highways to every section of this country, people are more likely than ever before to spend their vacations in different regions. New Hampshire cannot afford to be backward in providing public playgrounds if it hopes to increase or even to maintain its standing as a recreational state.

Public Land Acquisition

The Federal Government's emergency conservation, sub-marginal land use and other work relief programs in co-operation with the states will undoubtedly be continued and are likely to make many new advances and demands decidedly to our advantage to accept. Under FERA a federal land purchase program is under way to permit farm owners in one or several localities to reestablish themselves in more favorable surroundings and to devote the land so acquired to permanent forest use and recreational demonstration. The plan is to offer to purchase such areas and assist the owners who wish to do so to move to better locations on good roads, improve their living conditions thereby, and benefit the community by reducing road maintenance and school expenses and by the attractions provided. One of the important purposes is to provide camping and vacation facilities to under-privileged people from industrial sections who have no means of paying for or reaching similar benefits offered to the public elsewhere. Land so purchased would be turned over to the State for forest production, recreation and wild life purposes, except when such lands might become a part of the National Forest.

Improvement work to be done upon these areas is not promised by the Federal Government but is likely to be available through CCC camps, work relief or otherwise to make them useful and attractive, such as roads, trails, dams, buildings, playgrounds, etc. Groups of buildings might be constructed for use by organizations or welfare societies as recreational places for needy people. The State would be expected to accept these areas either improved or otherwise and to supervise and administer them but not to make definite commitments other than to keep and maintain the property for the general purposes intended. Congress has given no authority to deed these lands to the State and until this is done areas purchased would be leased to the State for a long period at a nominal rental.

The Federal sub-marginal land authorities during the present year have co-operated with the Forestry Department, Extension Service, Planning Board and other State agencies and with the Park Service of the United States Department of the Interior in the selection of a sub-marginal area called the Bear Brook Area in portions of the towns of Deerfield, Allenstown, Candia and Hooksett as meeting the sub-marginal requirements and also having important forest and recreational possibilities. Property surveys and a plan of recreational improvement have been made and options to purchase have been secured for about 8,000 acres. This area may be extended so as to embrace as much as 15,000 or more acres.

Preliminary examinations only have been made of two other widely separated areas in Southern New Hampshire for sub-marginal land purchase and which would be turned over to the state for forest and recreational purposes. Each of these areas contains a nucleus of state forest reservations and the Forestry Department has for many years regarded the extension of them as desirable. Two new CCC camp applications have been filed for the period beginning April 1, 1935 for work on the Bear Brook and one other area in the event that these lands are acquired.

One other region has been under definite consideration by the Land Program, the Forest Service of the United States Department of Agriculture, which administers the National Forest, and our own State agencies. This involves an extension of the boundary of the White Mountain National Forest to the southward to include portions of certain towns in lower Grafton County.

Before taking further steps to extend the National Forest outside the original purchase area of the White Mountain region, where approval was granted by the Legislature in 1903, or acquiring sub-marginal and forest land in any of the areas which have been studied, the Federal authorities will expect the Legislature to pass appropriate legislation in the form of an enabling act approving the Federal program

or naming the conditions under which Federal purchases are acceptable to the State and agreeing to administer those which would be turned over to the State. Prompt action by the Legislature is most desirable. An opportunity exists not only to extend the benefits of the National Forest but also for the State to receive and administer in possibly several widely separated sections of southern New Hampshire sub-marginal and forest lands for recreational and other uses, to the benefit of those who sell their lands and to the locality and the State as a whole. Furthermore, improvement and development of these areas would be part of the program for work after April 1, 1935, by the present and prospective CCC camps and by other means. When it is realized that a policy of state acquisition of forests and reservations has been approved in our state for more than 25 years and that the Forestry Commission has been going forward with that policy by every reasonable means during all these years with very little funds for purchase, we should welcome the opportunity now presented by the Federal government to perhaps double the present acreage of State lands. A reasonable expansion of both national and state public lands which does not interfere with private needs and the extension of summer resident ownership of property is desirable and inevitable. A committee report of the State Planning Board on the subject of public acquisition of land has recently been prepared and is worthy of careful consideration.

There is a tendency for forest estates of some size, accumulated for sentimental reasons through years of effort by earlier owners to be offered to the state where the heirs feel the burden of taxes and yet are unwilling to sell the properties for what they will bring. Owners of forest property depleted through over cutting in an effort to find relief from taxes are usually not interested in holding their lands for future returns but are willing to sell to the Government or any purchaser at the local value of bare land. The problem of the general property tax as applied to standing timber has been a stumbling block to sustained yield management of private lands for many years. Until it is solved we cannot

expect private owners to be interested in conservative operating or long time ownership.

There should be an easy and methodical way to bring desirable tax delinquent land into state or town ownership for purposes of timber production, recreation or other public uses with the assurance of permanent title and a definite policy of management by the public. There are evidences that Congress will regard tax delinquency legislation by the States as highly essential and offer federal aid or benefits to those states which pass reasonable measures to this end.

Forest Resources and Markets

It is clearly one of the functions of the Forestry Department to aid the owners of forest property and the wood using industries alike in the proper use of our forest resources. For fire protection purposes the licensing of portable saw mills as well as approving and recording their locations and movements has long been one of its duties. Detailed records of the annual lumber cut in the State have been kept since 1925. It is of public value to know that the lumber cut from 1929 to 1932 declined from 220,665,000 to 62,255,000 B. F., that in the year 1933 increased to 90,202,000 and that records so far received for 1934 indicate an increase over 1933; also that 200 principal operators who cut the bulk of timber in 1929 decreased to 40 in 1932 and increased again to 60 in 1933.

New Hampshire has supplies of raw material, both hard and soft wood, available to the wood utilization plants and the lumber industry both in and outside the State. Woodland owners need and desire information about values, sizes and grades which the markets demand. They are generally unacquainted with the forest industries, where these are located and how they can supply these markets to the advantage of all concerned. Many active industries in need of raw materials or partly manufactured products are not well acquainted with the sources of supply. There are also idle plants, machinery and labor which need capital, incentive

and executive ability to bring about a restoration of former prosperity. There is special need for finding new uses for low grade white pine and hardwood dimension in the building trades by working with architects and builders and discovering other ways to use the raw materials we have.

At different times in the past, studies of permanent forest industries and markets for forest products have been made in co-operation with other agencies. A revised market study has been under way during the last two years, the records of which will be published separately from this report.

In June, 1933, the Fox Reservation in Hillsboro was put under administration as headquarters for forest research and demonstration in accordance with the Caroline A. Fox trust accepted by the Legislature of 1933. Dr. Henry I. Baldwin was appointed resident forester and director. Dr. Baldwin came to this work at a time when emergency employment was imminent and his service and the work to be done on the Fox Reservation helped greatly to carry the work program forward.

The purposes of the Fox Trust are not only to carry out at Hillsboro and elsewhere in the state research and demonstration in scientific forest management but to aid in bringing about improved methods of forest utilization. There is need for continued and long time study of forest resources and markets which will no doubt be accomplished by means of the Fox Trust in co-operation with the industries themselves and such other agencies as may be available.

Dutch Elm Disease

This fungus disease of the elm tree, which has been brought into this country and has gained an alarming foothold in three states adjacent to New York City, New York, New Jersey and Connecticut, within the past year or two, should not be overlooked. It has possibly serious consequences to New Hampshire as well as many other states which cherish the American elm for its ornamental value. The Forestry Department is working closely with the Experiment Station and the Extension Service of the State

University and with representatives of other New England states, the Federal Bureau of Entomology and Plant Quarantine, Arnold Arboretum of Harvard University and others who are familiar with and have the dangers of the spread of this disease clearly before them. Hundreds of trees known to be infected in the neighborhood of New York City are being taken out and destroyed this fall and winter by efforts in the respective states and by a special grant of Federal funds authorized by President Roosevelt. It is impossible to determine until another growing season how far the disease may have already spread to elms beyond the present known distribution of the disease. Scientists are of the opinion that rapid spread is due to a bark beetle which may carry the infection from tree to tree. Therefore spraying and the removal of dead and unhealthy limbs or trees will assist in the control. Though seriously infected trees are soon killed, it is impossible to identify the disease absolutely except by laboratory cultures. All specimens are therefore sent away for identification. The wilting of leaves on tips of branches and brownish discolorations in sapwood are suspicious symptoms. No specimen from New Hampshire has yet been found to contain the Dutch Elm disease. During the past season an effort was made to visit and secure samples of trees in New Hampshire which were reported as suspicious in appearance. A circular on the subject has just been issued by the Extension Service. Our course another season should be to cooperate with authorities and interested persons in towns adjacent to Massachusetts and the Connecticut Valley and to carry on scouting work and checking with local agencies in securing suspicious samples. The public should not be unduly alarmed but it is the duty of everyone to promptly report trees which appear to be infected. Our blister rust agents in the territory will aid in this work and the CCC camps may be used in the program. A small appropriation by the State is needed to take care of State overhead in connection with scouting work. If diseased trees are discovered an immediate problem of expense is involved in their removal and destruction.

Co-operation

There are many agencies in the Federal Government and the State, as well as among the towns and private organizations, whose interests and efforts are closely related to forestry, recreation and land use in their broader application to New Hampshire conservation. Almost no state department can be sufficiently self contained to cover its entire field of effort unaided. We, in the Forestry Department, have always endeavored to co-operate with as many public agencies and private organizations as possible which have common interests with our own for the betterment of the State. During the past two years many new official relationships have been established, particularly in the Federal Government, which have extended the field of co-operation temporarily at least and in ways greatly to the advantage of forestry and recreation in New Hampshire. We wish to acknowledge our appreciation of the financial aid and services received which have already made possible far more than could ever have been accomplished alone.

W. R. BROWN,
B. K. AYERS,
H. K. ROGERS,

Forestry Commission.

JOHN H. FOSTER, *State Forester.*

AMENDMENTS TO FOREST LAWS—1933

The Legislature of 1933 made the following changes in the forest laws:

Chapter 191 of the Public Laws:

Section 4-a was inserted after Section 4 to read as follows: 4-a. Duties. The state forester shall, under the supervision of the commission, execute all matters pertaining to the use of state forests and reservations including reservations for public recreational and park purposes.

Sections 24 and 25 were amended to read as follows: 24. Statement. The wardens shall render to the selectmen or the mayor or the proper city department, on blanks prepared by the state forester, a statement of said expenses as soon as possible after they are incurred, showing in detail the amount and character of the services performed, the exact duration thereof and all disbursements made by said wardens, and bearing the approval of the warden, and of the deputy warden if said expenses were incurred by his authority.

25. Duty of Warden. Upon receipt of said statement the selectmen of towns and mayors of cities if said bill is approved shall draw an order upon the treasurer for payment to the warden only of the amount of the bill as approved. Upon receipt of said payment the warden shall forthwith pay or cause to be paid to each person employed the amount of compensation due. The account of the warden shall be audited and included in the town report.

Chapter 192 of the Public Laws:

Section 1 was amended to read as follows: 1. Reservations. The forestry commission is hereby authorized to purchase with the consent of the governor and council suitable tracts of land for use for public reservations and to make provisions for the management of the same.

Section 1-a was inserted after Section 1 to read as follows: 1-a. Definition. The words "public reservation" and "state forest or reservation" as used in the laws relative to public forest lands shall be understood to include the use of such forests and reservations for public recreational and park purposes.

Section 3 was amended to read as follows: 3. Title; Use. On the payment of the value as finally determined, the title to the land so taken shall vest in the state and be forever held for the purpose of a public reservation and the tract shall at all times be open to the use of the public.

Section 5-c was inserted after Section 5-b to read as follows: 5-c. Authority. Any land purchased by the forestry commission for the purpose of a public reservation, any land which has been acquired by the commission in the name of the state by gift, escheat or otherwise for the purpose of a state forest or reservation and any land which may hereafter be so purchased or acquired may, in the discretion of the commission, be used for public recreational and park purposes, provided that such use is not contrary to the conditions incident to any bequest or gift.

Reference is made to other special forest laws enacted, as follows:

Chapter 49, Providing for the acceptance of a trust fund for forestry purposes, given by Caroline A. Fox.

Chapter 183, Providing for purchase by the State of a tract of land at White Lake in Tamworth for the purpose of a public recreational park.

Chapter 150, Section 7, Providing for emergency relief of unemployment in forestry work and appropriating \$100,000. each year for the two-year period ending June 30, 1935.

PUBLIC FORESTS



THE State of New Hampshire includes more than 758,000 acres of forest land in public ownership. This vast area is composed of about 700,000 acres of the White Mountain National Forest, 38,000 acres of state forests and reservations and almost 20,000 acres in town forests. This acreage is 12% of the total area of the State.

The first purchase by the Federal Government was in 1913 when several large tracts in the White Mountains were acquired. Since that time acquisition has been steady with greatly increased acreage during the past two years.



Crawford Notch from Mt. Willard.

The State received its first gift of forest land in 1891 and until the establishment of the Forestry Department in 1909 possessed only a few scattered tracts. During the next 15 years a small appropriation allowed the State to purchase needed areas for the practice and demonstration of forestry. The outstanding acquisition of scenic value was the purchase of Crawford Notch in 1913. During the years 1915 to 1930 the increase in State forest ownership was mainly through

gifts. Many valuable tracts were donated. The most important purchase was the taking of Franconia Notch by the State and the Society for the Protection of N. H. Forests. The New Deal has greatly stimulated the increase in acreage of forest land in public ownership. President Roosevelt's establishment of the Civilian Conservation Camps early in the spring of 1933 was the beginning of increasing this acreage and the means of improving these forest tracts. During the past two years over 4,000 acres of forest lands have been acquired either by direct purchase or by gift. The total of state forest acreage is 38,016 acres.

The towns were the earliest possessors of forest land. Some of these tracts were unallotted lands, others were gifts to the towns, some were tax delinquent lands and others were purchases by the town. The last biennial report stated that there were about 17,000 acres of forest land owned by towns. During the past two years there are indications that this acreage has materially increased probably to about 20,000 acres due to the inability of many owners of forest land to pay their taxes. It has been estimated that 3,000 acres have been added to town ownership. Considerable work has been done on town forests by C.C.C. camp crews, especially on boundary surveys.

White Mountain National Forest

M. A. MATTOON, *Forest Supervisor*

The administration of the White Mountain National Forest is entrusted to the Forest Service of the United States Department of Agriculture. This public forest represents a public expenditure in excess of \$6,000,000. Its local administration and protection is in the hands of the Forest Supervisor at Laconia, assisted by district Rangers at Gorham, Conway, Littleton and Plymouth. There are assistants on the Supervisor's staff specializing in forest management, recreation, acquisition and construction features.

The area of the forest is in round figures, about 700,000 acres. Of this approximately 40,000 acres lies in Oxford County, Maine, and the balance is in Carroll, Coos and Graf-

ton Counties, New Hampshire. Of the total area approximately 150,000 acres is not yet in actual Federal ownership but is under contract of purchase pending clearing of title. Additional purchases within the existing boundaries are being made as rapidly as price agreements are reached between owners and the Government.

With the close and hearty co-operation of the State Forester and his organization, the White Mountain National Forest continues to enjoy good fortune in the number and severity of forest fires. Acknowledgment is made with gratitude for the State Forester's help in securing closure of



The headwaters of many of New England's principal rivers are situated in the White Mountain National Forest.

woodlands during periods of high fire hazard and the splendid co-operation of state and town fire organizations within the White Mountain National Forest territory in carrying on the work of public education in fire prevention. The Governor's ban upon public use of the woodlands of the state during an extremely hazardous period in May, 1934, was forcefully applied by state and National officers and proved helpful in bringing to the attention of many users of woodlands the necessity for extreme care with fire and the values at stake. The National Forest organization is glad to report that during the calendar year 1933 less than 2 acres of National

Forest land was burned over and that up to November 15 less than 2 acres burned in 1934.

The underlying policy of the Administration of the National Forest is conservation through wise use of those natural resources existing within its boundaries for the greatest net public benefit. It is a prime purpose to produce maximum successive crops of timber products on a sustained basis and to harvest such crops for the uses of local industries. The fulfillment of such an objective requires that such crop production be confined to those areas which by nature are best adapted to timber growing and wherein the harvesting of them will not unduly interfere with a more dominating use of these areas. Scenic and aesthetic values must be considered, the use of areas for domestic water supply or for recreation have to be weighed. Large areas are now set aside as protection forest in which no cutting will be done. Logging areas are delineated well back and are effectively screened from roads and important foot trails and from the banks of streams heavily frequented by campers, fishermen, hunters and other recreation users.

Since the publication of the last biennial report of the Forestry Commission of the State of New Hampshire, a change in the administration at Washington has taken place. Very shortly after his inauguration, President Roosevelt identified the National Forests as a field for productive action looking toward the relief of unemployment and human distress. The National Recovery Administration made funds available for improvement work. The Civilian Conservation Corps was organized. As a result of these activities many local people have been put to work, large local expenditures for supplies and equipment have been made and the improvement program of the National Forests have been speeded up at least 10 years. The White Mountain National Forest and the local people have shared in this direct relief activity. During the fiscal year 1934 upwards of \$750,000 has been disbursed for labor and supplies on the White Mountain National Forest exclusive of the salaries of Army officers and wages of enrollees in the Civilian Conservation Corps. Under

NRA funds, using almost exclusively local labor, the road program, the timber survey and stand improvement program was carried forward and much was done in the installation of added recreation facilities at the Camp Grounds. Using Emergency Conservation funds there have been established nine C. C. C. camps on the White Mountain National Forest of which seven are in New Hampshire and two in Maine. The latter are close to the State line and a goodly portion of their activities are in New Hampshire. The enrollees in these camps are exclusively from New England with a good pro-



Rebuilding of old roads, or the construction of new have made National Forests more accessible to the public and assisted in fire suppression.

portion of New Hampshire boys in the outfits. Local experienced men and much of the foremanship and skilled workers are employed from local sources. The Corps is engaged upon a great variety of work and much has been completed since its inauguration in April, 1933. Badly needed new roads have been built, cultural work in the woods improving the quality of timber stands is under way, new trails have been constructed, the impounding of attractive bodies of water for recreation and fish cultural purposes has been started, the improvement of fishing streams has been undertaken, the reduction of special fire hazards has been attacked, the telephone system overhauled and radio communi-

cation installed and many other tasks of maintenance or minor construction have been successfully undertaken and carried out. To submit a list in detail of the amount of work done and its nature would perhaps be beyond the scope of this brief statement but suffice it to say that the improvement work done during the past biennium is going a long way toward placing the physical plant of the White Mountain National Forest in shape for intensive protection and management for the benefit of the people of New Hampshire and the country at large.

White Mountain National Forest guards the headwaters of several important New England rivers. The sources of the Saco and Merrimac Rivers and those of the most important tributaries of the Androscoggin and Connecticut rivers lie within the forested boundaries of this Federal area. That they are protected from damage by fire or unwise exploitation is noteworthy because of their vital relationship to the industrial and domestic life of New England. Protection of these streams against excessive irregular flow and against heavy silting of channels through the maintenance of an adequate forest cover and the construction of some water storage facilities is definitely at hand.

The White Mountain Area together with the adjoining lake section of New Hampshire is being visited and enjoyed by steadily increasing numbers. Over two million visitors spend all or a part of their summer vacation time here. The growing popularity of winter sports is beginning to make itself felt in the communities of the White Mountain area. With the excellent work done by the State Highway Department in keeping the highways open through the winter months and through special facilities provided by the railroads more and more people are coming to the White Mountains in the winter for skiing and other winter sports. The opening of a considerable mileage of high class ski trails in the National Forest but tributary to the communities adjacent to it has been helpful toward building a paying winter business for the many hostelries heretofore enjoying only a short summer trade. The many ski and outing clubs of the

section have co-operated splendidly in guiding the policy and plans for construction of ski trails and other facilities for winter out-of-doors recreation.

Very material improvement to existing camp grounds and the opening of needed new ones has been undertaken during the past two years. The public is making use of these areas in mounting numbers. Facilities in the way of added trails and trail shelters are being provided for the hiker and recreationist who prefers more seclusion and remoteness than is available on the improved picnic and camping areas.



The use of the National Forest for recreational purposes, both summer and winter, is ever increasing.

With the increasing use of the National Forest for recreation purposes many difficult and often complicated administrative problems arise which involve important decisions as to the wisest and best use of certain areas. Specialists in recreation planning and landscape work are now assigned to the staff and have undertaken a close study of the existing facilities for recreation both natural and man made, developed or undeveloped with the purpose of working out a master recreation plan for the Forest looking far into the future and assuring careful weighing of the values involved and the benefits to be received. Such a plan shall assure careful and natural development of suitable areas for the different classes

of recreational use, not forgetting the necessity for solitude and wilderness. It will assure the installation of structures that are in keeping with the natural setting and the protection of the aesthetic values. Detailed information as to any phases of administration of the White Mountain National Forest and the services which it renders will be gladly furnished by the Forest Supervisor at Laconia or the District Rangers at Conway, Gorham, Littleton and Plymouth.

ACQUISITION OF STATE FORESTS 1933-34

In the biennial report of the Forestry Commission for the fiscal years ending June 30, 1932 is a brief summary of the unemployment relief undertaken during the fall months of 1932. A fund of \$18,000 was used mostly on State reservations for general improvement work. A total of 831 men from 50 cities and towns were employed. Relief agencies in towns received over 700 cords of wood cut on the various work projects. A summary of unemployment work done at that time was also made.

Description of reservations and tracts acquired by State during 1933 and 1934.

Belknap Mountain Addition

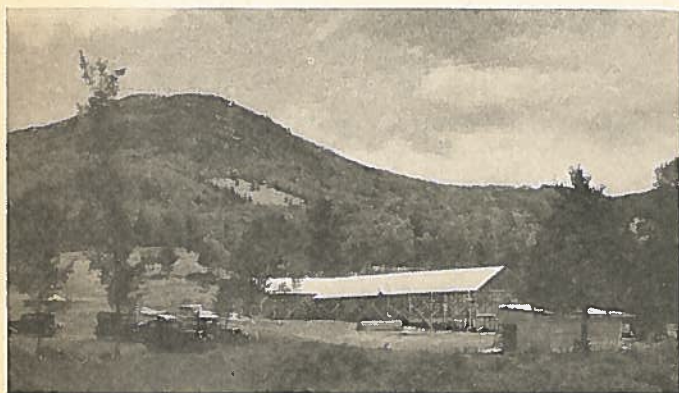
In order to obtain an entrance to the Mt. Belknap property a right of way and a parking place of 3 acres was purchased from L. Murray Weeks of Gilford for \$250. This entrance begins just north of the old Morrill property now the residence of Mr. Weeks, crosses the open field back of his house and joins the state tract at an old gateway. From this point a new road recently built for cars continues up the mountain slope with easy grades to the large open pasture.

Black Mountain

During the early part of the spring of 1934 the Transient Bureau of the Federal Government with local offices in Concord, N. H., requested several possible locations on State lands for a permanent camp. After careful examination of certain areas, a site for this camp was finally determined

near the old Lime Kiln on the Black Mountain State Forest of 400 acres in Haverhill, N. H. In order to provide work for this camp which takes care of 200 men, the purchase of additional forest land was considered necessary. Owners of adjacent lots signed options and a fund of \$2,750 was set aside to acquire about 240 additional acres of forest land. The following persons conveyed tracts of forest land to the State:

Mr. George Clark	Lisbon, N. H.	40 acres
Mrs. Cora Chute	Lowell, Mass.	80 "
Mrs. Lilla French	Haverhill, N. H.	90 "
Mrs. Cora Marden	Haverhill, N. H.	30 "
Total		240



Black Mt. and Construction of Federal Transient Camp.

These lots have all been surveyed and mapped and add greatly to the value of the Black Mountain tract. The Camp consisting of seven buildings has been completely and adequately equipped. Crews are already in the woods on the State Forest carrying on forest improvement work.

Cardigan Camp Site

Several camp sites were examined by Army officers for the CCC Camp in Grafton County during May, 1933. The

most desirable one was finally located on private land in Danbury, N. H., on the farm owned by Mrs. Ada C. Kramer of Colchester, Connecticut. A one-year lease was made by the State. At the termination of this lease it became apparent that the CCC Camps would undoubtedly continue for at least another year. Negotiations were commenced to purchase the leased area and additional land for a new entrance from Mrs. Kramer. In order to carry out this plan a right of way had to be obtained from the Town of Danbury. This permission was obtained at a special town meeting held September 12, 1934. Final boundary lines were at last determined and 17 acres were purchased at a price of \$750. The camp site is within one-half mile of Danbury village and the Boston and Maine Railroad and is ideally situated for carrying on forestry projects on Cardigan Mountain, Kearsarge Mountain and Wellington reservations.

Endicott Rock

The City of Laconia, through Mayor Carroll and its City Council, deeded to the State as a gift about two acres of open land at the Weirs, N. H., and known as Endicott Rock. For many years the public have been using the open land for a picnic place and for the parking of cars. A small bathing beach has also been an attraction. The State already owns the foot bridge and platform at the Rock. During the summer season a caretaker and life guard was employed to supervise the great throng of people who frequented this place. Extensive improvements are being planned to care for the public.

Forest Lake

Forest Lake is situated in the towns of Dalton and Whitefield and is made up of 73 acres along Forest Lake and 347 of woodland and pasture with a rise of 900 feet in elevation. The land was purchased by the Governor and Council. Through funds provided by the federal civil work administration a central bath house with water toilets, septic tank, and a parking area was built. In addition, six ski runs were

laid out, two Adirondack camps with dirt toilets. Cooking facilities, in connection with the camps, have also been provided. The work was not completed before the close of the season and no record of attendance was kept. The construction mentioned above was not carried on by the Forestry Department.

Honey Brook Addition

In order to facilitate the building of a road towards the interior of the Honey Brook tract Mr. Irving E. Barnes of Marlow, N. H., deeded to the State 8 acres of open land adjoining his farm. This addition permits a road to be built with easy grades to the old county road and on to the Gumb farm. The taking over of this small tract also straightens some of the State boundaries which heretofore were not definitely established.

Huckins

Mr. S. O. Huckins of Ossipee was always interested in all forestry activities. In 1914 he deeded to the State 100 acres in Ossipee to be used for experimental purposes in forest planting. In order to establish a breeding place for fish Mr. Huckins decided to deed to the State a very large tract of land in Freedom, N. H. It extends from an inlet on the easterly shore of Ossipee Lake to the Freedom-Madison town line a distance of several miles. In Black Brook rearing pools can be made for brook trout and bass; from which to stock the mountain streams nearby. The whole tract which Mr. Huckins expected to deed to the State amounted to 1,458 acres. Mr. Huckins died before he could complete the final arrangements with the Fish and Game and the Forestry Departments. His two sons, Albert and Ernest Huckins, signed the deed as officers of the Ossipee Valley Land Corporation in May, 1934. The Governor and Council have given the supervision of this tract to the Forestry Department with special rights to the Fish and Game Department.

Due to the fact that the late S. O. Huckins of Ossipee has given two tracts of forest land to the state, the original gift is now to be known as Duncan Lake.

Kingston Lake

Kingston Lake is adjacent to the village of Kingston where the state purchased 44 acres with nearly half a mile of lake shore. Here a beautiful park has been laid out with parking space for 200 cars, graded shore, central bath house, septic tank for water toilets, water supply and disposal system,



Bathing Beach at Kingston Lake.

lean-to shelter, chemical toilets, roadways and paths. The beach has been used throughout the season but the bath house and toilets were not completed for use this season. The Forestry Department was given administration of property early in the season and employed a life guard and provided temporary canvas shelters for changing clothes. The Forestry Department this fall has constructed a cabin and a garage for the caretaker's use another season. Of the many visitors 27,393 registered.

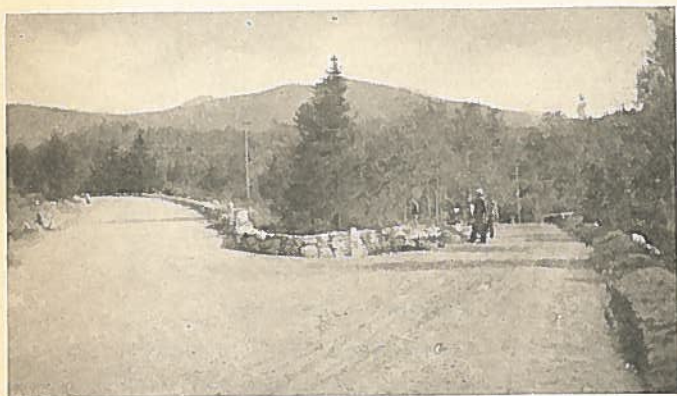
Milan Hill

The State, in 1932, leased the top of Milan Hill in Milan, N. H., from the Brown Company for the purpose of building and maintaining a looking station. That same year a 40-foot steel tower, cabin and a telephone line were built and put into operation. The location of this station appeared so desirable for reporting fires because of its commanding view

and so accessible from Milan Village, that the State made negotiations for purchase. An offer of \$1,000 for the property was accepted by the Brown Company. This property consists of a lot of 122 acres or more, open fields, scattered woods and a stone cottage located on the southern part of the lot. The CCC Camp in Gorham is in a position to make improvements on this property as it is located within a short distance. This station, during the last two years, has reported more fires than any of the other lookout stations in Coos county.

