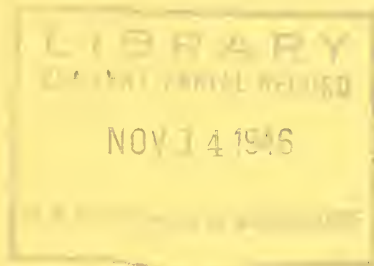


Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

Anthracite Survey Paper No. 9

May 1, 1946



THE FOREST SITUATION IN SCHUYLKILL AND CARBON COUNTIES
PENNSYLVANIA



NORTHEASTERN FOREST EXPERIMENT STATION

NORTHEASTERN FOREST EXPERIMENT STATION

Philadelphia, Pa.

V. L. Harper, Director

* * * *

DIVISION OF FOREST ECONOMICS

Frank A. Ineson, Chief

Anthracite Forest Survey

Miles J. Ferree, Forester

This is the third of a series of seven brief reports on the forest condition in the counties of the Anthracite Forest Region. This region includes 15 counties shown on the map on the back of this publication, which contain or surround the hard-coal deposits of Pennsylvania. Because of basic similarities, Schuylkill and Carbon Counties are treated together. The purpose is to present tabular data from the Anthracite Forest Survey for local use, together with enough general information about the two counties to make the forest situation understandable. Forest areas and present condition of the forest were determined through interpretation of aerial photographs, and the distribution of the major forest types was ascertained largely by reconnaissance. Data on species, size-classes, volume, and growth applicable to the several forest types and condition classes were collected by detailed field surveys.

Acknowledgment is made to John A. Buttrick and Donald F. Robinson for aid in compiling and writing the report, and to Robert Bartlett for preparation of charts and maps.

FOREST SITUATION IN SCHUYLKILL AND CARBON COUNTIES

PENNSYLVANIA

CONTENTS

| | |
|----------------------------|----|
| General description | 1 |
| Transportation | 2 |
| Population | 2 |
| Occupations | 2 |
| Forest description | 5 |
| Forest area | 5 |
| Forest types | 7 |
| Forest condition | 7 |
| Timber volume | 9 |
| Forest growth | 12 |
| Forest products industries | 12 |
| Forest land ownership | 13 |
| Outlook in brief | 13 |
| Appendix | 41 |