Moose Brook Park

During the winter of 1933 and 1934 the Federal Government requested the Forestry Department to suggest possible additional sites suitable for work projects for CCC Camps. After careful study a site was found in Gorham, N. H., to



Completed Road, Moose Brook State Park.

meet the requirements of the Federal Department of the Interior for a State Park Camp. Options were obtained on parts of several farms including buildings and camps together with woodlots and open fields. These areas were admirably suited for the proposed camp. During the spring and summer of 1934 a total of 755 acres of land were purchased

from many owners for \$9,525.24. The main branch of Moose Brook passes through some of these lots and makes possible the desirable recreational features of this park. One of the finest views of the Presidential Range can be obtained from this location. The following persons sold land to the State: William J. Perkins, Gorham; Moses C. Berry, Gorham; Nettie C. Berry, Gorham; Charles H. MacPherson, Gorham; Elizabeth M. Ridlon, Goffstown; Wilbur K. Doran, Manchester; Henry C. Carberry, Gorham; James E. Hinchey, West Stewartstown, and the Brown Company, Berlin, N. H. At the present time the area purchased by the State appears sufficient to meet all needs for recreational uses.

Pawtuckaway Addition

In order to make the Pawtuckaway Reservation more accessible and to provide additional work projects for the CCC Camp located nearby it was deemed advisable to purchase a tract of 153 acres of forest land and open field for \$750 from Mr. Isaac Randall of Hampstead, N. H. This tract in Deerfield and Northwood lies on both sides of the main road to the "Boulders" and includes excellent gravel, valuable young pine growth and fuel wood. Mr. Randall formerly owned much of the growth on the Pawtuckaway tract before the State obtained control and sold portions of this woodland to be included in the Reservation.

Pillsbury Camp Site

Mrs. Inez Bowlby of Goshen, N. H., deeded to the State during July, 1934, a tract of 18 acres upon which is located the Pillsbury CCC Camp. This attractive camp site was purchased for \$300. Prior to its purchase this tract was leased for use by the Camp. From this site work projects are carried on by the CCC men on the Dodge Brook, Honey Brook and Pillsbury tracts.

Powow River

The people of South Hampton unanimously voted on town meeting day in March 1933 to deed a 52 acre tract of

forest land to the State. The lot lying to the west of the village and located between two roads included a ball field and several acres of woodland which badly needed improving. The Selectmen realized that the town lacked funds to carry on necessary work and suggested the transfer to the State. Since its acquisition the needed improvements have been made by CWA funds providing both work and wood to needy townspeople.

Pulpit Rock

A tract of 224 acres of woodland located in the westerly part of Bedford was deeded to the State as a gift by Mr. Harold J. Campbell of Manchester. Near the center of this tract is a rocky gorge through which flows a small brook. There are pretty water falls, pot holes, boulders scattered about and one formation of rocks known as Pulpit Rock. The wood and timber on this tract is reserved by Mr. Campbell until 1940. It is expected that after improvements have been made, this tract will be visited by many tourists because of its scenic features and its accessibility. In order to locate a more attractive entrance to this tract, a lot of land 28 acres in extent lying between Mr. Campbell's land and the main highway was purchased from Mr. Napoleon Lapointe for \$175. This addition allows a road of easy grade to be constructed direct to Pulpit Rock.

Ragged Mountain

Mrs. Josephine C. Hamp of Andover, New Hampshire deeded a tract of 76 acres of land to the State in March 1934. This tract has many possibilities for recreational use as there are open fields, groves of pine woods and the possibility of restoring an old dam that was washed out in the 1927 flood. The replacing of this dam would flood about 15 acres and greatly enhance the beauty of the place. Adjacent property owners have agreed not to commercialize their lands provided the State improves the property.

Rock Rimmon

In 1928 the State obtained a lease from Thomas M. and Thomas H. Arnold, father and son, of Haverhill, Massachusetts, for the purpose of erecting a lookout tower, cabin and telephone line on Rock Rimmon Hill in the town of Kingston. A right of way from a town road gave access to the station. A little later this tower and cabin were built and a telephone line constructed. These have been maintained by the State since that time. Recently Mr. Thomas M. Arnold died and his son agreed to sell to the State all of his forest lands on Rock Rimmon in the town of Kingston. These lots were surveyed and found to contain 47 acres including second growth stands of pine and hardwoods. The amount of consideration agreed upon was \$470 for the whole tract. The purchase of this tract is most desirable to protect the State's property. The State is also interested in acquiring this land for the reason that last year Kingston Pond, a valuable recreational area, a mile away, was taken over by the Forestry Department and is being developed. These two tracts can be combined for public use and for fire protection and should be worked in conjunction.

Strawberry Hill

A tract of 60 acres was given to the State by Mrs. Laura C. Allee of Ridgefield, Connecticut, in memory of her husband the late Dr. William H. Allee. The Society for the Protection of New Hampshire Forests assisted in this transfer of title. The lot lies on the northerly slope of Strawberry Hill, Bethlehem and fronts Berkley Street and the road leading to Franconia Village. The forest is composed of excellent stands of spruce and hardwoods which have not been cut for many years. The town of Bethlehem own a reservoir within this tract and a right of way to it which includes about 2 acres. Reasonable building site restrictions have been included in the conveyance.

Wadleigh Park

Wadleigh Park on Kezar Lake in Sutton includes 52 acres of woodland with 1,800 feet of beach. It was held in trust by the Village Improvement Society, the town of Sutton and the Society for Protection of New Hampshire Forests and by them has been released to state control. There



Lake Kezar's pine-clad shores and clear, sparkling waters have proved an attraction to thousands.

was a 48 stall bath house and rest house on the premises. A CWA project graded the ball field and erected bleachers, rebuilt the rest house for water toilets, built one new bath house, central shelter, two chemical toilets, new road through property and improved the woodlands. The park was in general use during the past season and is one of the most attractive recreational areas of the state. The Forestry Department maintained a lifeguard and registered 20,804 visitors.

Waldron

In 1930 Mr. William K. Stockdale of Northwood gave to the State 66 acres of farm and woodland in Manchester and Hooksett. After his death in April, 1933, the will provided that the State should have his one remaining shore lot located between the road and the shore of Bow Lake in Northwood. This one acre lot offers possibilities for a pub-

lic parking place and picnic grounds. The tract is named in memory of Mr. Stockdale's wife, Mary E. Waldron. It is expected that improvements will be made to develop and enlarge this tract.

White Lake

In 1931 the Forestry Department obtained a lease from Mr. Frank Lord of Ossipee of several acres of land on the southern shore of White Lake, Tamworth. At this point on



*Fire place and rubbish receptacle, White Lake
Reservation, Tamworth*

White Lake is located one of the finest and most desirable bathing beaches in that section. For years people who knew of this lake often frequented it during the summer months and took delight in camping and picnicking on its shores. Under lease with the State, a caretaker was hired and small bath houses and ranger stations were built. Negotiations were begun with Mr. Lord for the purchase of a tract of forest land extending from the main highway leading to the White Mountains to a point west of White Lake and including about one-half a mile of shore frontage. An act was introduced at the 1932-33 session of the legislature for funds to accomplish this purpose and \$6,500 were authorized. The following summer this tract of 258 acres was surveyed and marked. The tract purchased from Mr. Lord includes suf-

ficient area for an excellent camping ground with parking place adjacent, entrance drives to the property from both highways and adequate areas for developing the property for many years hence. Increased attendance during the past two seasons give proof of the wisdom of acquiring this tract for forestry and recreational purposes.

Governor Wentworth

Governor John Wentworth was the last provincial governor of New Hampshire taking office in 1768 and forced to flee the country in 1775. While living in Portsmouth, the seat of the government, he built a road to Wolfeboro and there established a summer home on a large estate on the westerly shore of Wentworth Lake, then known as Smith Pond. His estate was undoubtedly the most pretentious and extensive of its kind during that period. Here he constructed a fine large house, stable and other buildings for his establishment. From here Governor Wentworth made



State Reservation Life-guard headquarters and first-aid supplies.

his famous trip in 1772 to the Commencement of Dartmouth College. After the Revolutionary War the big house and its furnishings were auctioned and several families established their residence there until 1820 when the huge house caught fire and burned to the ground. The other buildings fell in ruins

or were torn down. The estate was divided and passed through many ownerships. The last owner was Professor Laurence S. Mayo of Cambridge, Massachusetts, who felt that a part of this historic place should be in State ownership. In December 1933 Professor Mayo deeded as a gift to the State a tract of 98 acres including the site of the old mansion and the Governor's Landing on Wentworth Lake. It is expected that general improvements to the grounds will be made and a museum and caretaker's house built by the State.

Wentworth Beach

The town of Wolfeboro deeded about six acres of low land on the shore of Wentworth Lake, Wolfeboro, on the road to Sanbornville and Stephen W. Clow donated about ten acres on the opposite side of the road to the state. A CWA project provided a 15,000 cubic foot fill for parking and a bath house, water toilets, septic tank, pumping to a disposal field, and water supply. Work yet to be done is to complete the fill and grade the surface. There is an excellent bathing beach 1,800 feet in length. Although the building was not completed until the close of the season, the register book was signed by 8,831 persons. The Forestry Department maintained a life guard during the past season.

Woodman

Mrs. Carrie A. Robertson of North Conway requested the Forestry Department during the winter of 1933 to examine her father's farm, the old James K. Woodman farm, located in Deerfield and Northwood and determine its possibilities for a State Forest tract. Although the area had recently been stripped of its forest resources, the proximity to the Pawtuckaway CCC Camp suggested many interesting work projects. Mrs. Robertson was informed that the old farm could be used and maintained as a State Forest. Later it was deeded in April, 1933. After carefully surveying the tract the area was found to be 141 acres; 88 acres in Deerfield and 53 in Northwood. The house a century and a

half old was destroyed by fire several years ago and the barn later removed. The main road between Deerfield and Northwood passes through this tract. The heirs of James K. Woodman signing the deed were Mrs. Carrie A. Robertson of North Conway, recently deceased; Mrs. Nellie L. Locke of Northwood; Mrs. Emma J. LaBell of Sandown and Charles W. Woodman, Arlington, Mass.

The total acreage of state forests and reservations as given in the last biennial report was 33,148 acres. Acquisitions during the past two years were 4,293 acres, thus giving an apparent total of 37,441 acres. However, recent surveys on many of the larger tracts increased the total by 575 acres. The total acreage of state lands is now 38,016.

The following tabulation gives the acreage of state lands by towns.

ACQUISITION OF STATE FORESTS AND RESERVATIONS

A table listing the reservations and tracts acquired by the State from March 1, 1933 to December 31, 1934.

<i>Name</i>	<i>Location</i>	<i>Acreage</i>	<i>Year</i>	<i>Gift</i>	<i>Cost</i>
Strawberry Hill	Bethlehem	60	March 1933	Gift	
Powow River	South Hampton	52	March 1933	Gift	
Woodman	Northwood and Deerfield	141	April 1933	Gift	
Waldron	Northwood	1	May 1933	Gift	
White Lake	Tamworth	258	September 1933		\$6,500.00
Forest Lake	Dalton	420	November 1933		3,000.00
Governor Wentworth	Wolfeboro	98	December 1933	Gift	
Kingston Lake	Kingston	44	December 1933		3,500.00
Wentworth Beach	Wolfeboro	16	January 1934	Gift	
Pulpit Rock	Bedford	252	March 1934	Gift &	175.00
Ragged Mountain	Andover	76	March 1934	Gift	
Moose Brook	Gorham	755	April 1934		9,525.94
Endicott Rock	Laconia	2	May 1934	Gift	
Huckins	Freedom	1,458	May 1934	Gift	
Pillsbury Camp	Goshen	18	July 1934		300.00
Black Mt. Addition	Haverhill	240	July 1934		2,750.00
Belknap Mt. Addition	Gilford	3	August 1934		250.00
Pawtuckaway Addition	Deerfield and Nottingham	153	September 1934		750.00
Honey Brook Addition	Marlow	8	October 1934	Gift	
Rock Rimmon	Kingston	47	November 1934		470.00
Cardigan Camp	Danbury	17	November 1934		750.00
Milan Hill	Milan	122	December 1934		1,000.00
Wadleigh Park	Sutton	52	December 1934	Gift &	110.00
		4293	Acres		\$29,080.94

Average cost per acre—\$6.77.

REPORT OF FORESTRY COMMISSION

STATE FORESTS AND RESERVATIONS BY TOWNS

<i>Town</i>	<i>State Land Total Acres in Town</i>	<i>Name of Tract in Town</i>	<i>Divisions of State Tracts in Towns</i>	<i>Total Acres in Tract</i>
Acworth	178	Honey Brook	Acworth 178 Lempster 53 Marlow 590	821
Alexandria	1089	Cardigan Mountain	Alexandria 866 Orange 2443	3,309
Allenstown	413	Welton Falls	Alexandria 223	223
Alton	214	Bear Brook	Allenstown 413	413
Amherst	81	Alton Bay	Alton 214	214
		Hodgman	Amherst 18	18
		Ponemah	Amherst 63	63
Andover	319	Kearsarge Mountain	Andover 243 Wilmot 615	858
		Ragged Mountain	Andover 76	76
Ashland	44	Scribner-Fellows	Ashland 44 New Hampton 96	140
Bartlett	658	Merriman	Bartlett 530	530
		Cathedral & White	Bartlett 128	154
		Horse Ledge	Conway 26	
Bedford	252	Pulpit	Bedford 252	252
Bethlehem	60	Strawberry Hill	Bethlehem 60	60
Boscawen	293	State Forest Nursery	Boscawen 142 Salisbury 115	257
		Merrimack River	Boscawen 151	151
Bristol	154	Sugar Hill	Bristol 57	57
		Wellington	Bristol 97	97
Campton	246	Livermore Falls	Campton 134	134
		Blair	Campton 112	112
Canaan	174	Mascoma	Canaan 174	174
Charlestown	905	Hubbard Hill	Charlestown 680	680
		Connecticut River	Charlestown 225	225
Concord	120	Taylor	Concord 7	7
		Walker	Concord 47	47
		Allen	Concord 25	25
		Mast Yard	Concord 41	400
			Hopkinton 359	
Conway	999	Conway Common		
		Land	Conway 930	930
		Redstone	Conway 43	43
		Cathedral & White	Conway 26	154
		Horse Ledge	Bartlett 128	
Dalton	420	Forest Lake	Dalton 420	420
Danbury	17	Cardigan Camp	Danbury 17	17
Deerfield	209	Woodman	Northwood 53 Deerfield 88	141
		Pawtuckaway	Deerfield 121	121
Dublin	80	Leighton	Dublin 80	80
Dunbarton	56	Everett	Dunbarton 56	56
Effingham	15	Green Mountain	Effingham 15	15
Farmington	99	Blue Job	Farmington 99	99
Fitzwilliam	8	Grant	Fitzwilliam 8	8
Franconia	2817	Franconia Notch	Franconia 2,817 Lincoln 2,427	5,244

<i>Town</i>	<i>State Land Total Acres in Town</i>	<i>Name of Tract in Town</i>	<i>Divisions of State Tracts in Towns</i>	<i>Total Acres in Tract</i>
Freedom	1458	Huckins	Freedom	1,458
Gilford	559	Belknap Mountain	Gilford	559
Gilmanton	42	Meadow Pond	Gilmanton	42
Gilsum	98	Pot Holes & Bear Den	Gilsum	98
Goshen	436	Pillsbury	Goshen	418
			Washington	2,667
		Pillsbury Camp	Goshen	18
Gorham	755	Moose Brook Park	Gorham	755
Greenville	4	Russell	Greenville	4
			Mason	21
Groton	546	Province Road	Groton	546
Hart's Location	5925	Crawford Notch	Hart's Location	5,925
Haverhill	640	Black Mountain	Haverhill	640
Henniker	46	Ames	Henniker	15
		Craney Hill	Henniker	31
Hillsboro	363	Fox	Hillsboro	363
Hopkinton	389	Mast Yard	Hopkinton	359
			Concord	41
		Contoocook	Hopkinton	30
Hooksett	8	Stockdale	Hooksett	8
			Manchester	58
Jaffrey	886	Monadnock	Jaffrey	493
		Haven	Jaffrey	95
		Poole	Jaffrey	166
		Sawyer	Jaffrey	80
		Gay	Jaffrey	52
Keene	21	Beech Hill	Keene	21
Kingston	91	Kingston Lake	Kingston	44
		Rock Rimmon	Kingston	47
Laconia	2	Endicott Rock	Laconia	2
Lempster	268	Dodge Brook	Lempster	215
		Honey Brook	Lempster	53
Lincoln	2427	Franconia Notch	Lincoln	2,427
			Franconia	2,817
Litchfield	122	Litchfield	Litchfield	122
Livermore	25	Arethusa Falls	Livermore	25
Loudon	50	Soucook	Loudon	50
Manchester	58	Stockdale	Manchester	58
			Hooksett	8
Marlow	590	Honey Brook	Marlow	590
			Lempster	53
			Acworth	178
Mason	46	Russell	Mason	21
			Greenville	4
		Kimball	Mason	25
Milan	122	Milan Hill	Milan	122
New Hampton	96	Scribner-Fellows	New Hampton	96
			Ashland	44
New Ipswich	101	Marshall	New Ipswich	20
		Binney Pond	New Ipswich	81

<i>Town</i>	<i>State Land Total Acres in Town</i>	<i>Name of Tract in Town</i>	<i>Divisions of State Tracts in Towns</i>	<i>Total Acres in Tract</i>
Northwood	54	Waldron Woodman	Northwood	1
			Northwood	53
			Deerfield	88
Nottingham	970	Stevens Nottingham Pawtuckaway	Nottingham	4
			Nottingham	16
			Nottingham	950
			Deerfield	121
Orange	2443	Cardigan Mountain	Orange	2,443
Ossipee	112	Duncan Lake Lord	Alexandria	866
			Ossipee	100
			Ossipee	12
Pelham	63	Jeremy Hill	Pelham	63
Pembroke	7	Glover	Pembroke	7
Peterboro	248	Casalis Miller Park	Peterboro	245
			Peterboro	3
Piermont	143	Sentinel Mountain	Piermont	143
Rindge	902	Annett	Rindge	902
			Sharon	190
Rochester	20	Salmon Falls	Rochester	20
Rumney	5	Baker	Rumney	5
Salisbury	115	State Forest Nursery	Salisbury	115
			Boscawen	142
Sharon	190	Annett	Sharon	190
			Rindge	902
South Hampton	52	Powow River	South Hampton	52
Stoddard	76	North Branch Pitcher Mountain	Stoddard	71
			Stoddard	5
Sutton	52	Wadleigh Park	Sutton	52
Tamworth	2303	Hemenway Bowditch-Runnells White Lake	Tamworth	1,991
			Tamworth	54
			Tamworth	258
Warner	462	Harriman-Chandler Davisville Carroll	Warner	405
			Warner	32
			Warner	25
Washington	2667	Pillsbury	Washington	2,667
			Goshen	418
Weare	309	Clough	Weare	309
Wilmot	615	Kearsarge	Wilmot	615
			Andover	243
Wolfeboro	114	Governor Wentworth Farm Wentworth Beach	Wolfeboro	98
			Wolfeboro	16
			Wolfeboro	16
Total	38,016			

WORK PROJECTS AND EXPENDITURES UNDER CHAPTER 150, LAWS OF 1933



THIS act providing for emergency relief of unemployment by highway, forestry and general improvement work became effective June 8, 1933. Section 7 provided that the sum of \$100,000 be made available each year to be expended by the Forestry Department under the direction of the Governor and Council for the relief of unemployed and needy citizens of our towns and cities by furnishing work of benefit to the public on the State and municipal forest and reservations and such work on private lands as relates to the control of forest insects and tree diseases and the prevention and control of forest fires, including the supervision, transportation, tools and materials necessary for the proper conduct of the work.

In carrying on these projects an effort was made to keep as large a part of the expenditures in daily wages as possible, however, in developing some features where the public would receive further direct benefit, it was necessary to spend sizeable amounts for material and trucking. These costs are noticeable where dams, bridges, roads and buildings were a part of the project. One exception to these was where it was necessary to use teams or trucks to dispose of brush that would be a fire hazard.

In the following paragraphs brief summaries of the work show what was done under each project, while the table at the end shows the distribution of costs and the total amount spent on each project.

Allen Tract, Concord

Twenty acres of this cut-over lot of 25 acres, planted to white and scotch pine were improved as a CWA project which terminated March 1, 1934.

Improvement work was resumed on April 6 as a Department "Forest Work Project" and discontinued May 5, 1934. Plantations on the remainder of the tract were released from

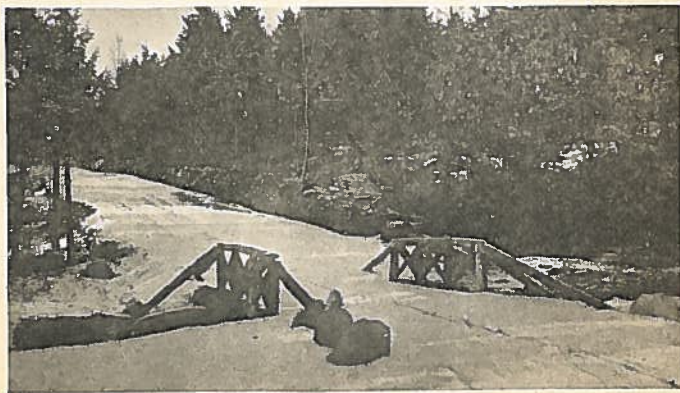
overtopping birch; lower branches pruned and weevil damage corrected. In addition, an area of $\frac{3}{4}$ of an acre of 25 year old pine was improved by release cutting, pruning and thinning. All brush was burned in anticipation of re-planting sections of the tract where pine had "failed."

On the afternoon of April 19, a forest fire, started presumably by Mayflower pickers, broke out along a power line paralleling the South line of the lot and burned over approximately two-thirds of the lot destroying some of the best of the planting. The fire increased the size of the area to be planted and 21,000 Norway and Scotch pine were required to reforest it. No further improvement work is necessary for the present.

A crew of 18 men and 1 foreman, using 14 men from Concord and Boscawen, were furnished 208 man days work. Thirty-six cords of wood were turned over to the county relief organization.

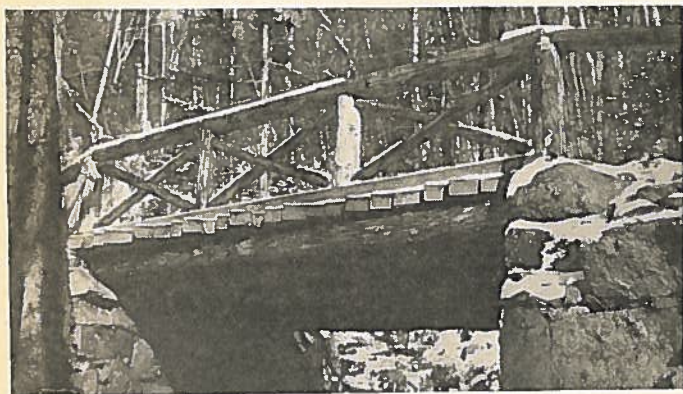
Mt. Belknap Auto Road

During the summer of 1934 it was decided to construct an auto road from the old Morrill farm in Gilford to the large open pasture on the westerly slopes of Belknap Mt. Work began on this project July 15 with a large part of the labor hired from Laconia and using State unemployment funds.



Lower bridge and grade of the new Belknap Mountain Road.

The road construction commenced at the old gate-way which is the west boundary of Mt. Belknap reservation. Three switch-backs were built in this road to maintain easy grades up the slopes of the mountain. A parking place has been made at the old pasture half way to the summit sufficient to accommodate 50 cars. A picnic ground nearby with



An example of bridge construction on new Belknap Mt. road.

fireplaces is being planned. From this point the trail leads to the lookout tower and watchman cabin at the summit only three-quarters of a mile away. On September 23 the project as carried on by the use of State funds terminated and men from the CCC side camp at Laconia will continue the work until completion. The total length of this road is 1.5 miles.

Black Mountain, Haverhill

While a relief project was undertaken on this tract with CWA funds, commencing on April 6, 1934, and continuing until May 12th, a crew of ten men and foreman carried on the project under the State Emergency Relief program. A considerable amount of forest improvement was carried on, brush being cleared up and burned. Four hundred and five fence posts and $13\frac{1}{2}$ cords of fuel wood were salvaged from

these operations. An area for use of the Federal Transient Bureau Camp was fenced in, a total of about 3,712 feet of fencing with four strands of wire being constructed.

Blair Tract, Campton

Work started here April 8th, following CWA and relief projects doing forest improvement work. Ten men and a foreman continued making thinnings, pruning, burning brush and planting until June 30th. All trees large enough for fuel wood and not needed in the stand were cut into cordwood with the exception of the poplar which was large enough for excelsior wood and that was left to be cut and peeled. As soon as the sap started in May all of the poplar on the tract was cut because of poor growing conditions and peeled for excelsior wood. Many acres of this tract were covered with inferior growth of all species due to poor soil and fires which had burned parts of the tract several times. These areas were cut clean, brush burned and reforested with red pine. Trees were also filled in between natural growth where inferior and undesirable growth had been cut out. In all 30,000 trees were planted, twenty cords of wood cut, and it was estimated that 200 cords of poplar had been cut and peeled. All cordwood was turned over to relief agents for distribution. While practically the entire tract was covered, a few acres remain to be cleaned up and planted.

Carroll Tract, Warner

Work was started here April 16 and completed May 9. Practically the entire tract was gone over with weeding and improvement cutting. Defective trees and brush alongside the road were cleaned up and slash burned where visible from the road. Two large fireplaces were constructed near the highway, springs cleaned out and a number of trails opened up. About 15 cords of wood, largely gray birch, were cut for distribution to local relief agencies. Failed places in the plantations were filled with 500 white pine and 500 red pine trees. Ten men and foreman were employed for 14 days at a total cost of \$518, all of which was expended for wages.

Cathedral Ledge Auto Road

The White Horse and Cathedral Ledges were the second forest reservation acquired by the State. Located on the westerly side of the Saco valley and within a short distance of North Conway, these ledges are climbed by thousands of tourists every year. Through the efforts of State Senator George E. Russell of North Conway, who obtained rights of way from private parties, an auto road was laid with easy grade to the summit of Cathedral Ledges. This road follows the old cart path to the base of the Ledge where it crosses the plains to the north swinging northwesterly up a moderately steep grade to the summit. The summit of the Ledge is 700 feet above the plains and it is expected that this road will be extensively used during the summer season because of excellent views of the Saco valley and Echo Lake. Using state unemployment funds and men needing work from the towns of Bartlett and Conway, this road was commenced during May, 1934. Work was continued for five weeks with excellent results when it was postponed during the summer months. It required four more weeks during the fall to complete the road which is ten feet wide with plenty of turnouts. The road is one and one-half miles in length with a parking space near the summit for 50 cars.

Clough Reservation, Weare

Work was started here April 30, the roads having been in such poor shape prior to that date that it was difficult for men to get to the area. Weeding and thinning were carried on over about one-half the northern block of the tract, releasing pine by cutting gray birch and other hardwoods. Most of the 100 cords cut was trucked away as soon as cut. Ninety-eight acres were covered in these operations. About 12,000 bd. ft. of red pine was thinned out on the east side of the road and sold for piling. Four water holes were constructed and about $2\frac{1}{2}$ miles of trail. The campground was improved, a new diving board installed, the river bank protected from erosion and three leanto shelters constructed.

The Clough tract has considerable possibilities for recreational development and contains a number of points of interest, such as the Raymond Cave, Clough Boulder and lookout points on the cliffs above. A stone causeway was built across the river, which makes the west tract accessible to the public and will permit wood to be drawn from this part. Six lines of large cement culverts were laid to carry the normal summer flow of the river.

Open fields in the northern part of the tract were planted with 15,000 red pine and 200 red spruce.

The 20 men employed on this tract came from Dunbarton and Weare. Six hundred and thirty-one and one-half man days labor and 42 days for the foreman were put in at a total cost of \$2,396.68. Truck hire and materials amounted to \$166.68. This reservation contains a large amount of pine timber which should be cut through occasionally selectively. There is also a quantity of dead and defective hardwood on the west tract, now accessible, which should be cut. It would be very desirable if some work could be carried on here each year and thus furnish employment during the winter months.

Connecticut River Tract, Charlestown

Work began here May 2 and continued until June 29. During that last month 15 men and foreman were employed, all of whom came from Charlestown. Forest improvement work was completed on the east side of the ridge all the way to the top. Two hundred and nine and one-quarter cords were obtained in these thinnings as well as 604 chestnut fence posts. There were already 254 cords of fuelwood cut by CWA piled on this area so that $463\frac{1}{4}$ cords of fuelwood will be available to the relief administration during the winter of 1934-35. In addition, 7,000 bd. ft. of white pine logs were cut and sold on an area which burned over early in the spring.

The ridge on this tract affords a very pleasing view of the Connecticut river and valley, and a leanto of dead chestnut was built in order that picnickers might enjoy it. A trail

along the ridge, in addition to serving as a fire break, links up several old wood roads which have been cleaned out for bridle paths and trails. All trails were marked with signs. A fireplace and benches were also built near Miner's Falls. An old truck road was improved up to a point where the wood is to be landed and 21 small water holes were built. Six thousand red pines were planted. The cost for the 518½ man days was \$1,895.10, of which \$30.60 was for truck hire.

A good deal of work remains to be done on the west slope of this tract, which, however, is younger growth and will yield less wood from thinnings.

Contoocook Tract, Hopkinton

A crew of 10 men and foreman were employed here from April 6-26 and May 31-June 6. Nearly the entire area was covered by weeding, improvement cutting and some pruning. All the plantations were released. Four cords of peeled poplar were cut and sold and 37 cords of fuelwood cut for relief agencies. A log leanto and fireplace were so located as to give a pleasing vista of the covered bridge and Contoocook River. Boundary lines were repainted. The time, which includes that spent on Craney Hill and Ames tracts, was 186½ man days' labor and 20 for foreman, the cost being \$697, entirely wages. There is very little more work which is immediately needed on the Contoocook tract. A few acres in the northwest corner can be thinned and some poplar cut and peeled along the railroad.

Craney Hill Tract, Henniker

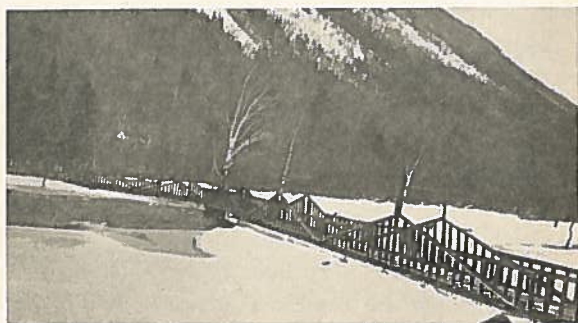
All plantations here were weeded and a picnic ground and fireplaces established along the roadside. Four cords were cut and the roadsides cleaned up. All of the stands on this tract are young.

Ames Tract, Henniker

Eight acres were weeded on this tract in connection with work on the Craney Hill and Contoocook Tracts. Little additional work needs to be done here at present.

Conway Common Lands

Through unemployment funds Conway and Eaton men were engaged on improvement work on this reservation. Thirteen thousand Norway spruce were planted on the remaining open areas. Hardwoods overtopping the older plantations were removed on an area of about fifty acres. A mile of fire line has been built and a waterhole constructed for fire protection. Two parking spaces have been built for the benefit of those using the greatly improved road over the mountain from North Conway to Chatham. The spring was cleaned out and rocked up and a half mile of trail improved toward the summit of Black Cap. Several cords of wood resulting from the improvement work was given to the welfare department.



Willey Dam, Crawford Notch Reservation.

Crawford Notch

During the month of June 1934, State unemployment funds were used to carry out certain necessary work in Crawford Notch. It was decided to employ 20 men and a foreman from Berlin to repair the dam in the Saco river opposite the Willey Camps and to do other necessary work at the old camp ground. The dam was reinforced with additional planking, new gates built and the walk over the dam improved. Needed development was carried on at the camp ground. Alders and bushes were cut out and one-half an

acre surfaced with gravel. This camping place is being increased in size by the building of a road along the easterly side of the Saco to an attractive grove of spruces and white birches. Other work projects undertaken were clearing trails, removing unsightly trees near the Willey House site and minor building improvements.

Everett Tract, Dunbarton

About 6.75 cords of poplar were peeled and sold from this tract, netting \$33.75. A large waterhole was dug by the road. The costs are included under the Clough tract, which it joins at one point.



*Type of bath houses erected on minor State Recreational areas.
Each building contains ten dressing rooms, five to a side.*

Forest Lake Dam, Whitefield

A cement dam, 100 feet in length and six feet high was constructed at the outlet of Forest Lake. It replaces an old wooden structure which leaked to such an extent as to lower the entire level of the lake and greatly depreciate recreational property. An old road, starting at the Littleton-Whitefield highway, 2.3 miles in length, was reconstructed.

Fox Reservation, Hillsboro

Work started April 3 and continued until June 30. Here a large part of the work was devoted to other projects than forestry operations in order to make permanent improvements. Three dams, two truck roads, a lookout tower, 3 gates and various construction work on the laboratory, museum, nursery and house occupied a large share of the time. Many experimental plantings and other research work were carried out. For two weeks one man was kept engaged in painting trail signs for the Fox and other reservations. About 20 cords of wood and 40 cords of poplar were cut in thinning operations and 27,600 trees were planted, exclusive of nursery operations. Ten men were employed constantly, and during the last month 20 men and 2 foremen. Owing to the depressed condition of the woolen industry there were a number of unemployed in Hillsboro. Eight hundred and twenty-seven man days' labor and 74 man days for foremen were consumed, at a cost of \$2,646.60 and \$370 respectively. Truck hire amounted to \$135.26 and supplies and materials \$19.71 and \$332.46. The total cost of the project was \$3,504.03.

Much additional work, especially road construction, is desirable on the Fox tract, in order to make all stands more accessible.

Franconia Notch

There was little opportunity for the traveler who wished to camp in Franconia Notch, until Federal and State funds were available for relief work. Campers and picnickers that were left largely to themselves, chose locations at random, which, without proper accommodations could not remain attractive or satisfactory. Camping and cooking fires that were scattered in various places caused concern, while the miscellaneous effects of roadside camping frequently spoiled and detracted from the natural beauty of the Notch.

To relieve this situation a relief project was started at Lafayette Place to provide a new camp ground for the accommodation of all who wished to pitch their tents. Other

work was also carried on due to the unemployment in adjoining towns. Work was started in November, 1933, and when CWA work terminated April 1st, crews were continued on Forestry Relief Funds.

The stumps were dug and the holes filled on an acre of the new Lafayette camp ground. Two thousand feet of water pipe was laid under ground to supply pure water to the camp and picnic area. An acre of growth was opened up on the west bank of the brook and just below Lonesome Lake trail for a picnic area. A foot bridge was built across the brook connecting the parking space with the picnic area and water piped across the brook to the parking area. A two-room camp was built for the use of CCC foremen and a four stall garage built for the use of CCC trucks. Dead and broken trees and unsightly accumulations of brush along two miles of roadside south of Echo Lake were removed and all dead and down material on five acres surrounding Echo Lake Tea House piled for disposal. About fifty cords of wood was saved from roadside improvement and other work and a few logs cut and skidded for bridge work. Numerous other small jobs were done in connection with CCC boys and log buildings are under construction which will furnish quarters for a caretaker and necessary accommodations for the public.

Governor Wentworth Farm

Plans for improvements on the old Governor Wentworth tract in Wolfeboro for the season of 1934 called for the widening and grading of the entrance road from the main highway to a point on the westerly side of the tract. This work has been completed. Other work undertaken was the clearing of juniper bushes, gray birches and weeds from the location of the old buildings. All of the old walls and foundation have been located and later will be appropriately marked. In the cellar of the old house grew three large elms and during a severe wind storm in July, 1934, one of the elms was blown over. While clearing away this elm certain bits of glass, crockery and other articles were found and it was decided to clean up the cellar hole and restore the

walls. During this work in October and November many valuable relics were located buried deep in earth and old bricks. Workmen found an old English penny dated 1753, a silver spoon, several H and L hinges, three old scythes, an ancient coffee mill, knives and forks, parts of old andirons, bits of china and melted glass and a brick with the date 1769. These articles have been saved and will be placed in a small historic museum, a part of the caretaker's house. It is hoped that other relics now in the hands of private parties will be loaned to the State for exhibition purposes.

Harriman-Chandler Reservation, Warner

Work started here on May 11 as soon as roads were passable, using the crew from the Carroll Tract. The entire southeast side of Stewart Peak was covered by stand improvement work, releasing plantations and younger trees of valuable species by felling or girdling worthless trees. Only about 6 cords of wood were put up because of the steep and inaccessible location. The trees released were chiefly spruce, white ash, white and red pine and red oak. Later, a second crew was put to work on the west side of the mountain and thinned and weeded a small area along the old town road to Waterloo, this operation yielding 53 cords of fuelwood. In all, 217 acres were covered in stand improvement work.

Fire protective improvements included the construction of five water holes and about one-half mile of firebreak along the ridge top. The six miles of foot trail and truck road constructed also render the tract more accessible to fire fighters. Three log leanto shelters were built, one of peeled poplar on the southeast side near a brook, one near the summit and another at the base on the west side, the latter two of peeled spruce logs obtained from thinning dense stands of spruce. A large fireplace with chimney faces each camp. The roofs of the leantos are sod-covered, making an attractive appearance. A thirty-foot lookout tower of peeled spruce was erected on the summit of Stewart Peak. A ridge trail links

this tower with the one on the Warner Town Forest and two trails lead down the southeast side to the town road and one down the west side. In addition, two ski trails were constructed, one, known as the Mink Run from the tower and upper leanto, northwesterly to the west leanto at the end of the truck road leading to Waterloo, and one on the southeast side, utilizing existing open slopes. The Mink Run trail was laid out in co-operation with Charles N. Proctor. An old road was improved, making it possible to drive directly to the base of this trail.

All men employed in the work came from Warner, transporting themselves to and from work. A total of 481 man days and $50\frac{1}{2}$ days for foremen were expended at a cost of \$1,829.92, of which \$24 was for truck hire and \$14.62 for supplies, the rest being wages.

Hubbard Hill Tract, Charlestown

Work was carried on here from June 2-29, with 10 men who came from Charlestown. Most of the work was centered on reduction of fire hazard by opening up old wood roads and constructing water holes for use in fire fighting. Twelve of the latter were made and about 12 miles of road opened up. One leanto camp was built near the northern boundary. Forty-nine cords of wood were cut in release and improvement work near the highway. Most of the trees cut were scattered "wolf" trees left from logging. The cost for the $208\frac{1}{2}$ man days and 22 days foreman was \$778, all of which was for labor. A large amount of work needs to be done here and several hundred cords of wood could be cut with benefit to the forest.

Mascoma State Forest, Canaan

During the period of June 22 to June 30, 1934, which followed the CWA projects, work was conducted on the above mentioned state tract

The crew consisted of ten men and one foreman, all from the town of Canaan. There were fire trails opened up on this tract which totaled at least three and one-half miles. These

trails were cleaned up in such a manner that they made the entire tract open to the public. Cord wood was cut along these trails opening up young valuable growth and removing all inferior growth, also in one section cord wood was cut taking out old hardwood trees. In all there were 142 cords of wood cut and piled along the trails where it could be easily loaded or roads swamped to it.

This covers the work which is urgently needed on this tract at the present time.

Mast Yard Tract, Concord-Hopkinton

This 400 acre tract of plantations, ranging in age from 5 to 15 years, was partially improved as a CWA project which terminated March 26, 1934. Work was resumed April 6 as one of the Department's "Forest Work Projects" and discontinued June 9, 1934.

Release cutting and planting formed the major part of the improvement work on this latter project. Hardwoods which interfered with the growth of the young planted pine were removed; others were left for the beneficial effects of the shade on the soil and protection afforded against weevil damage. Various "failed" spaces were planted with 11,000 white and Norway pine.

The lower branches of the hard pine growth, used as a nursery crop for a portion of the 15-year-old planting, were removed to prevent damage to the tops of the planted pine. An experimental plot of one acre was laid out in this hard and white pine mixture. All hard pine in the plot were girdled to determine the feasibility of this method of eliminating the nurse crop which has admirably served its purpose.

Eight acres of more mature pine growth, located in the Southwest corner of the tract, were improved through the removal of hardwood and suppressed pine.

All brush was cut from the fireline bordering the railroad right-of-way and 22 stumps removed both to reduce the cost of plowing and to make the fire-line more effective.

A crew of 10 men and 1 foreman, using a total of 22 individuals from Concord and Hopkinton were provided with 395 man days' work; 310 acres of forest land improved and 83 cords of wood made available for county relief.

This emergency relief work nearly completes immediate improvement necessary.

Merrimack River, Boscawen

Many auto parties stopping at this spot on the D. W. Highway showed its appeal to the traveling public, although no conveniences were provided. With this use indicated, work was started to add accommodations that were needed. A log bridge with stone abutments was built across a small brook to make more area available. This permitted one-eighth of a mile of one way road to be built, from the lunch area back 300 feet to a spot developed for an over night camp area, and thence to the D. W. Highway again. Places for camp fires were made inside this circular road which served as a fire line, and the supply of drinking water was piped under ground to a more convenient point. Two toilets of the latrine type were built nearby, the remains of an old sawdust pile trucked away and the whole place cleaned up. The project started May 27th with a ten man crew and finished June 30th. Further work and development should depend on the public use of this area as a picnic and camping ground.

Forest Nursery, Gerrish

On April 9th a small crew started the clearing of the banks and stream-bed of Stirrup Iron Brook for a proposed dam. The crew was increased to twenty men before the employment terminated June 30th.

The main part of the work was building a rock crib dam across Stirrup Iron brook and clearing flowage on the Nursery addition in Salisbury. The dam was 70 feet long and 10 feet high with a large spillway and small sluice gate. The face of the dam and spillway and gate were all double

planked and the dam filled with rock. All logs and plank were hemlock and were creosoted. The flowage area of $2\frac{1}{2}$ acres was covered with hardwood growth, which was cut into wood, brush burned, stumps dug and blasted, and most of the area cleared. Some of the stumps are left and the top soil of the flowage area would be valuable in the Nursery if it could be handled with relief work.

Two acres of young pine were cleared of suppressed trees and brush. Two acres of mixed growth was cleared of popple and grey birch and 2500 trees planted to fill the stand. In all, thirty cords of wood were cut from the three acres. There is still much work that should be done around the pond as many people used it for swimming and picnicking during the summer and it will eventually furnish water to the Nursery area.

Powow River

The Powow tract at South Hampton includes old fields, grown up pasture and cut over woodland. The hardwoods on twelve acres were cut yielding 25 cords of wood. Open spots were later planted together with the remaining field land. A small amount of pruning was done on pines two to six inches in diameter. An old road leading through the lot from one town road to another was cleared and graded. Two stone culverts were built and ditches opened. The road was improved only to the extent of allowing free access to the reservation for fire protection. Two springs were cleaned out, and a stone curb with well sweep and bucket built over one. Two cellar holes were graded and a nearby plot of ground levelled for a baseball field.

Work started April 16 and was terminated June 23. The wood was used locally for the poor and some was used at the town hall.

The baseball field is still rough and should be graded to a greater extent and the infield covered with loam. More improvement work can well be done in the wooded area which will also yield cord wood.

Scribner-Fellows, Ashland

This area of young mixed growth located near Ashland village offered a good opportunity to do forest improvement work. The most of the lot had come up naturally to oak, birch, maple and pine while poorly stocked areas were planted years ago.

Ten acres of these plantations were pruned and released, and fifty acres of the natural growth was covered in order that the best trees might become dominant. One thousand white pines were planted in small openings. Half a mile of roadside along an old road that runs through the tract was cleaned up, and one-fourth mile of roadside along the Ashland-New Hampton road was thinned and cleaned. Brush from these operations were hauled to the town dump and burned. Thirty cords of wood saved from the work was given to the needy and exchanged for truck hire. The crew of ten men and a foreman worked ten weeks, finishing June 30th and left considerable of the area still to be covered.

Sentinel Mountain, Piermont

At Sentinel Mountain the work followed CWA and relief projects and employed 10 men and a foreman from April 30 to June 30. Releasing of plantations and clean cutting of cheap hardwoods for planting covered most of the work under this fund.

There were 13,000 Norway spruce planted by the crew on cut over areas. A road that leads through the center of the tract was improved and made passable. Two wells on the property were cleaned and made into good shape. The water line was dug up and repaired so that water is available and a water hole is in the process of construction. Sixty cords of wood were cut and the wood distributed to families on the welfare list in nearby towns. Many acres remain to be improved and the water holes should be completed.

Soucook Tract, Loudon

The Soucook Tract of 50 acres, a cut-over area of mixed young pine and birch, inferior hardwoods and brush and

scattered clumps of pine, was partially improved as a CWA project which terminated March 26, 1934.

This project was resumed on April 6 on emergency forestry funds and discontinued June 13, 1934. The cutting of hardwoods and brush on the remainder of the tract was completed and then the work of pruning, thinning, weevil correction and planting was undertaken over the entire tract. Most of the slash was burned to reduce the fire hazard. A small spring of exceptionally fine water near the entrance was re-walled and cleaned out to a depth of five feet. Approximately 25,000 Norway, White and Scotch pine were planted in open areas and supplementally where necessary.

Fifty acres were covered in the improvement work; 26 cords of wood cut and turned over to the county relief organization. One crew of 10 men and 1 foreman, using 22 men from Concord and Loudon were provided with 426 man days' work. Necessary improvement work for the present has been completed.

Stockdale Tract, Manchester

Much forest improvement had been done on this area in previous years and an attempt was made in this work to put the buildings in good repair. Work began on May 6th and finished June 10th, with a small crew that averaged four men working almost entirely on building improvements. The roofs on the north side of the barn and middle section of the house were removed, reboarded and shingled. New floors were laid in two rooms in the house, the entire inside of the house was cleaned and small repairs were made. The ceilings were whitened and all wood work painted in the seven rooms. From the house to the road 125 feet of water pipe was laid so as to connect city water. The barn floors were partially repaired.

Three acres of scrub oak was cut at odd times to release planted pine when some of the men could not be used to advantage on other work. Further work needs to be done on both building and plantations in the near future.

Strawberry Hill

The forest growth on the Strawberry Hill tract, Bethlehem, when first acquired by the State in 1933 consisted of all species of valuable trees intermingled with scrubby worthless growth and weeds. A section of woodland badly in need of improving was selected for work by the unemployed during the month of June, 1934. The inferior crooked trees and bushes were removed and all brush burned. The remaining trees, mostly white birches and spruces, were pruned allowing a fine vista of the north mountains. A parking place for 40 cars was made at the head of Berkley Street with short trails leading to the park. A rustic shelter, seats and picnic tables have been provided making this spot very accessible and attractive. About 15 cords of wood were cut and distributed among the crew members.

Sugar Hill Tract, Bristol

This attractive woodland area of 57 acres, located at the edge of Bristol village, has been neglected for several years and offered an excellent opportunity for forest improvement work. Ten men started this project April 29th and worked almost entirely on forest improvement until June 30th. Judicious thinning was carefully done with all trees pruned and the brush dragged or hauled away and burned. About five acres of softwoods on the lower area were covered and ten acres of hardwood on the side hill. One hundred and fifteen cords of wood resulted from the work; the most of which was given to relief. Although necessary, a large amount of time was consumed in slash disposal. This section of the tract was converted into a woodland park with trails and lookoff that make it attractive for both summer and winter use. Much more of this work needs to be done at the first opportunity.

Taylor Tract, Concord

The seven acre Taylor Tract is partially covered with natural pine growth, the remainder having been planted to white and Norway pine.

This was solely a "Forest Work Project" starting June 6 and terminating June 28, 1934.

Improvement work consisted mainly of pruning both the white and Norway pine and correcting of weevil damage on the white pine. Three rows of pine were left unimproved along the boundaries of the tract to preserve its natural appearance and prevent the drying out of the interior. Brush was generally removed throughout the tract. Five hundred white pine were planted in several open areas. Elms overtopping the plantation in several places were girdled because of the likelihood of severe damage resulting if they were dropped. Other than a small amount of planting no further improvement work is necessary for the present.

A crew of 10 men and one foreman, using a total of 14 men from Loudon and Concord, were provided 143 man days' work. Five cords of wood were cut and turned over to the county relief for distribution to the needy.

Walker Tract, Concord

With the exception of three acres of large pine, this 47 acre cut-over tract has been reforested with white and Norway pine, Norway spruce, balsam, white cedar, white ash and poplar.

This tract was included in the Department's "Forest Work Project" program and partially improved. Work started May 7 and terminated June 30, 1934.

Interior hardwood species overtopping and retarding growth of planted stock were removed. The white and Norway pine were pruned and weevil damage corrected. Red Oak; white, yellow and black birch and ash were preserved and improved. Due to the brushy condition of the lot and the large amount of inferior hardwoods requiring cutting it was impossible to complete necessary improvement work. Slash was laid flat to hasten its early decay and reduce fire danger.

A crew of 10 men and one foreman, using 16 men from Concord and Boscawen were furnished 408 man days' work. Approximately 30 acres were improved and 15 cords of wood turned over to the county relief organization.

Type Mapping

Type maps were made of all state areas during the past year that were within the working circles of the five state CCC camps. There were, however, state areas that could not be reached from these camps and with the need of such maps four men worked approximately three weeks and mapped eleven additional areas. The tracts covered were Harriman Chandler, Carroll and Davisville in Warner, Ames and Craney Hill in Henniker, Contoocook in Hopkinton, Clough in Weare, Everett in Dunbarton, Strawberry Hill in Bethlehem, Livermore Falls and Blair in Campton and totaled 1200 acres.

Greenland Cemetery

This project consisted mainly of cemetery improvement, where an abutting land owner gave the town a piece of land. A fence was relocated and built and the road formerly used graded over for additional lots and a new road constructed. The new land was cleared of unsightly apple trees and a row of maples set out. Several large locust trees were removed and groups of white and red pine were planted. Most of the wood cut was used for relief purposes.

Fish and Game Project in Jackson

The Forestry Department co-operated in this project with the Fish and Game Department in building rearing pools in the town of Jackson on the White Mountain National Forest. The work consisted of clearing growth about the rearing pools and construction of a road from the highway. Over 600 cubic yards of gravel were contributed by Mrs. Edith C. Baker, a summer resident, and was used in grading the road and around the pools.

Sandwich Notch Park

This project consisted of improvements that made natural features of the Park accessible to the public. A parking place was leveled and a circular one-way road built to enable visitors to return to the main road about 150 feet south of the entrance.

Two new bridges were built across the outlet of the pool below the falls and a stone walk built out into the pool. A cave near the falls was made accessible by a pole bridge across a corner of the pool. The trails to the falls and to Cow Cave were improved and a pole bridge built across the river just above the ledges where there are facilities for camp fires.

The park, with its falls, caves, ledges and boulders, is increasingly popular each year.

Mt. Willard Auto Road

For 50 years or more people have used mountain wagons to carry them from the Crawford House Station to the top of Mt. Willard. In 1913 the State acquired Crawford Notch with the greater part of this mountain located within the reservation. After the passing of the stage coach and the mountain wagon, the burro was used as a means of transportation. The original excellent road has recently been neglected and was early listed as a work project to be carried out by the CCC side camp located in Crawford Notch. On account of the large amount of work needed on this road it was decided to use State unemployment funds to complete as much as possible of this road during the fall of 1934. For ten weeks, 30 men needing work in Bartlett and Twin Mountain were engaged in this undertaking. The total distance from the Crawford House Station is one and one-quarter miles with the lower portion crossing hotel property and land of the White Mountain National Forest. The parking place, about 600 feet from the summit, will accommodate nearly 30 cars. The project is about half completed and is expected to be finished by men from the CCC side camp in Crawford Notch during the 1935 season.

SKI TRAIL CONSTRUCTION ON STATE LANDS



UNTIL recent years skiing in New Hampshire has been of minor consideration and indulged in only by local ski enthusiasts or local clubs. Not until the highways were opened and made passable did the public think of winter sports. The coming of the snow trains, special ski instruction by ski experts and the CCC Camps were additional factors in the unusual interest that the public has taken. The State Development Commission took the initiative in calling a general meeting in October, 1933, of all those interested in skiing. A committee was organized to locate suitable ski trails of different grades in many sections of the State. Experts were hired to study and spot the trails which seemed suitable for public use. State and private funds were used on this work. Many of the trails were located on the White Mountain National Forest; some on State Forests and some on public and private lands. For several months during the fall of 1933 there were crews from all CCC Camps cutting out these trails and runs and the approaches to them. The heavy snows during the winter of 1933 and 1934 offered exceptional opportunities to try out these trails. Just how many used these new runs is difficult to determine but an effort is being made to have registers at the foot of State trails to keep a record of those enjoying this sport. Snow trains brought thousands to New Hampshire during the winter and skiing lasted in Tuckerman Ravine until the last of May. Much work has been necessary during the past summer to complete these trails and it is hoped that the actual cutting and clearing of these trails has been completed. This interest in skiing has greatly helped many of the hotels who keep open house during the winter months; it has stimulated trade in all winter sports equipment and it has been beneficial to thousands who spent their week-ends on the ski trails.

The following trails have been constructed on State Reservations:

<i>Reservation</i>	<i>Name</i>	<i>Miles</i>
Mt. Cardigan	West Side	2.5
Mt. Cardigan	Duke's	1.
Mt. Cardigan	Alexandria	2.5
Franconia	Richard Taft	2.1
Franconia	Cascade Brook	1.7
Pawtuckaway	Middle Mountain	1.
Merriman	Maple Villa	2.5
Kearsarge	North Slope	2.
Forest Lake	Dalton Mountain	1.5
		<hr/> 16.8 miles

The Development Commission have prepared a booklet giving a list of all ski trails with a map including runs made on Federal, State and private lands. Other trails upon which work has been done from State CCC Camps in co-operation with the Forestry Society and the National Forest are Sunapee Mountain ski trail, 1.5 miles, near Newport, N. H., and the Liberty ski trail, 3 miles, at Chocorua.

During the fall of 1934 certain minor improvements were undertaken by the Department as follows:

Endicott Rock, construction of railing to concentrate the parking of cars and the renewal of the pillars and the lighting system to the historic Governor Endicott Rock.

Pillsbury Reservation, the restoration of the Butterfield dam, by placing in position the old stones and reconstruction of the spillway.

Wadleigh Park and Kingston Lake, the construction of a cabin on each tract for the use of a caretaker.

Monadnock, construction of two sanitary toilets and addition to the caretaker's cottage.

EMERGENCY RELIEF OF UNEMPLOYMENT
Fiscal Year Ending June 30, 1934

FUNDS AVAILABLE						
Transfers from Section 8, Chapter 150, Session Laws of 1933.....						
<i>Names of Projects</i>	<i>Supervision</i>	<i>Labor</i>	<i>Trucks</i>	<i>Materials</i>	<i>Equipment</i>	<i>Other Costs</i>
<i>Total Costs</i>						<i>Total Costs</i>
ADMINISTRATIVE						
Ski Trails	\$340.90	.....	.....	.....	.....	\$340.90
STATE RESERVATIONS						
Forest Lake (Road)	160.00	\$1,858.80	\$274.17	\$199.10	\$25.60	2,497.67
ACQUISITION OF LAND						
Belknap Mountain .....	.....	.....	.....	.....	.....	250.00
Black Mountain .....	.....	.....	.....	.....	\$250.00	2,750.00
Forest Lake .....	.....	.....	.....	.....	2,750.00	3,000.00
Kingston Lake .....	.....	.....	.....	.....	3,000.00	3,500.00
Moose Brook .....	.....	.....	.....	.....	3,500.00	8,525.94
OTHER PROJECTS						
Pulpit Rock .....	.....	.....	.....	.....	.....	175.00
(Right-of-Way) .....	.....	.....	.....	.....	.....	110.00
Wadleigh Park .....	.....	.....	.....	.....	.....	110.00
(Commitments) .....	.....	.....	.....	.....	.....	110.00
TOTAL EXPENDITURES	\$500.90	\$1,858.80	\$274.17	\$199.10	\$25.60	\$18,310.94
						\$21,149.51
REPORT OF EMPLOYMENT						
Proportion of Funds Available Disbursed for Wages of Foremen and Workmen (Forest Lake Only)						
						9 %
<i>Occupation</i>	<i>Number of Men</i>	<i>Man Days Employed</i>	<i>Average Daily Rate</i>	<i>Total Earnings</i>		
Foremen	1	24	\$6.67	\$160.00		
Workmen	24	450	3.04	1,838.80		
TOTAL	35	474	\$4.22	\$1,998.80		

EMERGENCY RELIEF OF UNEMPLOYMENT
Fiscal Year Ending June 30, 1934

FUNDS AVAILABLE Section 7, Chapter 150, Session Laws of 1933							\$100,000.00
Name of Projects	Supervision	Labor	Trucks	Materials	Equipment	Other Costs	Total Costs
ADMINISTRATIVE							\$1,000.00
N. H. E. R. A.	\$1,000.00						1,000.00
Office		\$1,000.00					1,000.00
Field	1,643.33						1,643.33
Market Study						\$1,497.49	1,497.49
Ski Trails	1,500.00						1,500.00
Other Expenses		4.75		\$251.67			256.42
WATER HOLES FOR							
FIRE PROTECTION							
WHITE PINE BLASTER		17,831.70					17,831.70
RUST CONTROL							
STATE RESERVATIONS	3,176.00	17,823.97					20,999.97
Allen	110.00	595.20					705.20
Black Mountain	93.12	583.60		48.52			731.24
Blair	265.00	1,689.60					1,954.60
Carroll	70.00	448.00					518.00
Cathedral and							
White Horse Ledges	140.00	1,190.40	\$235.20	125.05			1,690.65
Clough	210.00	2,020.00	154.45	12.25			2,396.68
Connecticut River	205.00	1,659.50	30.60				1,895.10
Contoocook	100.00	597.00					697.00
Conway Common Lands	120.00	500.30					620.30
Crawford Notch	120.00	1,305.60	283.10	650.60	\$45.08		2,404.38
Endicott Rock					28.13		28.13
Forest Lake	233.32	1,056.16	88.57	679.16	103.09	16.37	2,176.67
Fox	370.00	2,646.60	135.26	352.17			3,504.03
Franconia Notch	455.00	3,791.60	144.03	1,602.30	102.36		6,093.29
Governor Wentworth	90.00	980.80	335.20	27.97			1,433.97
Harriman-Chandler	252.50	1,538.80	24.00	14.62			1,829.92
Hubbard Hill	110.00	668.00					778.00

Mascoma	205.00	1,146.80	.....	.....	.....	1,351.80
Mast Yard	212.19	1,128.30	.....	.....	.....	1,340.49
Nerrimack River	130.00	873.00	194.80	91.09	.....	1,288.89
Nursery	307.50	2,269.00	228.73	533.12	15.16	3,358.16
Pawtuckaway .....	.....	.....	.....	.....	4.65	750.00
Pillsbury CCC Camp .....	.....	.....	.....	.....	300.00	300.00
Powow River	160.00	827.70	37.80	4.20	.....	1,029.70
Red Hill .....	.....	.....	.....	25.00	.....	25.00
Scribner-Fellows	205.00	1,284.20	40.80	.....	.....	1,530.00
Sentinel Mountain	196.24	1,232.80	.....	12.48	.....	1,431.52
Soucook River	210.00	1,228.80	.....	.....	5.25	1,444.05
Stockdale	110.00	544.00	6.00	153.22	.....	813.22
Strawberry Hill	112.50	751.20	128.40	10.80	.....	1,002.90
Sugar Hill	210.00	1,441.80	122.90	4.58	.....	1,679.28
Taylor	70.00	412.80	.....	.....	.....	482.80
Walker	187.50	1,188.40	.....	.....	.....	1,375.90
Wellington Beach .....	.....	.....	.....	27.00	.....	27.00
White Lake .....	.....	.....	.....	185.86	.....	185.86
Mapping Reservations	96.88	138.00	.....	2.30	20.64	257.82
OTHER PROJECTS .....	.....	.....	.....	.....	.....	.....
Greenland .....	.....	216.00	114.40	.....	.....	330.40
Jackson-Rearing Pool	44.80	388.80	66.40	.....	.....	500.00
Laconia-Opeechee Park .....	.....	.....	.....	295.09	.....	295.09
Sandwich .....	.....	59.84	10.00	.....	.....	69.84
TOTAL EXPENDITURES	\$12,720.88	\$72,959.02	\$2,380.64	\$5,137.16	\$270.94	\$96,057.79
BALANCE UNEXPENDED .....	.....	.....	.....	.....	.....	3,942.21
TOTAL APPROPRIATION .....	.....	.....	.....	.....	.....	\$100,000.00

REPORT OF EMPLOYMENT						85 %
Proportion of Total Expenditures Disbursed for Wages of Foremen and Workmen						
Occupation	Number of Men	Man Days Employed	Average Daily Rate	Total Earnings		
Foremen	56	1,861	\$4.61	\$8,577.55		
Workmen	1,491	23,739	3.07	72,959.02		
TOTAL	1,547	25,620	\$3.18	\$81,536.57		

THE LUMBER CUT—1932-33



INCE 1929 the lumber cut of this state has steadily declined until 1933 when an increase was indicated over the previous year. This tended to show that the lumber market has become more or less stabilized.

The report of 1934 cuttings is not yet available owing to the fact that the lumber cut cards cannot be sent out until after January 1st of the year following that when the cutting was done. It is, however, quite evident from estimates received and the Department's record of operating mills that the cut for 1934 will show an increase over 1933, thus indicating a further improvement in the lumber market.

The operator's reports for 1929 indicated that the lumber cut of that year was about an average of the previous years since these reports were required. The lumber cut for 1929 and for 1931-33 inclusive, is herewith submitted.

THE LUMBER CUT

<i>Year</i>	<i>Cutting between 100 M & 250 M</i>	<i>Cutting between 250 M & 500 M</i>	<i>Cutting between 500 M & 1000 M</i>	<i>Cutting over 1000 M</i>	<i>Out of Hard Woods</i>	<i>Out of Hemlock</i>	<i>Out of Spruce</i>	<i>Out of Pine</i>	<i>Total Out</i>
1929	43	32	51	67	39,183 M	35,825 M		145,682 M	220,690 M
1931	17	17	28	34	18,150 M	21,180 M		73,335 M	112,665 M
1932	14	14	17	15	8,600 M	8,185 M	6,553 M	38,917 M	62,255 M
1933	23	23	22	28	16,578 M	5,364 M	8,023 M	60,057 M	90,202 M

In accordance with numerous requests to show how spruce and hemlock had been cut, the tabulation for 1932-33 is given accordingly. The 1929 and 1931 figures give the cut of these species under the same heading.

It will be noted from this summary that the 1931 lumber cut fell off nearly one-half from that of 1929, and that a further equal decline took place in 1932. However, the cut for 1933 showed an increase of about one-third over the previous year. It also indicates that the number of operators cutting the larger amounts declined in proportion to the cut, and in 1933 increased proportionately. This would seem to prove that many operators went entirely out of business in 1932, and that a few came back in 1933.

The tabulation of these reports indicate that at the peak of operations there were about 200 operators cutting the bulk of our timber. In 1932 the number was less than 40, but increased in 1933 to about 60 operators.

FOREST FIRE PROTECTION



FOREST fire control in New Hampshire has been a planned and state-wide function of the Forestry Department for twenty-five years. Previously, large-scale logging operations in the North, frequently wasteful and followed by fires, led public-spirited citizens to believe that unless definite steps were taken to curb fires and otherwise conserve our woodlands, serious consequences would ensue. After several unsuccessful attempts to bring about the enactment of necessary legislation, favorable action was taken in 1909. The forestry commission was authorized to employ a state forester, other laws were enacted and an appropriation, largely for the purpose of controlling fires, was made available. Immediately thereafter, forest fire wardens were named in all towns and cities, provision was made to share fire expenses with towns, co-operative arrangements were made with existing protective agencies and other forms of control were instituted.

As one result of the organization of this effective fire control program, New Hampshire became the first state to benefit from Federal co-operation under the terms of the Weeks Act, later and today known as the Clark-McNary law. The system then established functions to this day, its fundamentals having passed the test of time. After a quarter-century, the organization can legitimately claim to have justified the aims of its sponsors and to be ready for future exigencies.

Woodland constitutes nearly four-fifths of the total land area of the state. It is one of our most important natural resources. The utilization of its products employs thousands of lumbermen in the woods and workers in wood-using establishments. In its effect of controlling stream-flow, woodland is hardly less valuable, contributing greatly to the benefits derived from water-power. The recreational field is vitally concerned, being dependent on forests for scenic beauty, for hunting, hiking and camping opportunities, for the effect on fishing streams, ski trails, mountaineering and

other recreational pursuits. Our own people and multitudes of visitors demand and are willing to pay for the development of these recreational facilities. The development and operation of recreational enterprises has attained the rank of a major New Hampshire industry, employing men and capital from one year's end to the other. Beyond question, our economic welfare is tremendously dependent upon the proper management of our woodlands, one fundamental requisite being adequate fire control. Taxes levied on owners of woodland go a long way to swell town treasuries and no more important governmental service than fire protection can be rendered in return to these landowners.

Organization and Personnel

The mainstay of the forest fire service in the state is its personnel of forest fire wardens and deputies, one warden and a sufficient number of deputies functioning in each city and town. Upon them devolves the duty of preventing and extinguishing forest fires in their respective jurisdictions and they are compensated only for services actually rendered. They are appointed by the state forester upon the recommendation of Selectmen or other interested citizens and the state shares with towns the expenses they incur.

The office of forest fire warden has never been rich in pecuniary rewards but the service has attracted men of the highest standing in the community, all of whom have unceasingly and untiringly given of their best in serving their towns and the state. The record of their achievements is one of which New Hampshire is justly proud. After twenty-five years of constant endeavor, it is fitting to pay a richly deserved tribute to the men who have borne the brunt of the work in the field. Many of the original members of the organization have long since retired from duties become too arduous but a goodly number of the first wardens ever appointed are still active and valued members of the service today. The following wardens have served their towns continuously until the present time, having been the first incumbents in the office in their respective towns:

Twenty-Five Years of Fire Fighting

F. A. Barton, Lempster	Bernard F. Bemis, Harrisville
Richard Dearborn, Effingham	Edwin B. Edgerly, Tuftonboro
John F. Emery, Stratham	E. A. Farnum, Danbury
Fred E. Goodhue, Wilmot	Lester J. Hayden, Hollis
W. N. Judd, Pittsburg	William H. Knox, Madbury
Geo. E. Lewis, Newport	Ira S. Littlefield, New London
Arthur K. Marston, Loudon	W. H. Milton, Hopkinton
H. L. Pillsbury, Sutton	A. H. Post, Chesterfield
John E. Ray, Londonderry	F. M. Sargent, Sunapee
John H. Smith, Atkinson	Arthur W. Spring, Laconia
J. R. Turner, Wentworth's Location	Perley Walker, Grantham
	J. W. Wood, Washington
James D. Whittemore, Epping	

Within recent years, the wardens have given another striking demonstration of their interest in the work of forest protection by the organization on their own initiative of county associations in Hillsborough, Cheshire and Rockingham counties. The object of these associations is the development of better fire protective systems in co-operation with the Forestry Department and the promotion of friendly relationships between the members of the associations. Interesting meetings held monthly in successively different towns are invariably well attended, well managed, enthusiastic and thoroughly worthwhile. It is hope that wardens in other counties will organize in this manner in the near future.

The administration of state forest fire laws by the wardens is directed by district chiefs, each of whom has jurisdiction in a number of towns grouped according to topographic or other lines for effective supervision. In recent years, two blister rust control district agents have been given fire control duties in addition to blister rust control work and similar arrangements are soon to become effective in three other districts. Elsewhere, the secretary of the New Hampshire Timberland Owners' Association acts as district chief in a number of Coos county towns and the assistant county agricultural agent for forestry in Coos county also serves without additional pay in several Connecticut Valley towns.

The district chiefs assist the wardens in every way to carry out their duties and supervise the work of the lookout stations in their territories. They inspect portable saw mills, slash and other hazards, have charge of portable power fire pumps and other state fire fighting equipment in their districts.

The twenty-eight mountain lookout stations now maintained by the state, in addition to five Federal stations in the White Mountain National Forest, detect and report fires to the wardens, completing, so to speak, a veritable state-wide protective network of men and equipment which can be placed quickly in action. A good example of this integration is the manner in which a gubernatorial proclamation closing woodlands throughout the state may be announced. By telephone from Concord to the district chiefs who relay the information to the lookout watchmen in their districts for further communication to the wardens, the "ban" is thus promulgated in a very short time, usually within two hours.

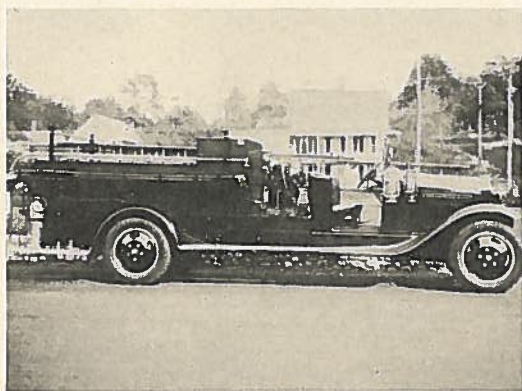
Other valued members of the forest fire service are the railroad section foremen and state highway patrolmen who are appointed, ex-officio, deputy forest fire wardens, the patrolmen of the New Hampshire Timberland Owners' Association, the administrative personnel of the White Mountain National Forest and a number of special deputy wardens who are so located as to be of great assistance. The whole force includes more than 1,300 men.

During the biennium, the establishment of Civilian Conservation Corps camps occurred and has proved to be of great value in fire control. Some 1,200 enrolled men in camps supervised by the Forestry Department have worked at a variety of tasks including such fire control measures as construction or improvement of lookout station towers, cabins, telephone lines and trails, water holes, cutting ski and foot trails, truck trails which facilitate quick entry into woodland with trucks and men for fire fighting, slash disposal and other work, not the least of which was direct fire fighting amounting to 1,853 man days. As a matter of policy, the men of the CCC are not used for fire fighting unless serious fires compel their use and district chiefs orders them to fires.

Pre-Suppression Equipment and Improvements

Portable power fire pump outfits for use in towns are maintained by the state at Thornton's Ferry, Deerfield, Keene, Short Falls, Gerrish and North Conway. These units are subject to call and may be had by notifying the district chiefs. They have been used at many fires, rendering valuable assistance.

Other equipment provided co-operatively by the state consists of hand water pumps purchased and sold to towns on a 50-50 basis. An annual appropriation of \$1,000 has been entirely used for this purpose, as well as additional sums otherwise made available. During the biennium, 85 towns have availed themselves of this plan to obtain good equipment at low cost.



Pumping outfits are purchased or built by towns for fire protection.

In a number of additional towns, portable pumping outfits have been acquired. This form of protection is coming to be recognized as an efficient, all-purpose unit, especially where no other apparatus is available or where only limited water supplies are available. The cost is relatively less than that of the larger truck pumpers, making the equipment available to many towns which could not assume the expense of larger units.

In this connection, the construction with "relief" funds during 1934 of water holes for fire protection is interesting. This type of protection is not new but the comparatively large-scale operations of the past year have given the work an impetus which is bound to be maintained, at least partially. The following tabulation gives the names of towns in which the work was done, the names of agencies sponsoring the projects and the results accomplished. State co-operation was given to towns in the form of cash allotments of \$320 for payment of wages to unemployed workmen while the



Water-hole surrounded by wire fencing to keep out children and animals.

towns assumed the costs of necessary supervision, tools, materials and other items. About five water holes, on the average, were thus constructed in each town, at a total cost probably not in excess of \$100 per hole. Small brooks were diverted into nearby excavations, small log or earth dams were made, approaches leading to water in swampy areas were constructed and resulting water supplies were fenced for safety of children or animals. Signs where necessary to indicate the location of water holes were posted along roadsides, at junctions, etc. The use of water holes in several cases has already been instrumental in preventing much property loss.

WATER HOLE CONSTRUCTION FOR FIRE PROTECTION

Name of Town	State Funds		OOO	OWA	Total
	Spring '34	Fall '34			
Allenstown	4	4	...	...	8
Alton	4	...	...	...	4
Amherst	...	6	...	6	12
Antrim	...	8	...	...	8
Atkinson	...	...	...	...	0*
Barnstead	2	...	...	...	2
Barrington	...	1	...	...	1
Bartlett	7	...	...	...	7
Bedford	...	...	4	2	6
Bennington	3	...	...	2	5
Bethlehem	3	...	...	...	3
Bradford	3	...	...	...	3
Bristol	...	...	3	...	3
Brookline	5	...	...	...	5
Candia	4	...	...	...	4
Chatham	...	23	...	...	23†
Chester	...	4	...	...	4
Chesterfield	6	...	...	...	6
Chichester	...	4	...	...	4
Conway	5	...	...	...	5
Cornish	1	...	...	...	1
Danbury	...	...	2	...	2
Danville	...	2	...	...	2†
Deerfield	...	...	2	...	2
Deering	4	...	...	...	4
Derry	5	...	...	1	6
Dublin	15	...	...	...	15
Dunbarton	25	5	...	...	30
Durham	...	5	...	...	5
East Kingston	...	1	...	...	1†



Many water-holes have a storage capacity of 12,- 15,000 gallons.

Effingham	...	11	...	...	11†
Epping	...	4	...	...	4
Epsom	...	...	1	...	1
Exeter	5	...	...	...	5
Fitzwilliam	...	2	...	...	2
Franconia	5	...	...	...	5
Freedom	...	...	4	...	4
Fremont	...	...	2	...	2

WATER HOLE CONSTRUCTION FOR FIRE PROTECTION—*Continued*

Name of Town	State Funds Spring '34	State Funds Fall '34	CCC	CWA	Total
Gilford	8	1	...	...	9
Gilsum	...	3	...	...	3†
Goffstown	...	1	...	...	1†
Goshen	...	...	8	...	8
Greenland	4	...	...	...	4
Greenville	...	5	...	...	5†
Hampstead	6	...	...	...	6
Hampton	3	...	...	...	3
Hampton Falls	...	4	...	...	4
Hancock	...	...	...	...	0*
Hanover	...	6	...	...	0*
Harrisville	...	6	...	...	6
Haverhill	3	...	...	...	3
Hillsboro	10	...	...	...	10
Hollis	6	...	...	...	6
Hooksett	8	5†	...	...	13†
Hudson	...	5	...	...	5
Jackson	...	1	...	...	1
Jaffrey	...	...	2	...	2
Kensington	...	...	...	...	0*
Kingston	...	2	...	...	2
Lee	...	7	...	...	7
Lempster	...	...	4	...	4
Litchfield	6	...	...	...	6
Londonderry	...	...	...	...	0*
Lyme	...	...	...	...	0*
Lyndeboro	...	5	...	...	5
Madbury	2	...	...	...	2
Madison	4	...	...	...	4
Marlboro	3†	...	...	...	3
Marlow	8	...	...	...	8
Mason	5	...	...	...	5
Merrimack	7	...	...	...	7
Milford	11	10	...	2	23
Mont Vernon	10	...	...	1	11
Moultonboro	8	...	...	...	8
New Boston	...	2	...	...	2†
Newbury	...	...	...	...	0*
New Durham	5	...	...	...	5
Newfields	...	3	...	...	3
New Ipswich	4	...	...	...	4
Newton	...	5	...	...	5
North Hampton	6	...	...	...	6
Northwood	4	...	...	...	4
Nottingham	...	...	...	...	0*
Orange	5	...	...	...	5
Ossipee	...	...	1	...	1
Pelham	...	15	...	...	15
Peterborough	4	...	...	5	9
Plaistow	...	5	...	...	5
Plymouth	...	4	...	...	4
Raymond	...	...	2	...	2
Rindge	...	...	5	...	5
Rumney	1	...	...	...	1
Salem	...	5	...	...	5
Sandown	7	...	...	...	7
Sandwich	...	...	3	...	3
Seabrook	6	...	...	...	6
South Hampton	2	...	...	...	2
Stratham	2	...	...	...	2
Swansey	...	4	...	...	4†
Tamworth	...	...	10	...	10
Thornton	4	...	...	...	4
Troy	...	12	2	...	2
Wakefield	...	12	...	...	12
Walpole	...	1	...	...	1†
Warner	11	1	...	...	12
Warren	...	1	...	...	1†
Washington	...	...	3	...	3
Waterville	4	...	...	...	4

WATER HOLE CONSTRUCTION FOR FIRE PROTECTION—*Concluded*

Name of Town	State Funds	State Funds	CCC	CWA	Total
	Spring '34	Fall '34			
Weare	8	...	...	...	8
Westmoreland	6	...	...	...	6
Wilton .....	...	5	...	...	5
Windham	4	...	...	...	4
Windsor	6	...	...	...	6
Wolfeboro	9	...	...	...	9
Woodstock .....	...	...	...	...	0*
Total	316	198	58	19	591

*1934 allotments to be used during Spring, 1935.

†1934 allotments partially expended, remainder to be used Spring, 1935.

‡Started by CWA.

The construction of water holes has been an ideal project for relief of unemployment, employing hundreds of men in useful work. The costs involved have been comparatively moderate and the greater portion of the expenditures covered compensation of workmen. Plans for the future do not include further cash allotments to towns, for the present, at least, but the employment of CCC men in this work to a greater extent than before is already outlined.

Other work projects for relief of employment which may be considered as fire control improvements, directly or indirectly, are discussed elsewhere in this report.

Review of Fire Conditions

A fairly large number of fires occurred during the biennium but the area burned was quite low. Except for comparatively short periods, good fire weather was experienced. The fall of 1932 followed a hot, dry spring period and the drought was not broken until September when nearly eight inches of rainfall was recorded in Concord. Fires in July, August and September were unusually numerous, clearly reflecting the effects of the summer drought.

The year 1933 saw comparatively heavy rainfall but May, June and July were dry and many fires occurred—most of the 1933 fires, in fact. Notably bad fires occurred in Merimack, Hooksett and Alton. The first was attributed to careless smokers picking flowers and, according to the warden and other eye-witnesses, spread with incredible speed. An area of 1,800 acres was burned and total damage exceeded

\$30,000. It was the most disastrous fire in recent years and the resulting devastation was seen by the thousands of person travelling the Daniel Webster Highway at the point across which it burned. The Hooksett fire was notable for its large area, as was the Alton fire, the latter also having cost a very large amount for suppression. In these two instances, however, lands burned were not heavily stocked and the growth was of comparatively low grade.

The spring of 1934 was quite active with small fires occurring in April and May. Precipitation was slightly greater than normal and temperatures were somewhat cool, however, with the result that no serious fires were recorded. In June, a short dry period rendered conditions hazardous in the three northern counties and a "ban" closing woodlands there was proclaimed June 6 by His Excellency, Governor Winant, at the insistent demand of many landowners and operators. There was a partial suspension of the closure on June 8 which was entirely suspended on June 13. During the following month of July, a serious dry period occurred in southern New Hampshire during which many fires occurred, including one in Marlboro which threatened Mount Monadnock and burned 275 acres before being brought under control. Woodlands were closed in the seven central and southern counties from the 26th to the 28th.

Fires of the Fiscal Years 1933 and 1934

A review of results obtained during the biennial period indicates that in spite of fire occurrence 27% greater than the average of the previous 23 years for which records are available, area burned was 43% less than average and damage was 52% less than normal. The average fire of the fiscal year 1933 burned 13.8 acres, caused damage of \$102.44 and cost \$42.77 to extinguish. In 1934, each average fire burned 7.9 acres, caused damage of \$27.14 and cost \$25.91. Altogether, New Hampshire woodlands suffered less than usual from the inroads of fire.

Agencies causing fires have changed very little, in general, but railroad fires have been decidedly less numerous these

past two years due, no doubt, to curtailed train operation in general and somewhat to the substitution of Diesel oil power for steam on certain branch line runs. Careless smokers are by far in the van of forest enemies, a sorry role held by this group for many years. Brush burning carelessly done is the second worst cause. No great progress in fire control can be achieved if these two agencies are not curbed. Brush burners can be reached and some control of the problem is being effected. Bills of expenses incurred fighting such fires were declared collectible by the towns from the persons who caused fires in 119 cases. Smokers, however, are difficult to apprehend. Some states prohibit smoking in the woods at certain times and other jurisdictions require persons entering woodlands to obtain what are called "circulation" permits. Smokers are so numerous, however, that such regulations are difficult, if not impossible, to administer adequately and only broad educational policies seem left as methods of control. Not a few efforts have been made to bring about the enclosure of brief fire warnings in packaged smoking materials but tobacco companies have been slow to respond to such appeals and the character of the action taken, when anything has been done, has been local, sporadic or otherwise unenthusiastic.

The following tables give summaries of fire occurrence, causes, area burned and other statistics. Readers will be interested to learn that for the fourth consecutive year, fires have been kept within average areas much lower than the twenty-five year record. This is probably the best measure of the successes being achieved yearly by the forest fire service.

NUMBER OF FIRES BY MONTHS

(Exclusive of Railroad Fires)

FISCAL YEAR Ending June 30, 1933		FISCAL YEAR Ending June 30, 1934	
July, 1932	61	July, 1933	59
August, 1932	57	August, 1933	21
September, 1932	47	September, 1933	0
October, 1932	10	October, 1933	8
November, 1932	8	November, 1933	8
December, 1932	19	December, 1933	0

(Continued on Page 98)

NUMBER OF FIRES BY MONTHS

(Continued from Page 97)

January, 1933	2	January, 1934	0
February, 1933	0	February, 1934	0
March, 1933	3	March, 1934	1
April, 1933	67	April, 1934	121
May, 1933	213	May, 1934	113
June, 1933	55	June, 1934	39
Totals	542	Totals	370

FOREST FIRE RECORD FOR TWENTY-FIVE YEARS

(Exclusive of Railroad Fires)

Year	No. Fires	Area Burned	Average Area Burned Per Fire	Damage	Average Damage Per Fire
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	8,093	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
23 years	8,246	208,473A.		\$1,578,943.00	
1933	542	7,485	13.8	55,524.00	102.44
1934	370	2,920	7.9	10,043.00	27.14
25 years	9,158	218,878A.		\$1,644,510.44	

SUMMARY OF AVERAGES

Average	23 Years	1933	1934	25 Years
Fires Per Year	359	542	370	366
Area Per Year	9,064	7,485	2,920	8,755
Damage Per Year	\$68,649.70	\$55,524.00	\$10,043.00	\$65,779.40
Area Per Fire	25.3	13.8	7.9	23.9
Damage Per Fire	\$191.48	\$102.44	\$27.14	\$179.57

FIRE RECORD FOR FISCAL YEARS 1933 AND 1934
(Exclusive of Railroad Fires)

County	Fires No.	Total Acres Burned	Average Acres per Fire in Acres	Total Damage	Average Damage Per Fire	Total Cost of Fighting	Average Cost of Fighting
Belknap	20	142	7.1	\$243.00	\$12.15	\$549.58	\$27.48
	1933						
	1934	1,000	23.3	2,862.00	78.73	3,750.42	125.01
Carroll	37	414	11.1	856.00	17.73	731.11	19.79
	1933						
	1934	182	7	622.00	23.92	740.23	28.47
Cheshire	53	221	4.1	853.00	16.09	886.18	16.91
	1933						
	1934	211	6.8	786.00	25.35	1,173.49	38.05
Coos	32	216	6.8	876.00	27.36	1,080.29	33.76
	1933						
	1934	205	6.4	714.00	22.31	889.54	27.80
Grafton	33	248	7.5	1,569.00	47.54	719.56	21.81
	1933						
	1934	82	2.5	438.00	13.69	655.21	20.48
Hillsborough	130	2,393	18.4	32,695.00	251.50	3,839.77	29.54
	1933						
	1934	80	3.2	1,432.00	17.90	788.52	9.86
Merrimack	87	2,629	30.2	8,017.00	92.15	6,003.13	69.00
	1933						
	1934	41	9.4	1,394.00	34.00	665.69	16.24
Rockingham	101	870	8.6	9,321.00	90.30	7,627.85	75.52
	1933						
	1934	66	357	1,440.00	21.82	509.27	7.72
Strafford	30	143	4.4	579.00	19.30	958.86	31.96
	1933						
	1934	15	9.1	644.00	42.93	165.97	11.07
Sullivan	19	209	11	915.00	48.15	773.40	40.71
	1933						
	1934	17	5.8	211.00	12.41	242.27	14.25
State Totals	542	7,485	13.8	\$55,524.00	\$102.44	\$23,179.73	\$42.77
State Totals	570	2,920	7.9	\$10,043.00	\$27.14	\$9,586.61	\$25.91

RAILROAD FIRE RECORD FOR FISCAL YEARS 1933 AND 1934

<i>Year</i>	<i>No. Fires</i>	<i>Total Area Burned</i>	<i>Average Area Per Fire</i>	<i>Total Damage</i>	<i>Average Damage Per Fire</i>
1933	88	459	5.2	\$3,003.00	\$34.13
1934	34	104	2.9	520.00	\$14.86

TOTAL NUMBER OF FOREST FIRES, AREA AND DAMAGE
BY CAUSES

For Fiscal Years 1933 and 1934

<i>Causes</i>	<i>Percent Total Number of Fires</i>	<i>Percent Total Area Burned</i>	<i>Percent Total Damage Causes</i>
Railroads	11.8	5.1	5.1
Smokers	46.2	42.6	67.7
Burning brush	14.8	7.4	2.7
Miscellaneous	8.8	2.9	2.8
Lumbering	1.1	.7	1.6
Incendiary	3.6	16.6	13.4
Lightning	3.1	.8	1.0
Camp fires	3.4	2.1	2.3
Unknown	7.2	21.8	3.4
Totals	100.0	100.0	100.0

COMBINED FOREST FIRE RECORD
FOR FISCAL YEARS 1933 AND 1934

All agencies reporting

<i>Year</i>	<i>Town</i>	<i>Railroad</i>	<i>White Mountain National Forest</i>	<i>Total</i>
NUMBER OF FIRES				
1933	542	88	5	635
1934	370	34	8	412
Total	912	122	13	1,047
AREA BURNED				
1933	7,485	459	4	7,948
1934	2,920	104	24	3,048
Total	10,405	563	28	10,996
DAMAGE				
1933	\$55,524.00	\$3,003.00	0.00	\$58,527.00
1934	10,043.00	520.00	\$17.00	10,580.00
Total	\$65,567.00	\$3,523.00	\$17.00	\$69,107.00

Portable Saw Mills

The operation of portable saw mills, at one time a serious fire hazard, is regulated by laws designed to prevent forest fires and the annual registration of all portable mills as well as permits to operate on each new setting are required. Steam mills must be properly equipped with spark arresters and slash must be removed a distance of one hundred feet from the mills. Fires caused by the operation of mills are rare nowadays as compared with the time when steam mills were the rule and the tractor or gasoline unit for power were practically unknown.

As a result of the registration of mills each year, operation statistics of some interest have been compiled. The following table is a ten-year record:

Year	Total No. Mills Registered	Power Used		Total Number of Permits	Number of Permits	
		Steam	Gas		Steam	Gasoline
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	278	82	191
1932	125	51	74	175	47	128
1933	141	69	72	298	106	192
1934	174	75	99	343	95	248

*Law in effect from July 1, 1925.

Conclusion

Further developments in fire control technique seem to lie in the direction of increased efforts to prevent fires, especially those starting from careless smoking. Any appreciable advance in this respect will have a great influence on the whole fire situation.

In the field of suppression, the ever increasing use of water by means of light but efficient portable pumps seems destined to continue and the development of additional water supplies is a collateral activity which will be given an important place in future programs.

Weather conditions experienced during fire seasons affect the occurrence and behavior of fires as does, perhaps, no

other single factor. For some years, important studies in this field have been carried out and scientific knowledge of this uncontrollable fire factor has increased, all with a view to the provision of reliable means of forecasting weather in terms of relative fire danger. We may hope for even more valuable discoveries as time goes on.

Regulatory laws are quite adequate in New Hampshire and their administration presents no serious problem.

LOOKOUT STATIONS



WITH the addition of a new fire tower on Stratham Hill, in 1931, the total number of mountain lookout stations supervised by the Department was increased to 28. During the winter of 1933-34, a fire station located on Mount Carrigain, in Livermore, was turned over to the federal forest service since this lookout covered, for the most part, lands of the White Mountain National Forest. Thus the number of state-owned lookouts was reduced to 27, all but one of which are in continuous operation during the fire season. A new tower was completed on Great Hill, in Tamworth, during 1934, by a unit of the Civilian Conservation Corps and it is anticipated that this new station will be opened next Spring.

Through an examination of weekly records received from the lookout watchmen, it is apparent that these men were thoroughly alert and rendered worth while service. During the two fire seasons covered by this report 1,904 fires were reported to the proper authorities and an additional 5,620 smokes discovered. The large number of "*smokes discovered*," but not reported, were made up of instances of which the lookout men had knowledge, such as fires kindled under permit, portable mill operations, or those not appearing to be located in dangerous places and thus not requiring special attention.

As in the past, the Department continued to co-operate with the forest fire services of the States of Massachusetts, Maine and Vermont through stations located adjacent to the

boundaries of these states. The Federal Forest Service, through its stations, located within the National Forest, co-operates closely with the State Forest service.

The mountain lookout stations appear to be increasing in popularity with the general public, especially among the summer population. The registers at these stations reported the fact that visitors come from practically every state in the Union, and many from foreign nations as well. In the following tabulation will be found the number of visitors registering at each station and in addition, the fires and smokes reported by the watchman. The latter figures indicate the sections of the state where the greatest fire hazard is ever present.

FIRE LOOKOUT STATION STATISTICS

Name of Station	Fires Reported		Smokes Discovered		Visitors Registered	
	1933	1934	1933	1934	1933	1934
Agassiz	3	4	4	4	*12,000	*12,000
Belknap	9	14	198	27	2,195	3,102
Black Mt.	23	26	82	121	678	690
Blue Job	39	36	151	99	1,255	1,142
Cabot	23	16	43	62	191	214
Cardigan	42	94	100	268	2,729	2,900
Crotched	42	103	101	326	1,869	2,210
Croydon	19	48	64	77	259	412
Deer	11	12	30	12	148	134
Federal Hill	34	37	62	70	702	1,107
Green Mt.	14	20	52	69	979	1,192
Hyland Hill	9	40	53	129	243	700
Jeremy Hill	89	122	179	327	2,378	2,479
Kearsarge	33	41	87	146	4,412	5,973
Magalloway	40	2	54	14	41	31
Milan Hill	34	27	80	96	1,146	1,497
Monadnock	21	34	41	57	7,161	10,867
Oak Hill	14	20	25	26	491	600
Pawtuckaway	66	107	232	253	2,516	1,444
Pitcher	11	19	16	25	982	1,465
Red Hill	16	2	19	5	2,328	2,804
Rock Rimon	55	90	290	354	761	891
Signal	3	3	23	5	56	60
Stinson	15	8	61	50	670	1,032
Stratham Hill	61	102	287	384	4,492	6,142
Uncanoonuc	54	97	141	139	3,171	3,336
Totals	780	1,124	2,475	3,145	53,847	64,424

*Estimated.

Improvements and New Construction—1933

In the interests of continued efficiency in the forest fire service it has always been the policy of the Department to repair, or improve any telephone lines, and watchman's cabins on Lookout Stations. It may not be appreciated by

the general public, but the wear and tear on the lines of communication up high mountains, or the quick disintegration of shelters in those regions, is more rapid than would be supposed. Without continuous communication with the world below, the lookout watchman would be worthless, and unless given decent living quarters, it would be difficult to maintain experienced men or their morale.



New standard type of Lookout Watchman's cabin erected on Mt. Magalloway.

During the season of 1933 the lookout service was further improved by the building of four miles of tree and pole telephone lines, and relaying several miles of parallel-pair wire on the ground. The following resume will indicate the type of repairs, or new construction, on the several stations.

Deer Mountain—This station is one of the most remote in the state, being located slightly northeast of Second Connecticut Lake, in the town of Pittsburg. Years ago, the tower was built of spruce poles, secured in the immediate vicinity. Continued inroads by climatic conditions had rendered this tower unsafe, not only for the watchman, but the general public as well. Before the winter had broken up, the necessary steel for a new tower had been hauled by sled to a point fairly near the summit. As soon as warm weather made its appearance, a steel tower was built as well as a modern two-

room cabin to house the watchman. During the summer the tower was given a coat of aluminum paint, and two miles of pole and tree-line telephone constructed.

Magalloway Mountain—Just 10 miles southwest, air-line, also in Pittsburg, below First Connecticut Lake, is situated the second most northerly of all fire lookout stations. It is the most inaccessible station, as is indicated by the number of visitors which climbed to its summit during 1933-34; the number being the smallest of all lookout stations. A new standard two-room cabin was built within 50 feet of the tower, and replaces the old log camp situated one mile down the steep mountain side. Both tower and cabin were given a coat of paint during this season.

Monadnock Mountain—In southwestern New Hampshire no mountain peak is more popular with summer or winter visitors than Monadnock. In registered attendance, it stands first of all lookouts in the state. It also commands a region where the population is great, and the fire hazard proportionate. A new watchman's cabin was built just off the trail which leads from the "*Half Way*" to the summit on the Troy side. The present cabin is now located within a few hundred feet of the observation tower, as against the old structure more than a mile down the mountain. The lumber, which went into its construction, was packed up from East Jaffrey by crews of the 118th Company, Civilian Conservation Corps. The lookout shelter on this mountain was also given a coat of aluminum paint.

Pitcher Mountain—Just east of the village of Bennington lies the lookout station on Pitcher Mountain. When this station was first opened, some years back, a rather rough, one-room cabin was erected. During 1933, a standard, two-room structure was built, in keeping with the more modern ones on other stations. The ladder, leading to the tower, was replaced with wooden steps, so as to make the ascent more easy to the general public. Both cabin and steel tower were given a new coat of paint.

Green Mountain—This station, located in the town of Freedom, has long been a favorite for summer climbers in

the Ossipee Lake region. In past years much has been done to make this isolated peak more accessible to the general public, and to increase its worth as a fire station covering not only New Hampshire, but certain portions of the State of Maine as well. In the summer of 1933, two miles of telephone pole line were constructed up this mountain; a portion of this project being carried on by a crew from the 117th Company, of the Civilian Conservation Corps, located at Tamworth.

During 1933, in addition to improvements mentioned heretofore, towers and cabins situated on Blue Job, Cabot, Croydon, Hyland Hill, and Kearsarge Mountains were given a coat of enduring paint.

Improvements and New Construction—1934

During the past year improvements and construction, on lookout stations have been greatly increased. Two new towers were erected; four new watchmen's cabins built, and more than 19 miles of pole telephone lines and repairs made, including several towers and cabins. These new improvements, or repairs, are indicated as follows:

Signal Mountain—This station, located but a few miles southwest of Errol, had long been in need of modern construction. Consequently, during 1934 a 37-foot steel tower was erected to supplant the old, decayed structure, and the antiquated log cabin was demolished, and a standard two-room cabin built in its place. A wood and tool room was also added to the cabin for the convenience of the watchman, whose mountain headquarters are a long and distant trek from civilization.

New Lookout Stations

Great Hill, Tamworth—In 1932, the late Augustus Hemenway of Boston, deeded to the Forestry Department his summer estate of nearly 2,000 acres. Early in June, 1933, a camp of the Civilian Conservation Corps was located on the northeastern boundary of this state tract and has been instrumental in the erection of a new fire tower on Great

Hill; a summit entirely within this reservation, and obtaining a wide-spread view of the Tamworth and Ossipee Valleys. The new fire station is 35 feet in height, and at its base is a room, finished in log-siding, which is an entirely new innovation in construction so far as lookout stations are concerned. It is expected that early in 1935 this new station will be operated in the interests of fire prevention.

Several of the watchman's cabins had long been in a dilapidated condition. On Mounts Belknap, Cabot and Stinson standard, two-room camps were erected, together with woodsheds and facilities for the storage of tools and other station equipment. On Blue Job, Cardigan, Croydon, Crotched, Federal Hill, Hyland Hill, Kearsarge, Oak Hill, Red Hill and Rock Rimmon, cabin roofs and walls were covered with wood shingles, replacing unserviceable roofing paper. Given proper stain, this covering will be of service for many years.

An opportunity presented itself, through assistance from CCC camps, to bring about a marked improvement in the lookout telephone service by constructing several pole lines with No. 12 wire circuits. The following stations were thus equipped during 1934: Mts. Cardigan and Croydon, 2 miles each; Hyland Hill and Kearsarge, $1\frac{1}{2}$ miles each; Pawtuckaway, $3\frac{1}{2}$ miles; Red Hill, $1\frac{3}{4}$ miles, and Stratham Hill, one-quarter of a mile. In addition to this work by the CCC crews, the Department's regular construction crew built similar telephone lines as follows: Belknap, Blue Job and Rock Rimmon, two miles each, and one mile on Mt. Cabot.

The equipment at the following stations has received a coat of stain and paint during the past season: Belknap, Cardigan, Crotched, Federal Hill, Oak Hill, Red Hill, Rock Rimmon and Signal.

Water Supply—More attention must be paid to securing an adequate water supply for use of the watchmen and the thousands of visitors that annually ascend to the lookout stations. During 1934 a new well, 12 feet deep, was blasted out of the ledge on the summit of Belknap, and furnished all the water needed. Similarly, on Red Hill, in a nearly solid ledge, a 16-foot well was constructed. The satisfaction, as

manifested by the watchmen and visitors, appears to warrant similar construction at other stations.

Other future plans will be furnishing lightning protection by equipping the cabins with proper lightning rods. During the past two years there have been at least three cases when lightning nearly caused serious injury to watchmen.

The material for a new steel tower is now being drawn to the top of Magalloway Mountain. The tower will be erected in the early spring, and with this completed, the last wooden lookout tower will be removed. Further improvements another season will consist in the erection on several of the stations of small garages for the watchmen's cars, as many of the stations practically require the watchman to have a car in order to transport the necessary supplies. In several instances when watchmen's cars have been left without cover, and unprotected, tires, tools and other equipment have been stolen.

There is also the possibility of establishing a new station on Moose Mountain, in Lyne, on a tract recently acquired by the state. This will require at least a 50-foot tower, cabin and about two miles of telephone line.

During the past two seasons more than 70 men have been employed from time to time on lookout station construction.



The new dam on Stirrup Iron Brook will flood an area of about 3 acres.

NURSERY AND REFORESTATION



THE service of distributing trees from the State Forest Nursery has varied only slightly in amounts shipped during the past three biennial periods. There is, however, a very noticeable change in volume from the individual or private planting orders to the public plantings on state and municipal areas. The private planter is not affected by lack of interest in improving his cheap and unproductive land, but rather by uncertain and changing conditions caused by the depression, a factor which is influencing all lines of business today when long time investments must be made. Increased orders from towns resulted principally from relief projects being carried on and a type of work which will probably need many more trees in the next few years.

These increased activities together with the greater demand for trees for state land planting took all the stock that the nursery cared to move during the spring of 1934, a situation which has not been enjoyed since the spring of 1928.

The white grub, which is one of the most destructive forest nursery pests, did considerable damage to seedling stock during the summers of 1933 and 1934. Grub work is present in most nurseries as it has been in the state nursery, doing individual or negligible amounts of damage. The injury to the trees is caused by the grub feeding on the tender bark of the roots, from one to six inches below the surface. The most practical control is to apply and mix poison into the soil so that it will be taken into the grub's system along with the roots and soil. Previous to this the nursery has had only one serious attack. Experiments since then to control the grub with various amounts of crude white arsenic per acre have shown that not less than 200 pounds per acre is sufficient. It was hoped that smaller amounts would be sufficient for grub control as too much arsenic in the soil will burn the tender roots of conifer seedlings and transplants. The areas where serious damage resulted were those that had been treated with less than 200 pounds of arsenic per acre.

Boys' and girls' educational clubs in New Hampshire which include 4-H clubs, Agricultural High Schools, Juvenile Granges and Boy Scouts were given free trees for planting on their own land as they have been since the spring of 1929, 500 trees being given to club members from nine to sixteen years of age and 1,000 trees to members from 16 to 21 years. A total of 595,627 trees were planted by all clubs for the biennial period.

A 4-H club field day was held at the nursery during the springs of 1933 and 1934 in connection with the distribution of trees to club members. Parties of boys and girls with their lunch baskets and frequently accompanied by their parents came in the morning prepared to spend the day at the nursery. Judging contests were held in the surrounding woodland covering different phases of forest improvement work. The different nursery operations of growing forest planting stock and also methods of heeling in and planting trees in the field were demonstrated by nursery crews. The rest of the day was spent playing games and receiving their allotment of trees.

The Nursery co-operated with the State Highway Department by giving trees from its forest planting stock for roadside planting and for further development in the nursery to larger sizes for the same use. About two acres of the nursery area was used for this purpose and for carrying stock purchased from commercial nurseries. The trees and shrubs that come from commercial nurseries are either stock that is purchased in small sizes for developing to save expense or odd lots left from planting where larger amounts of stock were purchased than immediately needed for the same reason. The trees donated by the forest nursery consisted of a few hundred conifer transplants of eight different species grown for reforestation work.

Very little permanent improvement work has been done with the exception of the dam built on Stirrup Iron Brook for impounding a water supply for the nursery. This was made a relief project and is reported under Forestry Relief Projects.

One 400 foot line of sprinkling pipe with an oscillator for turning the line was purchased. Three of the house chimneys were built over as the mortar was falling out and the chimneys were unsafe.

Trees for reforestation planting were given to 19 towns and cities for planting on municipal areas, 359,540 trees were given for this work while the towns and number of trees received by each is shown in the following summary: Charlestown, 3,000; Bath, 1,000; Portsmouth, 17,000; Durham, 4,000; Wilton, 26,000; Manchester, 148,000; Hanover, 115,000; Dover, 2,000; Jaffrey, 2,000; Whitefield, 150; Claremont, 500; Franklin, 12,600; Newfields, 250; Deerfield, 1,000; Greenland, 1,000; Stratham, 1,000; South Hampton, 6,000; Milford, 40; Epsom, 1,000.

The following table shows the value of stock distributed by years and the agency using same.

VALUE OF NURSERY STOCK PRODUCED

Year Ending June 30, 1933

Trees sold to private planters	\$1,245.52
Trees given to 4-H and other juvenile clubs	1,727.66
Trees given to towns	751.70
Trees used on State lands	1,918.83
	<hr/>
	\$5,643.71

Year Ending June 30, 1934

Trees sold to private planters	\$908.91
Trees given to 4-H and other juvenile clubs....	1,226.41
Trees given to towns	1,431.82
Trees used on State lands	4,198.69
	<hr/>
	\$7,765.83

NURSERY OUTPUT: FALL 1932—SPRING 1933

Age of Stock	White Pine	Red Pine	White Spruce	Red Spruce	Larch	Norway Spruce	Douglas Fir	Scotch Pine	Carolina Poplar	White Ash	Total
6 yr. transplants	2,450	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,450
5 yr. transplants	26,080	.....	61,461	.....	.....	.....	.....	.....	.....	.....	128,581
4 yr. transplants	.....	104,201	43,560	3,700	.....	675	15,300	12,250	.....	.....	265,497
3 yr. root pruned seedlings	318,317	55,620	98,725	700	3,075	6,475	8,300	31,475	500	.....	523,187
2 yr. seedlings	.....	.....	.....	50	5,175	.....	.....	1,250	.....	450	6,925
Totals	432,718	200,861	203,686	4,450	8,250	7,150	23,600	44,975	500	450	926,640

NURSERY OUTPUT: FALL 1933—SPRING 1934

Age of Stock	White Pine	Red Pine	White Spruce	Red Spruce	Norway Spruce	Douglas Fir	Scotch Pine	White Ash	Balsam Fir	Black Walnut	Total
5 yr. transplants	4,960	59,435	46,810	7,750	.....	1,500	7,500	.....	.....	.....	127,955
4 yr. transplants	.....	182,300	9,640	1,400	300	2,850	1,000	.....	1,300	.....	217,840
3 yr. root pruned seedlings	270,120	257,420	291,000	27,550	26,350	16,600	64,300	500	300	.....	954,140
2 yr. seedlings	.....	9,700	.....	.....	.....	.....	.....	.....	.....	200	9,900
Totals	294,130	508,855	347,450	36,700	26,650	20,950	72,800	500	1,600	200	1,309,855

REFORESTATION



REFORESTATION work in New Hampshire for the past two years by the private planter has continued its gradual drop which started with the beginning of the depression. However while this type of planting has grown less, large increases have taken place in connection with state and government relief projects. These projects are apparently due to continue as the acquisition of large areas of sub-marginal land by the government will need extensive planting in order that unproductive farm areas may be put to its best use.

Two more plantations of Boonville Scotch Pine were made in co-operation with the Northeastern Forest Experiment Station at New Haven. The beginning of this experiment was mentioned under Reforestation in the previous State Forestry report and while original plans only called for one acre to be planted for three consecutive years on the Casalis Reservation, 2,200 extra trees were available and they were planted on the Ponemah State Forest.

An experimental planting of 500 *Pinus Peuce* was made on the Hubbard Hill tract to determine if this species was immune to Blister Rust infection. A few years ago reports indicated that *Pinus Peuce* was not susceptible to blister rust and therefore a good substitute for white pine. This tree is a native of the Balkan States and is sometimes called the Macedonian pine. Seed was planted and trees developed in the nursery and the transplants set where ribes were known to exist. Since that time it has been reported that this species is not immune to Blister Rust. A few more of the trees remain in the nursery and they will be planted in ribes infested areas to complete the experiment.

Reforestation work on State tracts was considerably increased during the past biennial period due to relief and CCC Camp work in 1934. During 1933 the usual amounts of plantings were made with 265,375 trees being planted on

302 acres. However with CWA crews, Forestry Relief crews and five CCC Camps working on State tracts, many acres of land supporting only cheap and undesirable growth were cleared and made available for planting. This, together with the clearing of sizable areas of slash by the same crews not only made more area available for planting but also furnished labor for planting. A greater part of these plantings were made by the CCC Camps which planted *512,000 trees on 557 acres. Other crews planted 165,430 trees on 201 acres, making a total for the year of 668,130 trees set on 747 acres and a grand total for the biennial period of 1,049 acres planted with 933,505 trees on 31 tracts. Red pine, white spruce, white pine and Scotch pine were the species more heavily planted in the order named.



During the past two years 2,239 acres of waste and cut-over lands were reforested.

The following table shows the detail of the planting operation on State lands for the past two years:

*Includes 9,300 trees planted previous year.

PLANTING ON STATE LAND BY TRACTS, NUMBER AND SPECIES

Tract	Acres Covered	White Pine	Red Pine	White Spruce	Red Spruce	Larch	Norway Spruce	Douglas Fir	Scotch Pine	Balsam Fir	White Ash	Black Walnut	Total
Allen	18	17,950	17,500	.....	.....	.....	.....	.....	1,000	.....	.....	.....	18,500
Annett	200	17,950	154,500	.....	.....	5,175	.....	.....	.....	.....	.....	.....	177,625
Blair	35	4,000	12,000	.....	14,000	.....	.....	.....	.....	.....	.....	.....	30,000
Blue Job	13	.....	.....	.....	.....	.....	.....	5,000	3,000	.....	.....	.....	8,000
Cardigan Mt.	24	.....	1,500	18,700	2,750	.....	.....	.....	.....	500	450	.....	23,900
Casalis	31	24,000	.....	.....	.....	.....	.....	.....	2,200	.....	.....	.....	26,200
Cathedral Ledge	10	.....	8,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,000
Clough	14	.....	14,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,000
Connecticut River	10	6,000	.....	.....	.....	.....	4,000	.....	.....	.....	.....	.....	10,000
Conway Common Lands	15	.....	.....	5,000	.....	.....	5,000	.....	.....	.....	.....	.....	10,000
Dodge Brook	16	2,650	5,100	3,825	.....	.....	1,825	2,050	.....	.....	.....	.....	15,450
Fox	22	2,410	6,410	2,410	3,400	.....	400	3,500	1,400	400	500	200	21,030
Franconia Notch	10	.....	.....	4,000	.....	.....	.....	.....	.....	.....	.....	.....	4,000
Haven	1	.....	.....	.....	500	.....	.....	.....	.....	.....	.....	.....	500
Hemenway	151	28,750	25,750	65,000	10,000	.....	10,000	5,000	.....	.....	.....	.....	145,000
Honey Brook	100	2,350	52,650	36,330	.....	.....	100	100	.....	500	.....	.....	91,530
Jeremy Hill	8	2,000	2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,000
Kearsarge Mt.	11	.....	2,500	8,050	.....	.....	.....	.....	.....	.....	.....	.....	10,550
Mass Yard	21	.....	.....	.....	.....	.....	.....	.....	10,500	.....	.....	.....	10,500
Merrimack River	1	200	200	200	200	.....	200	.....	200	200	.....	.....	1,400
Monadnock	16	.....	.....	9,000	1,650	.....	.....	.....	.....	.....	.....	.....	10,650
Nursery	4	.....	1,000	1,000	.....	.....	.....	.....	500	.....	.....	.....	2,500
Pawtuckaway Mt.	100	3,150	34,850	42,175	2,125	.....	3,175	1,000	.....	.....	.....	.....	86,475
Pillsbury	25	.....	12,550	6,845	.....	.....	1,075	950	.....	.....	.....	.....	21,420
Ponemah	37	.....	3,500	.....	.....	.....	.....	.....	42,600	.....	.....	.....	46,100
Powow River	22	.....	18,000	.....	2,000	.....	.....	.....	2,000	.....	.....	.....	22,000
Scribner-Fellows	2	1,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Sentinel Mountain	12	.....	.....	8,000	.....	.....	.....	.....	.....	.....	.....	.....	12,000
Soucook River	40	500	1,500	.....	.....	.....	4,000	.....	25,300	.....	.....	.....	27,300
Stockdale	10	.....	10,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,000
Woodman	70	2,000	16,000	38,000	.....	.....	.....	7,875	.....	.....	.....	.....	63,875
Totals	1,049	96,960	399,510	249,535	36,625	5,175	29,775	25,475	88,700	1,600	950	200	933,505

THE CIVILIAN CONSERVATION CORPS

Camp Pillsbury—S-51 122nd Company

Croydon Lookout Station—The old telephone pole line on Croydon Peak being in a poor condition, a shorter line of two miles was constructed during 1934. Starting at the East Pass Gate, it follows the road for $1\frac{1}{2}$ miles to the Jacob's Place, and from there turns and strikes direct to the summit of the mountain.

Dodge Brook—An old road ten feet in width and leading partly around this reservation was repaired and will be used in fire protection and general service work around the tract.

Nearly the entire tract was covered by various cultural operations, of which thinning comprised 21 acres, improvement cutting 33 acres, weeding 52 acres and clear cutting two acres. A natural pine stand was thinned and pruned selectively. Fifty thousand four hundred and fifty trees were planted. A boundary survey of 6.24 miles and type-mapping covering 215 acres were finished.

Fox—A boundary survey of 8.94 miles was made in the fall of 1933 and about four miles of old wood road brushed out. In August, 1934, forest improvement work was done on the East tract and 42.5 acres covered by thinnings and selection cuttings. One hundred fifty cords of fuel wood, 14 cords of poplar and 7,761 board feet of saw logs were obtained. Incidental to this work 4,650 feet of wood road was brushed out. Eighteen hundred trees were planted in the fall of 1934 on experimental plots; experimental seed-spotting and other investigative work was conducted.

Honey Brook State Forest—Starting from the Marlow road and extending for $1\frac{1}{2}$ miles through the reservation to the Gumb place, a ten-foot truck trail was constructed. This will be used as a general service road and also for fire prevention.

A large part of this forest was covered by stand improvement work. During the fall and winter of 1933-1934 the cutting was confined to areas near the highway and 4.9 miles of roadside were cleaned up, thinned and slash burned. Farther back where it would be less unsightly and less of a fire hazard, slash was scattered and left as protection to the exposed ground. About 221 acres were covered by improvement cuttings, yielding 98 cords of fuelwood and five acres were thinned. Some girdling was done where the damage caused by felling the large trees would have been greater than their value. Plantations and young natural growth were weeded of gray birch and other interfering brush on 14 acres. Selective pruning was done on three acres of plantation. Seventy-two thousand trees, chiefly red pine and Norway spruce were planted on old fields in the spring of 1934. A boundary survey totaling 16.82 miles and a truck trail survey of 2.32 miles and type-mapping of 1,036 acres (813 in 1933-34) were completed.

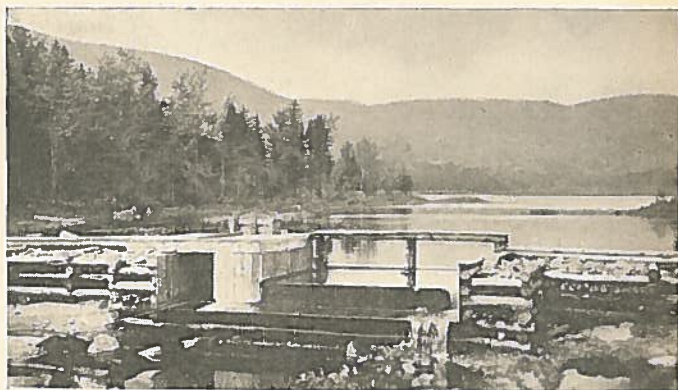
Pillsbury—One of the most outstanding types of construction made on this reservation was a wooden observation tower 30 feet in height. This is to be used for fire detection by the local ranger and for game observation by an agent of the U. S. Bureau of Biological Survey. A new garage and porch was added to the caretaker's house. General repairs were made to the barn and other buildings. Painting inside the boarding house as well as the staining of new buildings without was also completed. Along the road leading to Washington just a short distance below the Butterfield dam an open shelter was built for picnic parties, the spring cleaned out and put in good usable condition.

A telephone line $4\frac{1}{4}$ miles long was constructed from a point within the reservation to Goshen Four Corners.

The main road leading into the reservation was graveled for its entire length and new drainage facilities were installed at needed points. A truck trail was built from a point near the caretaker's cabin to North Pond. In addition, an old town road to Fletcher Pond was rebuilt and will make the forest more accessible and assist in fire prevention. Back

of the boarding house an old well was cleaned out and a substantial cement covering built. Seven hundred feet of copper tubing was laid so as to provide an adequate supply of water for the house.

During 1933 a new log dam 140 feet in length was built at North Pond. At a point further east a low area necessitated construction of a log dyke 120 feet in length and



New Dam at North Pond built by the 122nd Co. CCC.

about four feet in height. These two operations will result in the restoration of an attractive sheet of water of about 85 acres and aside from its recreational and fishing facilities will be very valuable in maintaining a more constant flowage of the Ashuelot River. Along the Washington highway, but within the Reservation, an old rock dam originally built about 150 years ago is being restored. Specifications call for the restoration of this structure as near to the lines of the original one as is possible, the only modern feature being a cement spillway. When the gates are closed the flowage will cover about 70 acres and will back into the waters of May Pond. This will create an unusually large and attractive recreational center and when the Goshen-Washington Highway is completed it will undoubtedly prove very popular to such persons desiring vacations in a more remote spot. Among minor repairs made to dams on the reservation is

included the repairing of a gateway and certain portions of a dam at Mill Pond. Improvement was made to the road leading into the Ranger Station and a new road constructed to North Pond. Accessibility was an important condition for stand improvement work.

In the fall of 1933 the roadside near the entrance to the Reservation was improved by thinning out dead, dying and diseased trees. An area of over-mature hardwood was also cut for fuel wood. Thickets of middle aged balsam fir were thinned and aphid-infested trees burned. An old field type also near the highway was released by removal of gray birch. A small area between North and Mill Ponds and along the shores of each pond was treated similarly. In 1934 a considerable area was covered by various operations. Cordwood was obtained where possible. Defective hardwoods were girdled where they were interfering with promising young



The reconstruction of a dam first built 150 years ago.

growth of spruce and fir, and young hardwood sprouts weeded out. Slash was burned when near the highway where it might form a fire hazard or have an objectionable appearance. Several miles of truck and foot trail were built to obtain access to the areas treated. Some small fields were planted in the spring of 1934. Other accomplishments included a survey of the boundaries and a type map and timber

estimate of the reservation. Up to January 1, 1935 the following had been done: Improvement cutting 239.5 acres; weeding, 139 acres; girdling, 97 acres; roadside improvement, one mile; planting 21,000 trees on 25 acres. One hundred seventy-four cords were cut for use as fuel at the camp. The boundary survey of 25.9 miles was completed and 4.15 miles of road were surveyed. Eight water holes were made for fire protection and 106.5 acres of shore line cleaned up.

Sunapee Town Forest—Inflammable and unsightly slash along the highway was cleaned up and burned and 22.5 acres were thinned, removing 12.5 cords of fuel wood.

Water Holes—Eleven water holes have been completed for two towns as follows: Seven in Goshen and four in Lempster.

Boundary Surveys—Boundary surveys totaling 8.15 miles were run out on the Hubbard Hill tract, and 3.06 miles on the Connecticut River property, both areas being in Charlestown. Type maps of 678 and 213 acres respectively were also made of these reservations. A portion of the town line between Lempster and Washington totaling 2.41 miles was surveyed.

Blister Rust Control—In the towns of Acworth, Goshen, Lempster, Marlow, Sunapee and Unity a total of 8,837 acres were examined and 910,746 currant and gooseberry bushes located and destroyed.

Camp Pawtuckaway—S-52 123rd Company

Belknap Mountain—A new road 1.3 miles long in Gilford was started by State employment funds. The CCC crew continued this project and have gravel surfaced for about two-thirds of the way, put in cement culverts, finished the drilling and blasting, sloped back part of the banks, as well as doing a lot of roadside clearing, etc.

The lumber for the new watchman's cabin was all packed to the top of the mountain as well as the poles for the new telephone line to the Lookout Station.

Deerfield Town Park (Pleasant Pond)—This Park contains seven acres of land on which there are two acres of hardwood grove next to the lake. Bushes and dead trees have been cut and burned. The grove has been graded. A new circular roadway has been built in the open area to be used for a parking space.

Endicott Rock (The Weirs)—This area was recently acquired by the State from the City of Laconia and contains about two acres of land which includes the Endicott Rock.

The steel pier out to the Rock, which had been damaged by ice, was repaired and six new cement electric light posts erected. On top of these posts are large electric globes. The electricity supply is derived from a ground cable which was put in from the end of the pier to the state highway. Four hundred and fifty feet of new woven wire fence was built along the railroad track. The wire was furnished by the B. & M. R. R.

Opechee Park (Laconia)—A side-camp accommodating 25 men and two Forestry foremen, was started November 6, 1933 to do the work in this Park. A bathing beach 480 feet long has been completed on the east side of the point of land that extends into Opechee Lake and contains about two and a half acres, all of which has been cleared and graded. A bath house has been erected, the dimensions of which are 48'x14'. A toilet and 1,600 feet of wood fence has been built. All the trees were pruned and the underbrush cut.

Pawtuckaway—Since this camp started on June 12, 1933, there has been rebuilt and gravel surfaced three miles of the old town road leading from the Deerfield-Raymond state highway, over Maloon Hill to the State land this side of the Goodrich Place, then continued for $2\frac{1}{2}$ miles through the State land by Ranger's Cabin, around the east end of Middle Mountain, by Round Pond Corner and the Chase Place, back to the road that takes one out to the State highway.

A parking space has been completed at the head of Boulder Trail and a tenth of a mile of road to the old town road. This parking area will accommodate about sixty cars.

Beginning at Round Pond Corner, there has been about three-quarters of a mile of rock foundation, sub-fill, and culverts put down through Boulder Trail to just beyond the



Crew from the 123rd Co. CCC constructing water-hole in Fremont.

brook below Spring, then turns south and continues part way down toward Round Pond. Work will be resumed on this project next spring and eventually will be completed out to the Nottingham Town Road, a distance of about $1\frac{1}{2}$ miles.

The Ranger's cabin at the foot of South Mountain has been shingled. The foot trail from there up to the Lookout Station has been rebuilt.

On the east end of Middle Mountain, there has been completed a ski trail, 1,800 feet, down to Round Pond Corner, and then continues down the old Round Pond Road toward the famous old Ballard Rock, a boulder which is probably one of the most interesting in this part of the State. The foot trail from there up by Rocky Ridge has been improved, which takes one by the Pawtuckaway Boulders, thence up to the Caves, Devil's Den, and Dead Pond.

Three miles of metallic telephone line have been completed from the New England line to Ranger's Cabin, and a new insulated line 1,200 feet in length continues from there to the Lookout Station.

Roadside improvement along the entrance to the Reservation from the main highway was one of the first undertakings. Several vistas were opened up which added to the scenic value and the tree growth was improved so as to emphasize its natural appearance. Four miles of roadside were thinned and pruned for this purpose. Clearing the slash left from extensive portable mill operations served the dual purpose of hazard reduction on 150 acres and furnishing cordwood. All fuel wood of any value was trimmed out and the remaining slash piled and burned. Forest improvement cuttings including fifteen acres of thinning and releasing covered 165 acres of pine and hardwoods. These cuttings and the wood salvaged from the slash area yielded seven hundred cords of wood for camp use.



Completed water-hole in Fremont. See opposite page.

Twenty-two acres were planted using white and red pine and white spruce seedlings and transplants. About six acres of pine of two to six inches in diameter were pruned to give a sixteen foot clear butt log. A boundary survey of eight and one-half miles was made and the whole reservation of 1,050 acres type-mapped.

Lookout Stations—On Red Hill, in the town of Moultonboro, a metallic telephone line $1\frac{1}{2}$ miles in length was completed. The roof to the watchman's cabin was shingled and minor repairs made to the building. One and three quarters miles of the foot trail up Red Hill was repaired.

From the New England Telephone Company's line to the lookout on Stratham Hill, 1,500 feet of new metallic line was constructed.

Webster Park (Epsom)—The park road leading from State highway toward Short Falls, 3,600 feet in length, has been gravel surfaced. Two culverts were put in. The triangular shaped piece of land in front of the schoolhouse was graded with loam and a short one-way road built back of the school building, connecting the park road with the Town road. About 1,500 feet of old road was repaired and gravelled, leading from the main road going westerly around the ball park, out to the state highway.

A new refreshment booth and two toilets were built and a flag-pole erected. The small pond was cleaned out and a part of the shore was gravelled.

On the opposite side of the Suncook River, the grove and beach were cleaned up and a new wire stock-fence, 225 feet long was built across the pasture from the river to the highway. Another fence 550 feet long was erected on the property line. All fence posts were treated with creosote and a wire back-stop erected on the ball field. All material required for this work was purchased by the town of Epsom.

Red pine three-year-old transplants in the number of 1,000 were planted throughout this property.

Woodman—Improvement cuttings on twenty-nine acres and wood salvaged from old slash gave a total of 262 cords of wood. Four acres of pine were released, and nineteen acres were planted using 18,500 red and white pine and white spruce seedlings and transplants. Fifty acres were cleared of slash which was burned in piles. One hundred and forty-one acres were type-mapped and one mile of boundary survey completed. About one-half mile of roadside was improved.

Twelve miles of boundary survey were completed on state tracts which could be reached easily. These tracts included Bear Brook, Mt. Belknap, Powow River, and Kingston Lake. Twenty-three miles of boundary survey were run on town-owned tracts in the towns of Deerfield, Danville, Newington, Northwood, Pittsfield, Stratham and Epsom. Most of these areas were type-mapped, a total of 1,741 acres being completed.

Water Holes—Two holes have been dug in Fremont, two in Raymond, one in Deerfield, and an old dam rebuilt in Epsom.

Blister Rust Control—Control work was conducted in the towns of Candia, Chichester, Deerfield, Epsom, and Nottingham, the areas protected totaling 8,247 acres, on which 614,888 currant and gooseberry bushes were destroyed.

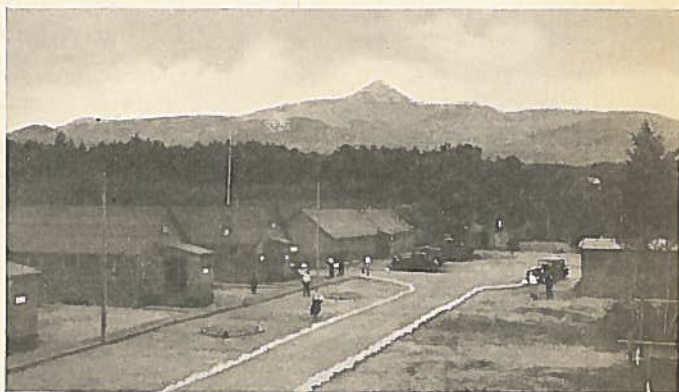
Camp Hemenway—S-53 **117th Company**

Crawford Notch—The U. S. Forest Service loaned 10 men from the Glen camp in Bartlett, N. H., during the summer, fall and winter of 1933 for work in Crawford Notch. These men were daily transported from the camp and were under State supervision. This work consisted of general improvements about the Willey Camps, camping grounds, opening a vista at the north entrance to the Notch and cutting fuel for winter use.

During the middle of October, 1933, about 20 men from the State CCC Camp at Tamworth were quartered in a side camp near the Willey House site. During the fall and winter this crew built a log bridge across the Saco river and one-quarter mile of road to the gravel slide at the base of Mt. Webster. At the end of the season several new buildings were constructed which included a new caretaker's quarters, a garage and out buildings.

Cutting vistas near the Frankenstein Cliffs yielded 50 cords of wood; improvement thinnings near camp made 60 cords for fuel and fire hazard reduction produced 15 cords

more. During the summer season of 1934 the men were engaged in keeping the Willey House premises clean, cutting grass, caring for the camp ground and work on trails. About 50 cords of fuel wood were cut and sawed for immediate use at the camp.



*Camp of 117th Co. CCC, Hemenway State Reservation.
Mt. Chocorua in distance.*

Duncan Lake—Gray birch and other weed trees were cut out of planted pines on one-half mile of roadside. Brush was cleaned out and some of the trees pruned as a fire reduction measure on three acres. The tract was surveyed and a type map made.

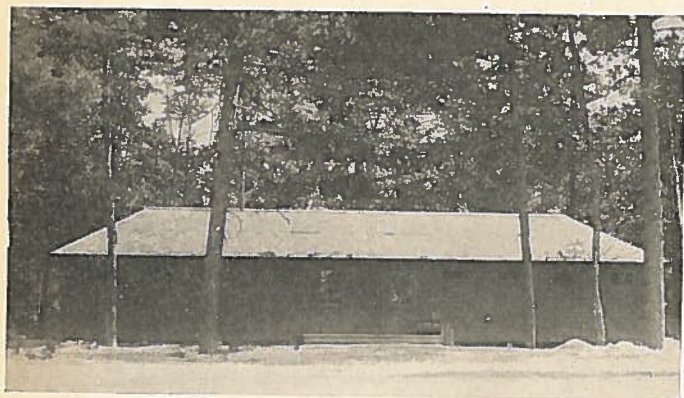
Governor Wentworth—At the Governor Wentworth reservation in Wolfeboro, a garage 20x20 feet was built and the foundation laid and work commenced on a caretaker's cottage. When completed this will consist of a three-room dwelling with a large, open fireplace in one room for the use of the public. In this room there will also be an exhibit of many antiques formerly in the Governor Wentworth Mansion.

Green Mountain—On Green Mountain a rough graded truck trail of one mile was constructed from the main highway to a parking area. The roof of the lookout watchman's cabin was shingled and the entire structure stained. One mile of telephone pole line was constructed.

Hemenway—Starting from a point on the Wonolancet Highway, an old woods road, running through the Hemenway Reservation for about $2\frac{1}{2}$ miles, was rebuilt. Old stone culverts were relaid and in some instances re-enforced cement culverts were utilized. The road was widened in many places and the whole graveled. Near the CCC Camp a truck trail of about one-half mile was built for fire protection.

A new steel lookout tower, 30 feet in height, was erected on the summit of Great Hill. The observation room at the top and a shelter on the lowest level will be finished with log siding. General repairs were made to both sets of buildings on the Reservation.

While no new dams were contemplated, the extent of repairs necessary to tighten one previously built before the



Nearly 12,000 persons used the White Lake Reservation Bath House in 1934.

State took title, were so great as to almost warrant the classification of new construction. The original structure, an earthen dam with a cement core, was badly cracked. The core was caulked tight and both sides re-enforced with rocks and gravel for a distance of 250 feet. Grass was sown on the new embankment, the spillway repaired and the adjacent foreground cleared of underbrush and made attractive as a picnic and recreational site.

Old fields and pastures were cleared of gray birch and other weed trees on 132 acres and 38 acres of slash were burned. White pine and spruce were released from overtopping hardwoods on eleven acres and old hardwoods were cut to release young sugar maple and white ash on three acres. About 1,250 cords of wood and 30,000 board feet of lumber were realized as a result of the improvement work. Fire hazard was reduced on 224 acres which includes 40 acres of roadside and 38 acres of slash. Four miles of temporary wood roads were cut to facilitate travel and removal of wood. Two hundred and one thousand white pine, red pine and spruce have been planted on 151 acres. Re-eradication of currant and gooseberry bushes was carried on during the summer of 1934 and 9,476 ribes were destroyed on 1,515 acres. Ten and one-half miles of roadsides were cleared of dead and down trees and undesirable species removed. One hundred and fifty cords of wood were salvaged. The boundary of the tract was surveyed, corners set and the lines painted. An accurate type map was completed for the entire 1,991 acres.

Huckins—One mile of roadside was improved by the removal of scrub oak and this cutting will also serve as a fire-line. Four acres of fire hazard reduction resulted. A boundary survey was completed of the entire tract and corners set.

White Lake—On the shores of White Lake, which is situated in Tamworth, an attractive bath house 14x60 feet was built during the summer of 1934. Centrally attached in the rear is an ell with modern toilet facilities. In addition to these structures a 12x20 foot garage was erected for the use of the reservation caretaker.

In order to provide the necessary water for the toilets connected with the bath house, a well was dug near that building and an electric pump equipment assures a reliable supply of water. It is planned to extend this system to the picnic and camp ground for the convenience of the many thousands who enjoy this reservation. To provide current for the electric pump, one and one-quarter miles of combined telephone and electric light line was built.

Starting at the cement highway, on Route 16, a road was constructed, running through this reservation to the dirt road leading to Tamworth. In addition, a secondary road was built leading to a camp ground and open shelters. The total of gravel surfaced roads on this property, when completed, will be about two miles.

In the rear of the bath house an oval parking space was grubbed out and partially graded. At the end of the main road leading into the beach the older parking area was enlarged and graded.

One-half mile of roadside improvement work was completed between the road and the shore of the lake, opening up new views. This work resulted in four acres of fire hazard reduction. An accurate type map was made of the area as well as a contour map on a large scale. The tract was surveyed, corners were set and the lines painted. Two bushels of red oak acorns were planted along the roads and near the buildings. Thirty cords of wood were obtained from the improvement work and from the road right-of-way.

Water Holes—Lack of an adequate supply of water at the crucial moment has often been the reason for forest or building fires becoming beyond control. The town forest fire wardens, and others, have long known of many sites where water is prevalent the year round, irrespective of seasons of drought. At many such places but a small amount of work and little expense is required to produce reservoirs containing many thousands of gallons of water. Such water supplies, augmented by portable fire pumpers, have in the short period of their existence saved several buildings.

From the Tamworth camp water-holes have been constructed in several nearby towns, as follows: Ossipee, one; Sandwich, three; Freedom four and Tamworth nine, a total of 17.

Boundary Surveys—Boundary surveys and type maps were made of the following tracts: Cathedral and White Horse Ledge, Merriman, Redstone, Conway Common, Bowditch-Runnells, Green Mountain and Wentworth.

Blister Rust Control—White pine blister rust control was carried on in Albany, Effingham, Madison, Moultonboro, Ossipee, Sandwich and Tamworth, there being 11,556 acres examined and 245,698 currant and gooseberry bushes located and destroyed.

Camp Cardigan—S-54
126th Company

Cardigan Mountain—A sixteen-foot road $1\frac{3}{4}$ miles long was built on the Alexandria side of Cardigan extending from the Red School house to the camp of the Appalachian



The 126th Co. fought many forest fires.

Mountain Club. Two log bridges and drainage of re-enforced concrete were constructed. A road of one-half mile to the Welton Falls reservation was completed. On the Orange side starting at the boundary of the state land and continuing to the old hotel site, a road of $1\frac{1}{2}$ miles is under construction, being about three-quarters completed. An old well near the hotel site was cleaned out and cement capped.

Two miles of telephone pole line was constructed from the foot of the mountain to the old watchman's cabin. A small parking area was constructed at the old hotel site on the Orange side.

On the Cardigan Mountain State Forest the boundaries, 12.6 miles, were surveyed and marked, and the entire area of 3,309 acres type-mapped. In the fall of 1933, 10,000 three-year white spruce seedlings and 500 three-year balsam fir seedlings were set out. During the spring of 1934, 5,700 five-year red spruce transplants, 2,750 five-year red spruce, and 1,500 five-year red pine transplants were planted. This planting covered a total of 21 acres. Seven acres of softwood were released and three acres of young hardwoods thinned near the old mill. There was also a general improvement cutting over 85 acres resulting in 362.5 cords of wood including poles for the CCC camp. One and four-tenths miles of roadside were cleaned up.

Douglass—A parking area has been partially provided. One open shelter 18x24 feet was constructed and repairs made to the caretaker's cottage. A double garage for the caretaker and lookout watchman was also built.

Franconia Notch—On July 1, 1933, the U. S. Forest Service loaned the state ten men for five months. This detail came from the Gale River CCC camp in Bethlehem. In October, 20 men were picked from the State CCC camp at Danbury and established in the Notch as a side camp.

Work commenced with a general clean-up and maintenance of areas used by the public. One mile of foot trail, at the head of the Notch, was repaired and 1½ mile of ski trail built, one mile of which included the famous Taft trail. Floating debris and logs along the shores of Profile and Echo Lakes were cleared up and many dead and broken trees, unsightly and dangerous, along the highway and path around Profile Lake were removed.

A single-track road, one-fourth mile in length, leading from the highway to the new camping ground and returning to Lafayette Clearing was built. The growth on an area of the new camp site was cleaned up, the stumps dug out, and with other debris hauled to the gravel bank at the head of Echo Lake. Three foot bridges were built and a 12-foot log bridge with a 24-foot span on heavy rock abutments con-

structed over the Pemigewasset at the Lafayette Clearing. A 10,000 gallon water tank was erected and 800 feet of pipe laid under ground. Three large cement septic tanks for the camp ground were built and drain pipes laid. The parking area was cleared of existing growth and the land graded.

About five acres of forest improvement work was completed and 100 cords of wood cut and fitted. A side-camp detail worked on the construction of the caretaker's quarters at the camp ground. This side camp contributed much in the general improvement and maintenance work essential in the upkeep of the reservation.



Picnic shelter at Wellington Beach, constructed by CCC crews of the 126th Co.

Kearsarge Mountain—The watchman's cabin was shingled both on the sides as well as the roof. It was stained and painted and a new floor laid in the building. A telephone pole line $1\frac{1}{2}$ miles in length was completed.

A spring on the mountain side was cleaned out and a cement casing built and the whole topped off with a shelter. A pipe line 1,500 feet in length leads from the spring to a picnic area and the caretaker's house.

In co-operation with the Town of Wilmot and the State Highway Department the mountain road has been improved from the foot of Morgan's Hill to the old Winslow site, a

distance of two miles. The town furnished all necessary gravel and the Highway Department re-enforced cement culverts.

The Kearsarge State Forest had a general improvement cutting on 146 acres yielding 440.5 cords of wood. Seventy-one acres were thinned, including three acres of young spruce near the Winslow House site. The slash was burned in the spruce thinning in order to reduce fire hazard. Fifty-seven cords of wood were realized from the thinning. One hundred and eight acres of plantation were released. Weevilled leaders were removed on 65 acres of pine plantation near the Chase Farm site. In the spring of 1934, 2,500 five-year red pine transplants, 6,250 five-year white spruce transplants, and 1,800 three-year white spruce seedlings were planted on 11 acres of cut-over land. The roadside along the north side of the tract, about one-half mile, was cleaned up. The boundaries, 6.6 miles, were surveyed and marked. Also 150 acres near the old Chase Farm were type-mapped.

Wellington Beach—In addition to a large bath house, previously erected by the State, a modern toilet, 14x20 feet, was constructed and attached to the bath house. Two open standard shelters, 18x20 feet, were erected for the convenience of the public and placed at either extremity of the bathing beach. An addition to the caretaker's cottage was made and also a garage was built.

An electric pump outfit equipped with a chlorinating system was set up in order that an adequate supply of water from the lake might be assured the toilets. It is planned to extend the water supply to the picnic grounds. A telephone and electric light line one-half mile long was built into the reservation.

The parking space for cars has always been inadequate. During the winter of 1934 a portion of the swamp was filled with 4,500 yards of gravel which will provide an additional area of about one and a third acres, accommodating more than 250 cars. Several trails connect the parking area with the beach.

Boundary Surveys and Type-Mapping—Four and two-tenths miles of boundary on the Province Road tract were surveyed. On the Welton Falls tract five acres of plantation were released, 7.9 miles of boundary surveyed and marked, and completely type-mapped. The boundaries of Black Mountain tract, 3.2 miles, Ragged Mountain tract, 1.7 miles, and the CCC camp area .4 miles were surveyed. Town land was also surveyed for Grafton, 7.3 miles, for Orange, 9.3 miles, and for the city of Franklin on the Great Gains, 5.7 miles and Webster Park 2.4 miles.

Blister Rust Control—White pine blister rust control was carried on in Alexandria, Danbury, Orange and Wilmot, there being 404,538 currant and gooseberry bushes destroyed on areas totaling 9,601 acres.

Camp Monadnock—S-55 **118th Company**

Annett—Two and one-half miles of truck trails have been regraded and gravel surfaced. Two new bridges were built and all roadside improvement completed. An acre of ground is being cleared for a picnic and parking site at Hubbard Pond, and a half mile of truck trail to a two-acre picnic and camping ground at Dewey Beach is nearing completion.

On this tract 73 acres of low grade hardwoods were cut over, giving 1530 cords of wood for use at the camp. On 40 acres the slash was burned to reduce the fire hazard and to make planting easier. In the spring of 1934, 2,000 two-year red pine seedlings, 58,750 three-year red pine seedlings, 34,000 four-year red pine transplants, 9,000 five-year red pine and 16,000 three-year white pine seedlings were set out, covering 147 acres. Two and a half miles of roadside on the tract were cleaned up. The boundaries, eight miles, were surveyed and marked.

Bedford Charity Camps—One mile of road has been graded and surfaced through the several properties in this vicinity. A new athletic field was built by the removal of

1,800 yards of earth and a concrete retaining wall 150 feet in length.

A white pine plantation and grove near the Blind Boys' and Girls' camp was released of competing hardwoods and the brush resulting piled and burned; this operation being conducted over an area of about ten acres. Prospective camp sites were cleared for two other charitable organizations. The shore line of Sandy Pond, adjacent to the camps, was cleared up through the removal of stumps and the whole area, aggregating seven acres, was leveled off.

Binney Pond—One-half mile of the Wapack Trail was cut out and improved. A camp site of one acre was cleared, the spring cleaned and a permanent fireplace constructed.



Through trail and camp-ground improvements, the Monadnock Reservation will afford greater opportunities for recreation than ever before.

On this tract 25 acres were thinned in hardwood types. Many spike-topped trees were girdled to make room for more desirable trees.

Bullet Pond Town Forest—On this tract, owned by the town of Jaffrey, 81 acres were improved, from which 67

cords of fuel wood were secured. Release work was performed on 52 acres, pruning on seven and brush burned on 22 acres. Fifteen thousand four-year red pine transplants and 4,000 four-year white pines were planted.

Casalis—A large two and one-half story house has been painted, floors scraped and refinished and the foundation walls repaired. The driveway was graded and graveled and the lawns seeded down. Repairs were made to the existing water system as well as to the old barn.

This property contains over fifty acres of pine plantation established prior to its acquisition by the state. Forty-three acres were thinned, resulting in 162.5 cords of wood. Eleven acres of plantation were pruned. Also slash was burned on 30 acres for fire hazard reduction. In the spring of 1934, 24,000 three-year white pine seedlings, 1,300 Scotch pine seedlings, and 900 three-year Scotch pine transplants were planted. One-half mile of roadside was cleared up and the boundaries, 6.6 miles long, were surveyed and marked. The entire area of 247 acres was type-mapped.

Haven—Two and one-half miles of trail have been cut out and improved and a spring built.

An improvement cutting was made on 44 acres, which gave 31 cords of wood. This cutting removed dead and broken pine, and defective hardwoods along the trails. A thinning of 61.5 acres was made in the hardwood and mixed types in the central and eastern parts of the tract. Seventy-five and one-half cords of wood were cut in the thinning. In the spring of 1934, 500 three-year white spruce seedlings were planted on one acre. The boundaries were run out and marked and the entire area type-mapped.

Hyland Hill Lookout Station—One mile of truck trail has been resurfaced and graveled and eleven drainage structures built. To tie the lookout station up with the New England Telephone system, 1½ miles of pole line was built.

One mile of roadside was cleaned up on the road to the lookout station.

Kimball—Five acres of plantation were released on the Kimball tract and three acres were selectively pruned. The boundaries were run out and marked and the area type-mapped.

Miller Park—Situated on the summit of Pack Monadnock, the Miller Park reservation of three acres is being made more accessible by the rebuilding of $1\frac{1}{2}$ miles of the old road. The road has been widened and with better drainage this 16-foot highway will give access to a parking area from which far reaching views of southern New Hampshire may be obtained.

Monadnock—The camp ground on the Poole Memorial tract has been increased by three acres and about one-half mile of fire line road constructed around it. The camp ground has been greatly improved by grading and several fireplaces have been added, together with six picnic tables. A woven wire fence, 1,150 feet in length, separates the town reservoir from the camping and parking areas.

New buildings include two open shelters, 18x24; a garage, 10x20, for the caretaker's use; two modern equipped comfort stations, including showers. An addition to the caretaker's cabin was built for the public use. All buildings are shingled on sides and roof and stained brown.

Just above the camp ground, on Meade Brook, a small cement dam was built and with 2,600 feet of pipe furnishes a water supply for the caretaker's cabin, toilets, etc. Two cabins on the mountain side have been repaired and cleaned up, camp sites, picnic grounds and springs throughout the forest have been cleaned and all brush and dead trees burned. Ten miles of trails have been improved and all main trails marked or painted. Three-quarters of a mile of fire line has been cleared of brush and dead trees. Three vistas opened up through the forest give views of the mountain and the surrounding country. One-half mile of truck trail to the lookout cabin was graded and improved. Wood suitable for use either at the caretaker's cabin or the camp ground has been hauled out.

Sixty-five and one-half acres of mixed hardwood growth were thinned on the Monadnock Reservation. The slash on six acres along the Fire Line trail was burned to reduce fire hazards. Eight thousand five hundred three-year white spruce seedlings and 2,150 three-year red spruce seedlings were set out in the spring of 1934. The boundaries of the entire area including the Gay, Poole and Sawyer lots were surveyed and marked, and the area type-mapped.

Ponemah—In the spring of 1934, 900 three-year Scotch pine transplants and 1,300 two-year Scotch pine seedlings were planted.

Pulpit Rock—This worth-while recreational tract has been cleared of brush and other debris, and one mile of road leading into it rough graded.

Five acres were improved, principally around the "Pulpit." The boundaries were also surveyed and the area type-mapped.

Thorndike Pond Town Forest—Two-tenths of a mile of road leading to a camp site is partially completed. An acre was improved for a camp site and picnic ground by the removal of brush and dead trees. Two permanent fire places have also been constructed.

The lot was thinned, yielding 14 cords of wood. Brush was burned on eight acres.

Water Holes—The following water holes have been built for forest and town protection: Bedford 6; Rindge 5; Troy 2 and Jaffrey 1. These holes average 25x25 feet and 6 feet deep and will furnish an abundance of water for the small portable fire pumpers.

The Grant, Leighton, Marlboro and Russell tracts also had their boundaries surveyed and marked and the areas mapped.

The boundaries only were run out on the Beech Hill, Hodgman, Pot Holes and LaPointe area of the Pulpit Rock state tracts.

Blister Rust Control—In the towns of Dublin, Marlboro, New Ipswich, Rindge, Sharon and Temple areas totaling 16,304 acres were examined and 1,314,112 currant and gooseberry bushes located and destroyed.

Moose Brook—SP-1
392nd Co., Vet.

Under the supervision of the Forestry Department and the National Park Service of the United States Department of the Interior a new entrance road was built from Heath Road to an old town road which was widened and re-graded. A pond was created by building a log crib dam and bridge over which the new road passes. This road will be extended across the upper branch of Moose Brook to a parking space near which excavation for a second log crib dam has been started. This will provide another pond for the use of campers on the upper field and picnickers along the brook.



Construction of Dam on Moose Brook State Park, Gorham.

An existing bridge on the town road was replaced by a more substantial one, while a smaller bridge across the lower branch of Moose Brook opens up the areas south of Heath Road for camping and general recreation.

At the lower pond a bath house is in the process of construction. This building will be used by local people and by those campers who tent on the proposed camp grounds nearby.



The construction of Moose Brook Park is handled by a Veteran's Company of the Civilian Conservation Corps.

A system of trails and foot bridges has been constructed along the brook which will make accessible the upper pond and such other recreational features as picnic areas and the fish pools which have been created by building simple log dams.

The work of forest improvement has consisted in the removal of undesirable species as well as dead and fallen trees and some thinning on about 500 acres. Besides yielding about 200 cords of wood for the use of the camp, several camp grounds and picnic areas have been cleared. Type maps for about 500 acres of the park have been completed.

The few buildings which were purchased by the State along with the park land have been painted and re-shingled and some alterations made to adapt them for administrative and other purposes.

WHITE PINE BLISTER RUST CONTROL

By The Civilian Conservation Corps

Season of 1933:

Five companies of the Civilian Conservation Corps were established on or nearby state forests during the month of June, and almost immediately undertook the project of blister rust control. Out of a total of 200 men comprising each company, an average of 68 per camp were daily engaged in the eradication of wild ribes, (currants and gooseberries). In order that the work-day might be made the most of, the towns selected for this project were of a necessity within distances ranging from one up to 15 miles. The training of members of the Corps in a specialized type of work such as blister rust proved somewhat difficult inasmuch as a large proportion of the men were city bred and unfamiliar with woods conditions or plant life. However, long before the season terminated, the CCC crews were performing excellent service. Much of the credit for this successful training is due to the several foremen attached to these camps. In the following tabulation the work of each of the five state camps is summarized.

CCC BLISTER RUST SUMMARY STATE CAMPS

Camps	No. Towns	Initial		Re-eradication		
		Acreage	Wild Ribes	No. Towns	Acreage	Wild Ribes
Cardigan	4	6,305	231,160	1	68	145
Hemenway	6	7,669	136,418	1	87	1,688
Monadnock	3	5,078	823,016	4	5,161	91,478
Pawtuckaway	4	3,759	272,011	2	630	28,385
Pillsbury	5	5,515	647,225	1	131	35,726
Totals	22	28,326	2,109,820	9	6,077	157,422

Control measures were also conducted from three National Forest camps, some of the work being carried upon government lands, although the greater proportion of the projects protected private pine areas.

One crew, averaging 10 men daily, worked from the 151st Company, located between Glen and Upper Bartlett, and

conducted control upon the Bartlett Experimental Forest and National Forest holdings in Albany. The Campton crew, of the 1101st Company, and averaging 13 men, worked on both national and private forest lands. The 134th Company, near Warren, supplied an average of 17 men daily, and conducted eradication of wild ribes mostly on private lands, altho several small areas of federal pine were protected. In Bethlehem, on the Gale River Experimental Forest, an average of 18 men daily from the 153rd Company carried on control work for the purpose of protecting several white pine plantations. The accomplishments of these camps follow:

CCC BLISTER RUST SUMMARY
NATIONAL FOREST CAMPS

<i>Camps</i>	<i>No. Towns</i>	<i>Initial</i>		<i>Re-eradication</i>		
		<i>Acreage</i>	<i>Wild Ribes</i>	<i>No. Towns</i>	<i>Acreage</i>	<i>Wild Ribes</i>
Campton	2	3,352	178,755	2	131	20,151
Gale River	1	630	5,622	....	....	....
Glen	1	91	11,301	2	1,170	64,764
Warren	3	1,808	120,748	2	497	40,921
Totals	7	5,881	316,426	6	1,798	125,836

For the entire season of 1933, state and national forest camps of the Civilian Conservation Corps worked areas aggregating 34,207 acres of pine lands initially, and destroying 2,737,050 wild currant and gooseberry bushes, in 29 towns. The total of re-eradication amounted to 6,875 acres from which 283,258 ribes had been removed.

Season of 1934:

Owing to the increased number of forestry projects at the CCC camps, the number of crews for blister rust control were somewhat reduced. Three camps were allotted two crews (24 men each), while the remaining two were given three crews (36 men each). The average number per camp per day engaged in this project was twenty-six.

Eradication of wild ribes was continued in 10 towns worked in 1933. In addition, initial or re-eradication was

conducted in six other towns. Toward the end of the field season unusually heavy rains interfered materially with control measures. Accomplishments of the five state camps for the second season are given below.

CCC BLISTER RUST SUMMARY STATE CAMPS

<i>Camps</i>	<i>No. Towns</i>	<i>Initial</i>		<i>No. Towns</i>	<i>Re-eradication</i>	
		<i>Acreage</i>	<i>Wild Ribes</i>		<i>Acreage</i>	<i>Wild Ribes</i>
Cardigan	1	3,228	173,233	....	....	....
Hemenway	1	1,543	90,215	2	2,257	17,377
Monadnock	3	5,505	356,884	1	560	42,734
Pawtuckaway	3	3,114	286,002	2	744	28,490
Pillsbury	4	3,899	159,989	2	292	67,806
Totals	12	17,289	1,065,323	7	3,853	156,407

Co-operative control was again carried on with the National Forest Service, the state camp at Tamworth working certain areas of pine in the eastern extremity of Albany, while the 151st company of the Federal Forest Service carried on protective measures in the western section of the same township. From the 134th Company, in Warren, a detail of 12 men, for 30 days, worked on private lands in Wentworth. Control work, by the 153rd Company, at Bethlehem, was continued on the Gale River Experimental Forest.

CCC BLISTER RUST SUMMARY NATIONAL FOREST CAMPS

<i>Camps</i>	<i>No. Towns</i>	<i>Initial</i>		<i>No. Towns</i>	<i>Re-eradication</i>	
		<i>Acreage</i>	<i>Wild Ribes</i>		<i>Acreage</i>	<i>Wild Ribes</i>
Gale River	1	99	92,460	1	137	48,690
Glen	1	....	....	1	1,185	43,413
Warren	1	959	67,819	1	150	27,366
Totals	2	1,058	160,279	3	1,472	119,469

The Civilian Conservation Corps at both state and federal camps during the season of 1934 examined public and private white pine lands totaling 23,672 acres.

For the two-year period the blister rust accomplishments of state and federal CCC crews are summarized as follows:

GRAND SUMMARY
CCC BLISTER RUST CONTROL
STATE AND FEDERAL CAMPS 1933-34

<i>Camps</i>	<i>Initial Acreage</i>	<i>Ribes</i>	<i>Re-eradication Acreage</i>	<i>Ribes</i>
State	45,615	3,174,143	9,930	313,829
Federal	6,939	476,705	3,270	245,305
Totals	52,554	3,650,848	13,200	559,134

CCC Mapping—Winter 1933-34:

Upon the completion of the eradication season the checkers assigned to each of the five state camps undertook mapping of prospective control areas in order to determine what portions contained sufficient white pine to warrant eradication measures during the forthcoming season. Single blocks, or areas formed by natural sub-divisions such as roads, streams, etc., were selected and enlarged from the standard U. S. Geological topographic maps to a scale of six miles to the inch. Such permanent features as stone-walls, fences, brooks, swamps and the forest types were mapped. Areas containing insufficient white pine were eliminated from mapping since under the control policy such lands would naturally be excluded from the eradication of wild ribes.

Mapping of this character was conducted in 13 towns and blocks aggregating 39,023 acres were thus covered. In addition, through preliminary scouting, 7,097 acres were eliminated on account of insufficient pine.

CCC Mapping—Fall of 1934:

In order that enlisted men working on the blister rust projects during the eradication season might become more familiar with control methods and thus more valuable in this work, squad leaders of each six-man unit, who appeared to be qualified, were selected and trained in the blister rust method of mapping. This program appears to be working out well and a considerable acreage has already been mapped by these men under the personal direction of a CCC foreman. This experience should also prove of value to the enlisted man upon expiration of his enlistment period.

SUMMARY OF CONSTRUCTION WORK
STATE FOREST CCC CAMPS
JULY 1, 1933-DECEMBER 31, 1934

Camp	Buildings Constructed or Repaired	*Dams & Water Holes	Water Systems	Roads & Truck Trails		Foot Trails	Ski Trails	Parking Camping Areas		Telephone and Power Lines
				Number	Miles			Number	Miles	
S-51 Pillsbury	5	18	750	6	.....	1 1/2	5	6 1/2		
S-52 Pawtuckaway	6	8	....	7	3	1	4	5		
S-53 Hemenway	12	12	2,640	7	12	5 1/2	3	2 1/2		
S-54 Cardigan	10	6	1,000	7	5	12	7	4		
S-55 Monadnock	7	14	2,950	8	9	....	7	3		
Totals	40	58	7,340	35	29	20	26	21		

*Dams over 100 feet 5.

SUMMARY OF FOREST IMPROVEMENT WORK
STATE FOREST CCC CAMPS
JULY 1, 1933-DECEMBER 31, 1934

Camp	Imp. Out- side tings	Thin- nings	Releas- ing	Road- side Imp.	Products		Prun- ing	Fire Hazard	Woods Roads	Reforesting	Blister Boundary		Type- Mapping	
	Acres	Acres	Acres	Miles	Cords	Board Feet	Acres	Acres	Miles	Acres	Acres	Miles	Acres	
S-51 Pillsbury	526	58.5	302	7.4	1,381.7	7,761	8	45.0	13	109.5	108,900	9,837	91.99	5,004
S-52 Pawtuckaway	191	8.0	11	5.8	962.0	.....	6	231.5	....	62	63,000	8,247	44.6	2,790.9
S-53 Hemenway	178	.....	14	13.5	1,405.0	30,000	3	247.0	4	151.0	165,000	11,556	43.58	3,787.0
S-54 Cardigan	236	74.0	120	2.9	960.0	.....	.....	8.0	....	42.0	35,000	9,601	61.3	3,692.0
S-55 Monadnock	203	205.0	67	4.0	1,884.0	.....	21	108.0	....	212.0	178,300	16,304	54.8	2,696.5
Totals	1,334	345.5	514	33.6	6,592.7	37,761	38	639.5	17	575.5	549,900	55,545	296.27	17,970.4

WHITE PINE BLISTER RUST CONTROL

(In Coöperation with Towns)

Town Cooperative Control 1933:

Twenty-one towns appropriated a total of \$4,575 for continuing blister rust control measures, and nine the sum of \$1,850 for a re-examination of their pine areas worked several years previous. To both groups the State extended financial aid in an amount equal to nearly 50 per cent of town funds raised. The local crews were made up from the unemployed list obtained from town authorities, and a total of 245 men were given work in this co-operative project. Through funds allotted from Section 7, Chapter 150, control measures were also continued in 26 additional towns. Eradication was also carried on in two towns upon lands of the National Forest Service. The following tabulation indicates the accomplishments in these three programs.

SUMMARY—TOWN AND STATE CONTROL *Initial Work*

<i>Project</i>	<i>No. Towns</i>	<i>Acreage Covered</i>	<i>Wild Ribes</i>
Town Co-operative	21	19,580	987,181
Sec. 7, Chapter 150	26	22,285	656,611
Public Forests	2	1,131	31,212
Totals	49	42,996	1,675,004

In all three projects a total of 448 men were employed for varying periods.

Town Co-operative—Re-eradication 1933:

Re-eradication was continued in 12 towns through local appropriations and an allotment of funds from Sec. 7, Chapter 150. Two individuals also paid for control work upon their properties.

SUMMARY—TOWN AND STATE CONTROL
Re-eradication

<i>Project</i>	<i>No. Towns</i>	<i>Acreage Covered</i>	<i>Wild Ribes</i>
Town Co-operative	9	9,740	236,056
Sec. 7, Chapter 150.....	3	2,145	16,020
Individuals	2	1,565	28,826
Totals	14	13,450	280,902

Nursery Sanitation—1933:

During this season the properties and environs of the Keene Forestry Associates and that of the State Forest Nursery were re-examined for the purpose of determining the re-occurrence, if any, of wild ribes. In previous years both nurseries have been initially protected, but in the interests of the public purchasing forest planting stock, it is important to insure trees free from the rust. Although thousands of bushes had been destroyed on the Keene Nursery and several hundred at the State, but 115 and 42 ribes respectively were located in this re-inspection, or a total of 157 over 431 acres.

Town Co-operative Control—1934:

Although the Forestry Department did not make recommendations prior to town meeting regarding the continuance of blister rust control, eight (8) towns voted the sum of \$2,100. These towns were divided nearly equal between initial and re-eradication. In view of the un-employment situation every attention was given to utilizing men most in need of work, and who were physically able. The rate of wages paid were identical to the local town rate established at the recent town meeting.

The Governor and Council authorized an allotment from Sec. 7, Chapter 150, and control work was conducted in eighteen (18) towns, in addition to the eight which had appropriated funds.

Through the Federal Bureau of Plant Industry, U. S. Department of Agriculture, the sum of \$20,000 was made available from National Recovery Act monies. By this

means, control work was carried on in seventeen (17) towns where the employment situation was acute. Crews working under this allotment were obtained from the several National Re-employment offices. A summary of the initial work performed on each of these three projects follow:

TOWN, STATE AND FEDERAL CONTROL
Initial Eradication

<i>Project</i>	<i>No. Towns</i>	<i>Acreage Covered</i>	<i>Wild Ribes</i>
Town Co-operative	3	2,362	158,966
Sec. 7, Chapter 150	18	21,147	1,127,374
National Recovery Act	17	33,872	988,571
Totals	38	57,381	2,274,911

Town Co-operative Re-eradication 1934:

An examination of certain control areas worked several years previous was carried on in seven towns as shown by the following table.

TOWN, STATE AND FEDERAL CONTROL
Re-eradication

<i>Project</i>	<i>No. Towns</i>	<i>Acreage Covered</i>	<i>Wild Ribes</i>
Town Co-operative	5	5,218	106,561
Sec. 7, Chapter 150	1	387	522
National Recovery Act	1	7	5,629
Totals	7	5,612	112,712

On both initial and re-eradication projects a total of 402 men were employed for varying periods.

For the two-year period covered by this report 3,949,915 wild ribes were located and destroyed on 100,377 acres. Re-eradication was conducted on 19,062 acres.

Winter Mapping—NRA Funds:

Through an allotment of National Recovery Act funds fifteen men were given temporary appointment and placed under the immediate supervision of the district blister rust

control agents. Mapping of pine areas, in which control measures appeared desirable, was conducted through a standardized system inaugurated some years ago. (*See Biennial Report of 1932—pages 107 to 110 inc.*)

This project was conducted in 40 towns and seven counties during the fall and winter of 1933-34, and a total of 106,636 acres were mapped. Such a project aided materially in the eradication during the summer which followed. Moreover, these maps will prove of great value, and lower the cost in future years when a re-examination of control areas is needed in maintaining control.

Effectiveness and Need of Control Measures:

It is only natural that among pine owners, as well as others directly engaged or interested in this work, that the question should arise, "*How effective has the destruction of currants and gooseberries been in the control of this disease?*"

Inasmuch as the needles of white pines persist for about two years, and since infection takes place through these needles, it is possible to determine very closely the year in which a pine becomes infected by the rust. For example, if an infection is found on the 1927 growth, it is fairly certain it took place either in 1927 or 1928, thus pinning the date down to within twelve months. As two to three years of development are required after infection takes place before the canker, or outbreak, is easily recognized, the more recent infections, such as those of 1933-34, cannot be listed in any survey or study.

The District Blister Rust Control Agents have conducted investigations through the laying out of strip-lines, one rod wide, and also plots. This series of studies was conducted during 1934, in protected and unprotected areas. These investigations were conducted in the following 28 towns: Alton, Barnstead, Bath, Brentwood, Canaan, Charlestown, Deerfield, Enfield, Exeter, Hampton Falls, Hanover, Haverhill, Landaff, Lebanon, Littleton, Loudon, Marlboro, Marlow, Moultonboro, Northwood, Nottingham, Piermont, Pittsfield, Plainfield, Sandwich, Tuftonboro, Warner and Winchester.

Owing to the distribution of these towns it is felt that such studies represent a fair cross-section of the situation as regards control.

BLISTER RUST INVESTIGATIONS
IN PROTECTED AREAS

<i>Per Cent of Pines Healthy</i>	<i>Per Cent of Pines Diseased</i>	<i>No. Infections Prior to Control Measures</i>	<i>New Infections Occuring After Control Measures</i>	<i>Per Cent of Infection After Control</i>
63.4	36.6	6,973	187	2.6

These studies in areas from which currant and gooseberry bushes had been removed from five to ten years previous, indicate quite clearly the success of the control measures. The development of infections since control measures were applied, as represented by the 2.6 per cent, were due either to a small number of missed bushes, or a limited re-occurrence from seed left by the parent bushes.

BLISTER RUST INVESTIGATIONS
IN UN-PROTECTED AREAS

<i>Per Cent of Pines Healthy</i>	<i>Per Cent of Pines Diseased</i>	<i>No. Infections Prior to 1930</i>	<i>No. Infections 1930-1932 inc.</i>	<i>Per Cent Infection 1930-1932 inc.</i>
42.5	57.5	3,210	1,366	29.8

It will be noted by the above tabulation that nearly 60 per cent of the pines on these areas are infected by the rust, and also that of all infections found nearly 30 per cent took place during the three year period 1930-1932 inclusive. Had control measures been applied earlier the per cent of recent infection would have been reduced at least one-third, and probably more.

It is planned to continue periodically similar studies. From time to time it will be necessary to determine what re-occurrence of ribes is taking place so that where necessary a partial reworking of old control areas may be made. Experience has indicated that control work should be rechecked five to eight years after the initial examination in order that control of the rust may be maintained.

NECESSITY OF PROTECTING WHITE PINE



Early in January, 1934, a committee of the New England Section of the Society of American Foresters, after considerable investigation, made a report on white pine blister rust control. The Committee's opinions in connection with the rust, the value and culture of white pine are believed to constitute the best and most able summarization on the subject that has been made to date. The following excerpts are taken from this report.

"The paramount fact in regard to white pine blister rust is that without control, eastern white pine (*Pinus strobus*) cannot be perpetuated in New England except over limited areas where the number of *Ribes* (currant and gooseberry) bushes is small. Even on such areas it is likely that white pine will be eliminated ultimately, or so badly malformed and reduced in amount as to be practically worthless, but the damage will be slow enough to give a false sense of security."

"Over the years that blister rust has been epidemic in the East, there is no indication that white pine has developed the slightest resistance to it. The disease attacks and kills thrifty trees more readily than it does slow-growing, suppressed ones."

"Blister rust is not spectacular. On unprotected areas, the disease increases slowly and then rapidly. Seedlings and small saplings are infected and killed quickly, while poles and larger trees are killed slowly. Consequently, a white pine stand where blister rust is epidemic may appear little affected for many years, judging only by the larger trees, but there will be an almost complete absence of seedling and small

saplings. The successive crops of seedlings succumb after a few years and nothing is left to perpetuate the stand when the mature trees are cut or finally killed."



Low quality eastern white pine is competing with high quality western pine.

"Over the forests of New England where white pine forms a significant proportion of the stand, it is a highly desirable species. At present most of the white pine lumber on the market is low in quality because it comes from relatively young stands of second growth which have been allowed to develop without cultural operations such as thinning and pruning, and which have not been allowed to mature to desirable quality because of high taxes. Furthermore, most of it is poorly manufactured. Grade for grade white pine commands a higher price than any other New England softwood."

"At the present the market for white pine is poor, but so is the market for all other species in the region and in fact for the country as a whole. Low quality eastern white pine from second growth in New England is competing with high quality western white pine from virgin growth in the inland Empire. Most eastern white pine lumber now on the market would be unsalable in the West. Once the virgin stands of western white pine are liquidated, eastern white pine will be able to compete more closely on a quality basis.

In addition, charges for fire protection, blister rust control and transportation to market will be much higher for western white than for eastern white pine. Probably large areas in Idaho will be eliminated by blister rust from the future production of western white pine so that the supply of timber from second growth of this species will be reduced. These factors favor the future competitive position of eastern white pine."

"Eastern white pine is a wood adapted for special uses. If white pine ceases to be a factor in New England forests there is no satisfactory replacement for it in sight."

"Aside from its commercial value, when of good quality, white pine has a real but intangible aesthetic value. Over



White pine cannot be perpetuated without blister rust control.

the entire country coniferous forests have a much greater appeal to recreationists than hardwood forests. The coniferous forests are all-year forests, while hardwood stands during their leafless period are not attractive. Much of the beauty of extensive areas in New England is . . . largely attributable to white pine. Its value is strongly emphasized by many estate and resort owners."

"An effective method of control has been developed and extensively applied in New England under the leadership of the federal government cooperating with the states. This consists of the eradication of *Ribes* from within and around white pine stands for a distance of 900 feet. The eradication of the European black currant and its elimination from the nursery trade has proven invaluable. The initial eradication of *Ribes* by the end of the year 1933 had protected the major portion of pine acreage in New England worth protecting."

"With the large acreage already protected, the future of white pine in New England is assured as far as blister rust is concerned, *provided* maintenance work consisting of the necessary re-eradication is continued. *To abandon blister rust control now would be to lose a battle, that has been won.*"

"The results so far secured in protecting white pine are directly attributable to the leadership of the Division of Blister Rust Control of the U. S. Department of Agriculture in co-operation with the state authorities. If this leadership had not been made available, most of the white pine in New England would have been abandoned to blister rust. For future success it is necessary that this leadership be continued, so that the owner desiring to protect his timber can have the expert advice and supervision needed to make *Ribes* eradication effective."

"To sum up then, eastern white pine is a highly desirable species silviculturally over a large forest area in New England. Economically, its position can be improved by growing it for quality rather than quantity. This will necessitate thinning, pruning and other cultural practices, as well as allowing timber to mature to a greater age. It should be grown in mixed stands, particularly in mixture with hardwoods, although it will also continue to be grown in pure stands to some extent. The species cannot be perpetuated without control of blister rust, but this parasite can be controlled effectively and at a cost which can be borne by good stands."

CWA WORK DIRECTED BY THE FORESTRY DEPARTMENT

November 17, 1933 to March 29, 1934



HIS brief description and summary of the work accomplishments under CWA by the Forestry Department are included for their value as permanent records of the Department. During the organization stages of CWA, Governor Winant and civil works authorities requested the Department's co-operation in the supervision of about 1,500 men, in view of facilities and field personnel available for the task. Steps were therefore taken to employ these men in the performance of necessary public works and plans made to establish 139 ten-man crews, each under direct supervision of a foreman.

District fire chiefs and blister rust control agents were pressed into this emergency service as supervisors to organize the local crews. Individual work projects had to be determined, written up and approved. Tools and transportation had to be arranged for the crews. Many town officials and others had to be contacted. Little advance notice was given and there could be no delay. Eighty-four (84) crews worked during the first week (ending November 23, 1933); 124 crews working during the second week and 127 crews had been organized for work during the third week, a total of 1,397 men.

Rates for laborers were set by CWA at 50 cents per hour, with a 30-hour week. Foremen received \$30 per week and were required to furnish their own transportation and engage in extra hours of work in order to keep their crews and projects fully organized. On January 18th, a revision of pay was put into effect through a reduction to 15 hours per week in rural towns and to 24 in urban. This continued until February 16th when, due to a depletion of CWA funds, a further reduction was made by paying laborers 40 cents per hour and foremen 80 cents, the number of hours being 15 for rural and 24 for urban, per week.

Early in December, during the third week of participation in CWA work, assistance was solicited in manning the federal pest control project directed by Prof. W. C. O'Kane. The Department released to him 78 ten-man crews with foremen, a total of 858 men, together with five men of its supervisory personnel. Authorization was given to employ



Many recreational developments were conducted by CWA, some not supervised by the Forestry Department.

replacements and 63 new crews were then organized, with a total of 693 men. It will be seen that within four weeks the Forestry Department organized 190 ten-man crews with foremen, a total of nearly 2,100 men. The valuable assistance received from managers of the National Re-employment Service in the several regions greatly accelerated the task of organizing crews. At the peak, the Department directed the efforts of nearly 1,400 men engaged in a wide variety of projects on 16 state forest tracts, 26 town forests, other public lands, along roadsides and elsewhere.

In general the work consisted of forest improvement, roadside improvement, pest control, forest fire hazard reduction, recreational development, improvement of water works and many other projects normally carried on by towns and cities when funds permit. Some of these works, not a part of the Department's normal program, were conducted be-

cause of the need of providing employment to men in all parts of the state, frequently in places where the state does not own land. Thus, Selectmen and other town authorities were requested to lay out desirable work projects for crews assigned to their towns.

Forest improvement work consisted of weeding undesirable species, thinning of stands to favor desired reproduction, brush cutting and burning in preparing land for reforestation, pine weevil correction and destruction of white pine infested with blister rust, as well as other forms of silviculture. Work of this nature was conducted on 42 state and town tracts and 1,342 acres received necessary attention. During the process, 3,900 cords of firewood were produced for use of relief authorities.

Roadside improvement work was usually carried on in towns not having any public lands. This consisted of brush cutting and burning, felling of undesirable trees and pruning of ornamental growth, slash and debris disposal, rebuild-



Clearing up and burning of slash to reduce fire hazards were carried on by CWA crews.

ing of fences, stone walls, etc., the purpose being to improve the appearance of the roadsides, facilitate travel, allow penetration of sunlight for earlier drying out of roads in the spring, reduce fire hazards, etc. About 565 miles of roadside

were thus improved, resulting in the incidental production of 3,514 cords of wood, most of which was left for abutters, but some of which probably found its way to the public wood pile for relief purposes. Slightly more than 57 M feet of lumber was also cut, some going to abutters, while part was used in building, or repairing, town bridges.



Water-holes, for forest and building protection, were created extensively.

Pest control was carried on during the first three weeks of the program and consisted of cutting out brown-tail moth webs and in painting with creosote gypsy moth egg masses. A total of 544,734 brown-tail moth webs and 1,438,224 gypsy moth egg masses were thus destroyed. Further work along this line was conducted by Prof. W. C. O'Kane, from December 8, 1933, to the end of his project.

Forest fire hazard reduction consisted of water hole construction, for storage of water during wet periods for later use in dry weather, construction of fire breaks and lanes in dangerous fire areas, brushing out of abandoned and impassable roads for quick access to fire areas or water supplies in case of fire. Some bad slash areas, aggregating 85 acres, in inaccessible places were burned or otherwise rendered less dangerous. A total of 103 new sources of water were created by digging new water holes or providing approaches to

existing water. About 75 miles of old roads and trails were brushed out.

Recreational developments were varied and ranged in importance from quite extensive work in Franconia Notch where a shelter was constructed for users of the Taft Ski Trail, piers made and lumber cut for a 24-foot wooden bridge, a new two-acre site cleared for camping, etc., down to the cutting and burning of brush, cleaning of debris, etc., on small town areas adjoining roadsides, for the use of tourists and campers. Nineteen (19) distinct projects were conducted on areas aggregating 129 acres. One baseball field was graded and leveled, many trails were improved by cutting brush, installing small culverts to divert water, building rustic log steps up steep parts of trails, etc.

Improvement of water works consisted of 58 acres of silvicultural cuttings on the water sheds, and clearing of undesirable growth and debris along four miles of the shores of ponds and streams. Seven (7) town water systems received desirable attention.

Miscellaneous works included cleaning and general care of 18 cemeteries, clearing of 50 acres of land to be used as a state rifle range, remodeling of a barn on state forest land and improvement of the dwelling so as to provide better housing, forest research laboratory facilities, exhibit room and tool room at the Fox Reservation.

This, in a general way, records the accomplishments of crews directed by the Forestry Department. Together with the activities carried on by other departments organized for field work, men were put to work with a minimum of effort and without loss of time. The total expenditures for the CWA projects conducted by the Forestry Department and paid from federal funds amounted to \$227,949.97 for the period. Of this, 65 per cent went into labor. The average weekly wage was \$12.11. It is believed that 90 per cent of the projects were worth while and carried on with fully 70 per cent efficiency. The whole purpose was speed in the employment of man power. There was no place in the program for labor saving machinery. Men without training working

under extreme weather conditions were greatly handicapped. During the period 100 inches of snow fell, and 25 days were below zero, with a minimum temperature of 31° minus. By furnishing them jobs, the morale of men was raised, buying power was increased and living conditions were improved. The amount of direct relief was reduced. Most of the work done could not have been accomplished otherwise. In judging results the relief afforded to unemployed men and other factors must be kept in mind. These men welcomed the opportunity to work and are entitled to praise for their efforts. In the various towns much appreciation was manifested by the authorities and citizens for the unemployment relief afforded and for the results of the work accomplished in their localities.

REGISTERED ARBORISTS

In 1929 an act was passed requiring that persons, firms and corporations soliciting business in improving shade, ornamental and forest trees be registered by a State Arborist Board. This law went into effect in 1930 and 52 persons and companies were certified by the new board. In 1932, 63 were registered, but owing, no doubt to the depression, the number has dropped off and during 1934 but 36 were still registered with the Board. These firms are listed as follows:

REGISTERED ARBORISTS—1934

Leon F. Aldrich, 675 Hammond Street, Brookline, Mass.
Frank H. Bailey & Sons, Box 308, Nashua, N. H.
F. A. Bartlett Tree Expert Company, Boston, Mass.
George E. Bernard, 40 Deering Street, Portland, Maine.
E. L. Butler, Sutton, N. H.
Albert Caron, Milford, N. H.
Ernest J. Chase, 686 Court Street, Keene, N. H.
Charles H. Colby, Milford, N. H.
E. S. Colprit, R. F. D. 1, Dover, N. H.

- Charles Dame, 51 Linden Street, Rochester, N. H.
Davey Tree Expert Company, G. E. Ellinwood, Hollis,
N. H.
G. E. Ellinwood, Hollis, N. H.
H. L. Frost & Company, 20 Mills Street, Arlington, Mass.
Everett M. Hannaford, R. F. D. 3, Peterborough, N. H.
George L. Harkins, 19 Lyndon Street, Concord, N. H.
Hector Hevey, 3 Chapel Street, Newmarket, N. H.
Hill Brothers Nursery, R. F. D. 1, Hudson, N. H.
Hill Tree Expert Company, Turnpike Road, Chelmsford,
Mass.
Donald R. Hill, Chelmsford, Mass.
James H. Hills, Hollis, N. H.
Ralph Moody, 12 Holmes Street, Nashua, N. H.
Munson-Whitaker Company, 1122 Tremont Building,
Boston, Mass.
New England Forestry Association, E. E. Brissenden, 585
Boylston Street, Boston, Mass.
New England Forestry Service, Inc., 141 Milk Street,
Boston, Mass.
New Hampshire Tree Company, Wolfeboro, N. H.
Northeastern Landscape and Garden Service Company,
Peterborough, N. H.
Pollock & Halvorson, Box 183, Pittsfield, Mass.
Clifton E. Richardson, Peterborough, N. H.
James W. Ricker, 18½ Ely Street, Littleton, N. H.
Herman T. Shepard, West Epping, N. H.
William P. Vigneault, 229 Arah Street, Manchester, N. H.
Myles Standish Watson, Newington, N. H.
Russell H. Welsh, 23 Linden Street, Exeter, N. H.
White & Franke, Inc., 30 Camerson Street, Brookline,
Mass.
Woodhead & Stickel, 32 Cherry Street, Waltham, Mass.
Glynn K. Young, 93 Franklin Street, Concord, N. H.

GAME MANAGEMENT STUDY



URING the fall of 1933 the Forestry Commission entered into an agreement with the Fish and Game Department and the U. S. Biological Survey for a ten-year scientific study of game management on the Pillsbury Reservation and elsewhere in New Hampshire. Mr. J. Paul Miller, an expert biologist in the Biological Survey, was selected to carry on this work and has been residing on this reservation since the project started. Mr. Miller outlines the objective of his investigation as follows:

"The object of the investigation is, of course, the discovery and development of additional sources of income from forest lands with particular emphasis on the raising of game for profit. It is recognized, however, that in most instances game management of forested lands can hardly become the dominate objective. At present, it is believed that there are possibilities of co-ordinating it with forestry so as to produce an annual revenue more than sufficient to offset the additional expense.

With this objective in mind, the investigation is being directed along two major lines. The first being to determine the actual effects of various silvicultural practices on various wildlife species that inhabit the forest. The second to determine the minimum amount of game management procedure necessary to produce returns in game on a forested tract: and to determine something as to what may be expected in game yield from various operations. It is hoped that such information will give a basis from which to make recommendations for more efficient land use.

During the past season we attempted to census the game on the reservation to determine just what we had to start with. This was accomplished I think with a reasonable degree of accuracy. Such a census or inventory will have to be continued to determine decreases, increases, and change of habitat. We also constructed trails with the object of creating a limited amount of openings and borders necessary to

wildlife. Although it is felt that in most instances these will fail in that purpose because of narrow width, the object was to determine the minimum from which results could be expected. These will be watched to determine their efficiency, the resulting fire hazard, the cost of maintenance, and their durability. A tower was constructed to facilitate observation. Tentative plans were formulated for the development of the Fletcher Pond Area as a grouse covert.

Plans for the coming season are to make improvements in the grouse covers in the vicinity of Fletcher pond and to plant some of the open area with food and cover. If possible it is hoped to establish a small nursery for experimental work and for holding stock for planting. To prepare game maps for the entire reservation and to keep records particularly in the areas where silvicultural work has been done the past season. Also it seems advisable to keep game records on the sites of lumbering operations in the vicinity of the reservation.

We are unable at this time to give details of the game management as they pertain to the ruffed grouse in New England second growth forests, but it is hoped that such information can be obtained from the studies outlined, and that information relative to other species can be procured incidental to the major study."

THE FOX TRUST FUND FOR FOREST RESEARCH

By HENRY I. BALDWIN, PH.D.



THE Fox Reservation in Hillsboro, given by Miss Caroline A. Fox of Arlington, Massachusetts, in 1922 (See Biennial Report 1922, Page 69), was further increased by Miss Fox in 1923. In 1926 Miss Fox created a trust fund with the National Shawmut Bank of Boston as Trustee, the income from which would be available to the Forestry Department after her death. It was her desire that her home in Hillsboro be used as headquarters for a field station for forest research

and demonstration and that such work be carried on at the Fox Reservation and elsewhere in the state with the funds so provided (Biennial Report 1926, Page 57). Following the death of Miss Fox on February 25, 1933, the fund became available and was formally accepted by Act of the Legislature, March 27, 1933 (Chapter 49, Laws of 1933).



Headquarters of the Fox Research and Demonstration Forest, at Hillsboro.

Forest Problems Which Need Investigation

Considerable change may be noted in the forest conditions in New Hampshire during the past 25-30 years. At the beginning of the conservation movement forest fires were uncontrolled and a constant menace. Lumbering was constantly denuding large areas of virgin timber and causing enormous fire hazards. Today protection is far more efficient and forestry approaches an insurable risk. From 1916 to 1925 the average per cent of the forest area burned in New Hampshire was only 0.11%. Fire protection, it should be emphasized, is an essential condition for the practice of forestry, but is not forestry. Forest production can begin when protection is provided, just as a woolen mill can operate when its factory is protected; but fire protection and fire insurance alone do not constitute woolen manufacture. At present, fire protection has at least reached a point where large areas are

not likely to be fire-swept; protection is constantly becoming more efficient and therefore consideration may safely be given to the care of the growing timber crop.

The real forest problem in New Hampshire now is the present and future use of the enormous area of forested land, recently estimated to be 80-90% or more of the area of the state. What use is made of it will depend somewhat on the condition of the growing stock. Some areas should be parks permanently, but by far the greater proportion should be devoted to timber production by public and private owners. The quality of standing timber, especially in southern New Hampshire, has undergone a steady depreciation due to the policy since early colonial times of culling out the better trees and leaving the poorer. Not only have the residual stands of defective trees been left to grow and thus choke out more promising young trees, but there exists also a danger of degeneration from the unconscious selection of ill-shapen trees as seed-bearers to reproduce the forest. With each increase in the intensity of utilization, the stand left after logging has contained a higher proportion of culls, inferior species of trees, and individuals poorer in quality. If New Hampshire timberlands are to be restored to stands of easily salable, high-grade timber, a complete reversal of cutting policy is essential. Markets for low-grade wood must be developed and better trees left to grow wherever possible. Even where land has been cut virtually clean, or where young stands have developed without an overstory of hindering culls or "wolf trees," other factors have operated to lower the quality of the second growth. In white pine in southern New Hampshire the weevil has caused enormous financial loss indirectly by reducing the percentage of higher-grade lumber which can be sawed from crooked logs. Grazing while the stand was growing up has contributed to make the stands branchy and understocked.

A number of forest pests are now present, or threaten to invade our forests, which represent extremely important problems in forest protection. Insects are probably the most injurious pest, followed by fungi, fire and animals. Deprecia-

tion of quality caused by the white pine weevil has been mentioned; the balsam woolly aphid, larch casebearer, gypsy and browntail moths and forest tent caterpillars all cause damage. A sawfly which has destroyed much spruce in the Gaspé Peninsula and attacks all species of spruce, may possibly invade this state. The beech scale, an insect associated with the *Nectria* disease which has killed so much of the beech in the Maritime Provinces, has been found in a few points in the state, fortunately without the disease. The Dutch elm disease so far not reported from New Hampshire, is also carried by a small bark beetle.

Mention should be made of various injuries suffered by plantations. Where birds, deer, rabbits, mice, squirrels and porcupines are abundant damage is liable to be caused. White grubs and the *Pales* weevils are occasionally serious, and frost and dry winter winds kill terminal buds of a considerable number of trees during the first 20 winters. Where white pine blister rust has not been controlled, no white pine should be planted. While other pests cause large loss in white pine, blister rust, if uncontrolled, will eventually completely destroy white pine by killing off the young trees as they develop.

Research Program

Research projects were selected after a careful survey of forest problems which had arisen in the management of state forests and the State Forest Nursery in New Hampshire and on private lands. Nearly all the state lands were visited and studied in detail. Representatives of other agencies conducting forest research in the state were consulted with a view to avoiding duplication of effort and to co-operate on projects already under way. Finally, members of the Forestry Department and superintendents and foremen in the CCC camps and private timberland owners were urged to submit questions which they considered important to investigate. In this way it was hoped to devote effort in channels which would be of greatest value.

1. Market Study of Forest Products

The need for a long-time program of work in this field has been stressed in another part of this report. It is believed that such an investigation might include the following:

(a) An inventory of forest resources, with special attention to location and grades.

(b) A list, kept up-to-date, of the users of forest products, with the specifications and, if possible, the prices paid. Some information of this nature is now distributed by the Extension Service and this should be strengthened and supplemented.

(c) Development of new uses for species which have partly lost a market, such as pine box timber and little-used species.

(d) A study of how existing grades, specifications, etc., may be met by the use of other than the customary species.

(e) Development of markets for by-products of the forest.

To be of greatest value, a program of this sort should be carried on without interruption for a number of years, preferably permanently, and a man assigned to this work alone. He should work in close co-operation with the N. E. Lumbermen's Association, the Extension Service, the Division of Markets of the State Department of Agriculture, the Committee on Markets of the Society of American Foresters and the U. S. Forest Service, all of whom are carrying on work of this nature.

2. Stand Improvement in Second-Growth Stands

A large area in the state is now growing up with young timber. Since it became possible to carry on cultural work in such areas with the CCC and other relief crews opportunities for this work on State lands have been extended.

Twenty-six sample plots have been established and treated on state reservations, with the aid of CCC crews. The purpose of these plots has been study of stand improvement measures and methods of planting. In addition, several plots are maintained in co-operation with the U. S. Forest Service.

In the fall of 1934 an arrangement was made whereby a considerable number of permanent sample plots, established by the Brown Company on their lands between 1924 and 1929, will be maintained and measured by the state. The following subjects are being investigated especially:

(a) The prevalence of multiple hardwood sprouts on cut-over lands form one problem. They have a tendency to lean and bend outward from the center of the clump. This renders them less able to withstand the pressure of snow and ice; bark cankers and other fungi frequently cause extensive losses. With the growth distributed over a large number of stems, smaller sizes of timber are produced in a given time than if the root system served a single trunk with one symmetrical crown. Investigations are under way to determine how the removal of one or more stems from a clump causes rot to enter the remaining stems and how growth is affected. Indications so far are that most rots originate in the original stump. Several permanent plots have been established.

(b) Thinning crowded stands of trees which compete with one another on an almost even basis is one of the most neglected operations in our forests today, but one of the most difficult to apply profitably. In every case the rate of growth has been found to increase following thinning, but thinning can be justified financially only when the thinning operation has been accomplished without expense. Permanent sample plot studies are being continued.

(c) Weeding (i. e. cleaning out competing trees and shrubs in stands smaller than pole size) is frequently required to release plantations and valuable young natural growth from extermination by sprouts and weeds. The effect of varying degrees of cutting is being studied on several plots. Some of the older experiments indicate that the weeding was done too heavily and caused unproductive holes in the stand. Unless a weed species, such as gray birch can be marketed, weeding in young stands should be confined to freeing crop trees. Most young stands should be kept dense and weeded lightly at frequent intervals.

(d) Girdling undesirable and worthless trees in order to release trees of greater actual or potential value has come to be recognized as one of the most useful and profitable forestry measures. The areas must be carefully selected and in some cases the trees marked. Much further study is required and several plots have been laid out on state reservations. Remeasurements of plots established upwards of 10 years ago and observations of the results of girdling elsewhere may be summarized as follows:

1. Only such trees as are directly under or immediately adjacent to girdled trees can be counted on to show increased increment following girdling.
2. Suppressed trees must have, or develop, an adequate crown and leaf area in proportion to the size of the bole, if they are to respond to release. Occasionally it may be worthwhile to salvage spruce trees which might otherwise die, but girdling a hardwood near them will not result in increased growth of the spruce for many years if the crown is small in proportion to the size of the trunk.

Girdling is recommended only where:

- (a) trees to be girdled have no prospective value, and
- (b) valuable trees of at least near-merchantable size would be released by the girdling, or
- (c) damage would be caused by felling out of proportion to the value of the tree felled.

3. Reforestation

(a) *Seed Source.* Reliable information on results to be expected from planting various species is much needed. Furthermore, not only must the species be chosen which will grow well on a given site or otherwise best fulfill the objectives of the plantation, but the trees planted should originate from a race or strain suitable to the climate and soil. The origin of the seed cannot be overlooked. Although comparatively little is known of local races and variations in native trees, indications are that as great or greater differences exist as in exotic species commonly planted. It is of funda-

mental importance to forestry that this subject be investigated and a study of the effect of seed origin, therefore, constitutes one of the major projects.

In 1932 a one-acre plot was planted on the Casalis tract by the Northeastern Forest Experiment Station with Scotch pine stock grown from seed collected near Boonville, N. Y., from young stands which had been self-sown from older planted trees. The pine is apparently of a race well-adapted to this region and has produced straight, well-formed trees. In 1934 an additional two acres were set out, also by the Northeastern Forest Experiment Station, which is keeping individual records on 100 trees in each plot. Similar plots have been established on the Ponemah Tract in Amherst. Samples of the same seed were received in 1931 and sown at Berlin, N. H. Trees grown from this seed have been transferred to the Fox Research Forest and set out in the field and nursery. Several different origins of Scotch pine, Norway spruce and European larch are now represented in the nursery from seed received from foreign forest experiment stations and sown in June, 1934. It is hoped that eventually this stock may show what races of these species are best for planting in New Hampshire.

(b) *Planting Technique.* More definite information is needed on the spacing which will give the best results in different soils with various species; the seasons when planting can be done safely, and the methods used in planting. Experiments have been initiated to study all these factors.

(c) *Seed-spotting.* Direct seeding promises to be cheaper and preferable to planting under certain conditions. Methods are being worked out by a series of experiments which have been under way since 1927. Seed-spotting cannot yet be generally recommended, but in experimental work over 80% success was obtained in the dry spring and summer of 1934.

(d) *Planting of Hardwoods.* Work is planned in the spring of 1935 on the growing of basket willows in co-operation with other agencies, and experimentation with promis-

ing hybrid poplars developed in the N. Y. Botanical Garden and Oxford Paper Company.

(c) *Nursery Fertilizers.* It is still uncertain what the best fertilizer practice at the state nursery should be and experiments are planned with different fertilizers. Twenty-four plots were treated with different fertilizers at the State Nursery in the fall of 1934 and will be planted with transplants in the spring of 1935. Other plots will be treated at that time.

4. Disease and Insect Control

Investigation of tree pests will be chiefly in co-operation with specialists in these fields. It is not the intention to encourage inquiry on the subject of tree pests (largely shade tree pests) and an arrangement has been made to refer most inquiries to the Agricultural Experiment Station in Durham which is equipped and manned to supply authoritative information of this sort.

Active co-operation was maintained with the other agencies on a study of the balsam woolly aphid. Death of scattered trees and groups of balsam fir became very noticeable in the spring of 1933 throughout New England. An important cause, although not the only one, was an attack by a small plant louse. Surveys of damage were made in co-operation with Dr. H. J. MacAloney of the Bureau of Entomology and Plant Quarantine, stationed at the Northeastern Forest Experiment Station, and infested trees on some state reservations were cut and burned in connection with stand improvement work by various relief crews. The severe winter apparently killed a high percentage of the insects above snow line and new attack was less severe in 1934. A large amount of balsam timber has been destroyed indirectly by this insect.

No cases of the Dutch elm disease have yet been reported in New Hampshire but a number of suspicious trees were examined in 1934 in response to inquiry. Following a conference of representatives of the New England States in Boston on August 31, 1934, a New Hampshire Committee on Dutch elm disease was organized and a brief press bulletin

tin issued by the Experiment Station. Some educational work has been carried on and the outbreak of the disease in New York and New Jersey has been studied at first hand. More detailed scouting and study of possible carriers of the disease is planned for the season of 1935.

Research Facilities at Hillsboro

The location of the Fox Research Forest in Hillsboro is so far removed from any other center in the state that some arrangements for laboratory and library facilities are necessary. Accordingly, a laboratory room with north light has been finished and equipped with electric oven, autoclave, herbarium case and running water. A microscope, Jung microtome and analytical balance have been loaned to the station. There is ample storage space for collections and other material in the exhibit rooms in the barn. Through co-operative agreement, laboratory and library facilities at the University of N. H. and the N. H. Agricultural Experiment Station in Durham are available. Not only do the unusual variety of forest types and open land on the Fox Research Forest offer opportunity for investigation, but other state tracts, town forests, lands of the Society for the Protection of N. H. Forests, White Mt. National Forest and several private forests may also be used for forest investigation.

A start has been made in securing Government and State publications for a research library at Hillsboro. The library of the Forestry Department in Concord, the State Library, University of N. H. and Dartmouth College libraries may be consulted, and owing to the distance a working library at Hillsboro is essential to the equipment of a research station. Subscription to one periodical was paid from the Fox Fund during the past year and the Journal of Agricultural Research was received through the generosity of the U. S. Department of Agriculture. Contributions to the library are greatly needed.

Research Fellowships

In carrying out the provisions of the Fox Trust Fund it was decided that no better use could be made of funds for

research than by appropriating a part of the income each year for research fellowships. These are intended to serve the dual purpose of supporting an investigation which will be of immediate value to the state, and in giving advanced training to students. They are intended primarily for younger men and women completing graduate work who wish to carry on field or laboratory work either in connection with their University course, or in addition to it. No arrangements have been made with any institution for giving academic credit for such work, this being entirely at the discretion of the university.

The scope of research under the fellowships is to be kept as broad as possible, the only requirement being that the subject under investigation be in some way related to forestry and conservation in New Hampshire. The project is to be selected by the applicant for fellowship, subject to the approval of the Advisory Board charged with selection of candidates. The project should, however, be possible of completion within the period of the fellowship, in any case not to exceed one year. Besides technical forestry problems, subjects in allied fields of botany, zoology, economics, law, sociology, soil science, etc., may be selected.

Fellowships are open to both men and women who have completed at least three years work in a college of recognized standing and have satisfactory background to enable them to pursue with profit the subject selected by them. They need not have studied forestry. Holders of fellowships are expected to be in residence at Hillsboro, or in the field, as required by their project, for a total time of two months. It is not necessary that such residence be continuous, but may be distributed in two or more shorter periods at any time of the year, as required by the project. Appointments are made for a period of one year from June 1st. Fellowships may be renewed at the discretion of the Board. At present the fellowships carry a stipend of \$150.

An Advisory Board for passing on applications for fellowships and for co-ordinating research activities has been constituted as follows:

W. R. Brown, Chairman; J. H. Foster, State Forester; Prof. K. W. Woodward, Dept. of Forestry, University of N. H.; C. E. Behre, Director N. E. Forest Experiment Station; Prof. C. J. Lyon, Dartmouth College; and J. P. Miller, U. S. Biological Survey, Pillsbury Reservation, Mill Village, N. H. In addition to funds from the Fox Trust Fund, subscriptions from individuals and organizations in support of additional fellowships are being received.

The first appointment of a fellowship was made October 1, 1934 to Mr. George Parsons, a graduate of Cornell in Forestry, who is engaged in a study of the costs and effectiveness of forest improvement work, especially that carried on by CCC camps and other unemployment relief projects.

Co-operation with Other Agencies in Forest Research

Efforts are constantly being made to co-ordinate all research work being done at the Fox Research Forest as closely as possible with other institutions in order to avoid needless duplication. Thus, close relations are maintained with the University of New Hampshire and Agricultural Experiment Station; the Northeastern Forest Experiment Station and the Yale and Harvard Forests. Through membership of the forester on committees of the National Research Council, Council of the American Association for the Advancement of Science and Committees of other societies, contact is gained with national trends in scientific research. Through membership in the International Union of Forest Research Organizations, nearly 100 different lots of seed of certified origin have been received in exchange and sown in the nursery of the Fox Research Forest.

Development of the Fox Research and Demonstration Forest

One of the major purposes for which the trust fund was left was the development of the Fox Reservation in Hillsboro. Accordingly, it is planned to concentrate as much as possible the research work and demonstration projects there. First of all, the forest is being operated under a plan for

sustained timber production. It is hoped to publish the detailed management plan in the near future. The first steps taken have been improvement cuttings and thinnings. It is planned to cut through the entire area (except a grove of almost virgin beech and hemlock which will be reserved as a natural area) as soon as possible. This cutting will be light, and remove diseased and poorly formed trees reserving and freeing the best trees of future promise. During the past two seasons the following operations have been carried on:

(a) *Stumpage Sales.* Cordwood stumpage was offered to residents of Hillsboro who wished to cut wood for their own use and not for sale on a permit basis, making a charge of \$1 for the permit for up to 10 cords of green wood, and in addition, allowing dead and down wood to be removed free. All trees to be cut were marked by the resident forester and strict cutting regulations enforced. All money received was turned in to the forest improvement fund. About 200 cords were cut in this way. In 1934 cordwood permits have been let on a straight stumpage basis. Where the trees marked are scattered and a careful thinning must be made yielding red maple and gray birch, 25-40 cents per cord have been charged. Besides furnishing local residents with an opportunity to cut their wood, stumpage sales of this sort are a more useful demonstration to the private owner than where wood has been cut by a crew hired for the purpose. Stumpage sales are made at a profit, or at least at no expense and are thus within the reach of any woodland owner. A copy of the permit form by which stumpage is sold will be sent to interested woodland owners on request.

(b) *Crew Work.* During the winter of 1933-34 over 200 cords of fuelwood were cut by CWA crews. This wood was sawed up by machines on the yard and distributed to the needy in Hillsboro through the town officers. In the spring of 1934 this work was continued by unemployment relief crews, and some weeding and girdling done. CCC crews from the Pillsbury Camp have since covered 32.25 acres with improvement

cuttings, yielding 150 cords of cordwood, 14 cords peeled poplar and 7,761 bd. ft. saw logs.

(c) *Contract Work.* In the fall of 1934 an operation was started to cut a decadent stand of paper birch, the men being paid by the thousand and by the cord. A contract was made for the sale of the timber cut. Pine, oak and other hardwood logs will also be sold. All of these operations are practical demonstrations of marketing and careful records are kept of the costs.

Wood Transport.

At present all products are carried by sled or scoot to a public highway. Hauling is contracted by the day or on a piece basis. Eventually it is hoped to get truck trails built through the forest so that all logs and wood will be within easy twitching distance of a truck. About three-quarters mile of such truck road has been built by relief and CCC crews and several miles of sled road leveled.

Fire Protection.

So much of the forest is near town roads that it is fairly accessible to fire apparatus and men can be brought in promptly in case of fire. The roads themselves make excellent fire breaks. No fires have occurred on the forest in recent years. In the spring of 1934 three fire water holes were built and water impounded by three small dams which serve as water holes for fire protection as well as fish pools and for other recreational purposes. Fireplaces are provided at the six leantos and campfires are allowed in them only. A knapsack pump and fire tools are kept at the forest headquarters. An unmanned emergency lookout tower is maintained on the highest point of the forest, whence Pitcher, Crotched, Monadnock and Kearsarge lookouts are visible. The location of the forest has been shown these lookouts and they are especially watchful of the Fox Forest.

Reforestation.

The open land on the Fox Forest is being used for experiments in reforestation by planting and direct seeding. In

the fall of 1933 1,500 trees were planted by the station staff. In the spring of 1934 34,550 trees were planted by relief crews at no expense to the Fox Fund. Over 8,000 trees were also set out in the experimental nursery. In repeating the spring vs. fall planting experiment, 1,500 trees were set out by CCC crews in the fall of 1934. Small areas were also seed-spotted in the spring and fall of 1934. It is planned to continue reforestation of the open areas until the tract is stocked with trees.

Recreational Developments.

Six lean-to shelters with fireplaces have been constructed for the use of visitors who wish to picnic. About five miles of trail connect these shelters. All trails are marked with direction signs and paint spots in different colors. A small dam built along the highway has made possible a pond which has been used for swimming and skating. Across the pond, where cars may be parked, there is a sufficient space for overnight camping. During the past year the reservation has been visited and the shelters used by Boy and Girl Scouts and residents of Hillsboro.

Game Management.

The Fox Forest has been set aside as a Bird Sanctuary and Game Refuge for many years, and is at present inhabited by about eight ruffed grouse, a few rabbits and porcupines, muskrats and numerous smaller rodents. It is frequently visited by pheasants, foxes and occasionally by deer and bobcats. Some attempts have been made in the past to augment the natural supply of food plants by planting barberry and other berry fruits. During the winter grain has been distributed for feeding. The area is really too small and too cut-up by other ownerships to serve as a good game sanctuary. It would be highly desirable if adjoining owners would agree to co-operate in extending the boundaries of the refuge to include at least 1,000 acres. In any case, the game stand is at present very much less than should be carried by the area and can be increased only by a conscious effort to provide food, shelter, etc. Mere protection is not enough.

Arboretum and Botanical Garden.

Some work was started in 1934 on planting native plants in an area in the ravine where it is planned to develop a botanical garden of all the native plants of New Hampshire in their natural surroundings. The Fox Forest is well adapted for an arboretum and comparison of results with many species of trees, native and exotic.

Museum for Permanent Forestry Exhibits

The large barn at the forest headquarters is in process of conversion into a museum covering all branches of forestry. During the past year box stalls on the main floor of the barn have been fitted with shelves, whitewashed and a beginning made on accumulating exhibit material. The stalls are arranged to contain exhibits of insects, fungi, fire-fighting apparatus, collections of woods and botanical curiosities, work of birds and animals and samples of forest products. It is hoped the latter exhibit may become a showroom for the wood-using industries of the state. Other plans include establishment of a miniature growing forest on the grounds.

Annual Field Day.

The First Annual Field day was held on the forest August 25, 1934 and was attended by about 150 persons. An excursion through the forest was held in the forenoon and another in the afternoon. Scenes of forestry operations during the past year were visited and demonstrations given of weeding, pruning and seed-spotting. About 75 people traversed the route on each excursion. At noon a picnic lunch took place on the lawn at the headquarters and short addresses were given by the State Forester and others.

The Forest is open to the public at all times and it has been visited by many foresters and others during the past year. Over 250 persons have registered in the guest book during the year.

Demonstration and Educational Work Outside the Forest

The Fox Research Forest was represented by an exhibit at the Hopkinton County Fair in September, 1934, featuring the importance of knowing the source and quality of forest tree seeds. Several lectures have been given by the resident forester before various clubs, and the N. H. Academy of Science. He has also co-operated with the American Forestry Association, the Society for the Protection of N. H. Forests and the Extension Service in conducting excursions and meetings. During the fall of 1933 lectures were given at all the State CCC camps and assistance was given in organizing the forestry courses at the camps. During the fall and winter 1934-35 lectures are to be given at the University of New Hampshire.

Other Activities.

Much time was given in 1933-34 to assisting the superintendents and foremen of CCC camps in planning and carrying out intermediate cuttings and planting. During this period the resident forester acted as supervisor of CWA crews and in the spring of 1934 of unemployment relief crews under the State forestry emergency program.

STATE APPROPRIATION ITEMS

This is a statement of department appropriation items. A detailed financial statement of appropriations and revenues, special funds, and State funds available to this department for unemployment relief are contained in the reports of the State Comptroller and State Treasurer.

JULY 1, 1932 — JUNE 30, 1933

	<i>Appropriation</i>	<i>Expenditure</i>	<i>Reserved for Bills Payable</i>
Administration	\$16,250.00	\$15,298.65	.....
Nursery	10,500.00	10,499.99	.....
Reforestation	3,500.00	3,491.37	.....
District Chiefs	7,500.00	7,500.00	.....
Lookout Stations	10,000.00	10,000.00	.....
White Pine Blister Rust.....	17,500.00	16,245.26	.....
Maintenance of Public Land..	2,000.00	2,000.00	.....
Conferences	1,000.00	818.56	\$119.85
Prevention of Fires.....	3,000.00	2,999.99	.....
Forest Fire Bills to Towns....	17,000.00	15,368.03	1,631.97
Forest Fire Equipment.....	1,000.00	999.11	.....
Total	\$89,250.00	\$85,220.96	\$1,751.82

JUNE 1, 1933 — JUNE 30, 1934

	<i>Appropriation</i>	<i>Expenditure</i>	<i>Reserved for Bills Payable</i>
Administration	\$15,448.98	\$15,448.98	.....
Nursery	6,998.62	6,976.15	.....
Reforestation	1,375.00	1,339.82	.....
District Chiefs	7,066.50	6,828.10	\$125.00
Lookout Stations	9,965.00	9,899.06	65.94
Prevention	2,950.00	2,923.44	25.00
Forest Fire Bills to Towns....	7,500.00	4,646.99	1,738.82
White Pine Blister Rust.....	4,865.00	4,841.31	.....
Forest fire personal injury ...	50.00	50.00	.....
Forest fire equipment	1,000.00	990.00	.....
Recreational development	4,950.00	4,384.52	559.67
Purchase of land in Tamworth	6,500.00	6,500.00	.....
Total	\$68,669.10	\$64,828.37	\$2,514.43