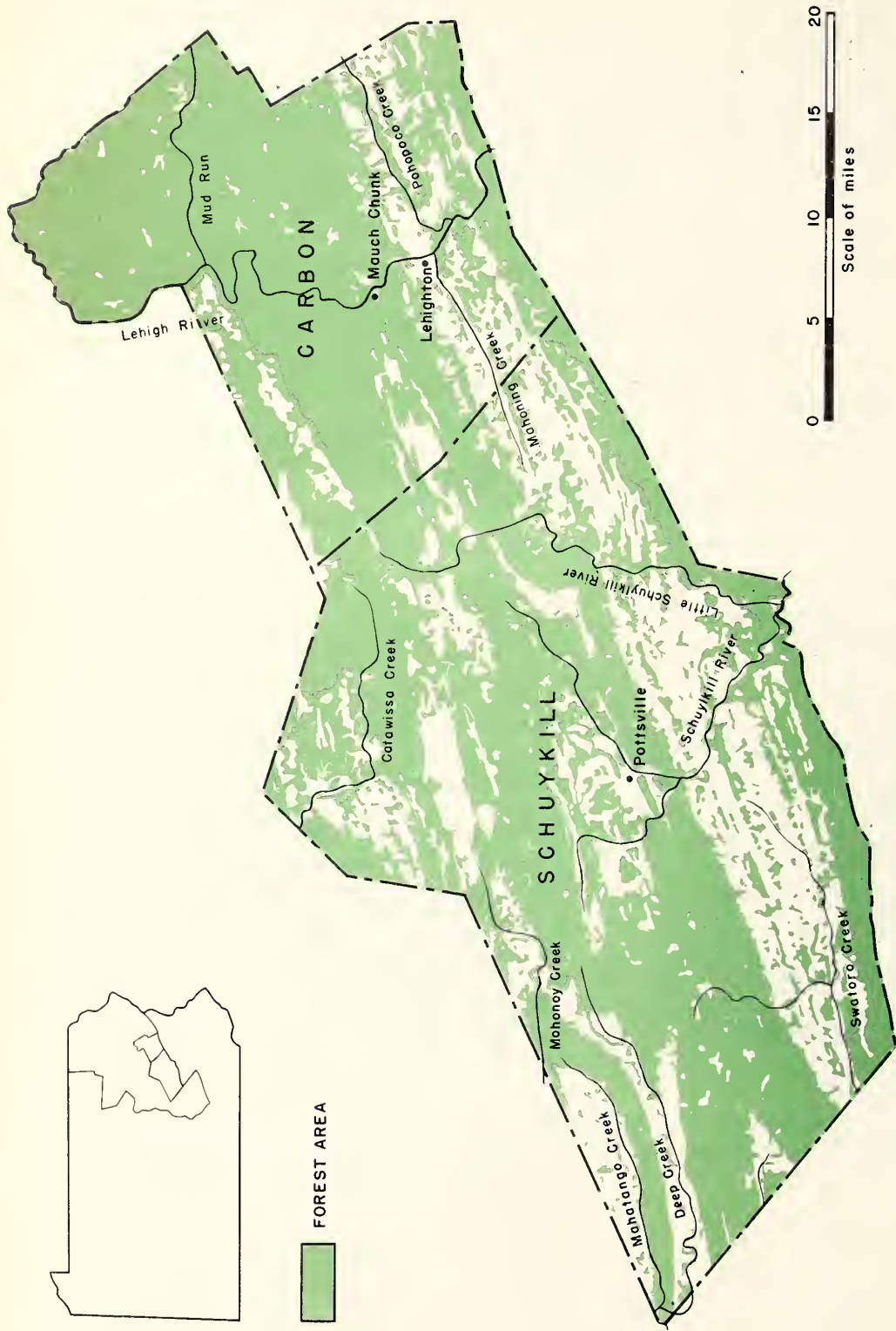


FIGURE 1. - FOREST AREA IN SCHUYLKILL & CARBON COUNTIES OF PENNSYLVANIA

THE FOREST SITUATION IN SCHUYLKILL AND CARBON COUNTIES

Schuykill and Carbon Counties include the most devastated forests of the Anthracite Region. Mine waste banks and strippings, severe erosion, scarcity of merchantable timber, and large areas of scrub oak are characteristic of much of the area of these two counties. On the other hand, there is considerable good agricultural land and many acres of potentially-productive forest.

General Description

Schuykill and Carbon Counties are made up of two distinct areas. The northern two-thirds is ridge country. The southern third is an uneven valley, spotted with hills and ridges, lying between Blue Mountain and the highlands to the north. The total area of the two counties is 1188 square miles or 760,320 acres.

The ridge and valley country in the north, which rises to a height of over 2200 feet in the northeast portion of Carbon County, is like a series of long fingers extending in a southwesterly direction from the Pocono highlands of Monroe County. The high country in Carbon County is covered with virtually unbroken forest land, most of it in relatively poor condition. From western Carbon to the western boundary of Schuykill the ridges are underlain with tilted veins of coal. Parts of the eastern and western middle coal fields and virtually all of the southern field lie within these two counties. Sections in northern and northwestern Schuykill, a narrow strip of hill and valley country that extends from the Lehigh River at Rockport to a point a few miles south of Mahanoy City, and the Blue Mountain Valley are largely devoted to farming, with here and there a manufacturing town and many small tracts of forest.

Most of the drainage of these counties is by short creeks running northeast or southwest into two southward-flowing rivers that cut their way through the ridges and Blue Mountain, and flow south and east to the Delaware. The easternmost of these rivers, the Lehigh, which drains Carbon County, forms the northeast boundary of that county and then swings in a wide arc to the south, carving out a sharp, deep, twisting gorge in which landslides and floods are frequent. Much of Schuykill County is drained by various branches of the Schuykill River. Northern and western Schuykill County is drained by the upper courses of creeks flowing to the Susquehanna, the most important being the Swatara in the southwest and the Catawissa in the north.

Transportation

Industrial transportation in this region was at first by water. In 1827-1829 a canal was built for transporting coal along the Lehigh River from Mauch Chunk to Easton. Later many short railway lines were built throughout the coal-field area. At the present time, except in the northern part of Carbon County, where there are no railways and but few roads, transportation facilities are good. The principal railroad is the Reading, with service to the East, West, and South. The Pennsylvania crosses Schuylkill County. The mainlines of the New Jersey Central and Lehigh Valley Railroads follow up the Lehigh River, and branches serve parts of Schuylkill. Freight service is excellent; passenger service, only fair. There are also over 800 miles of improved State highway and many miles of rural roads. Bus lines provide passenger service to all important urban centers throughout the region.

Population

The population of the two counties in 1940 was 290,066, a loss of 8819 since 1930, when this region achieved its maximum population. The greatest proportion of this number is urban. Pottsville, the county seat of Schuylkill County, is a city of 24,530. Three boroughs in Schuylkill County have more than 10,000 inhabitants each, Shenandoah, Mahanoy City, and Tamaqua. There are eleven other boroughs of more than 5000 and many smaller ones. Less than 8 percent of the total population (16,222 persons) lives on farms, three quarters of them in Schuylkill County.

Occupations

The principal occupation in these two counties is the mining of anthracite. In 1940 there were 47 mines with a total employment of nearly 21,000 and an output of 13,400,000 tons valued at \$51,896,300. In recent years strip-mining and the reclamation of coal from waste banks have supplemented deep mining to a considerable degree. In 1943 one quarter of the total production was by strip-mining and one quarter by bank reclamation.

The commercial mining of coal in this area goes back to 1791, when the Lehigh Navigation Coal Company was founded. At first, mining was carried on in a small way only. But with the building of the Lehigh River Canal, large-scale transportation of coal from the eastern middle field was made possible. For the next ninety years the production of coal increased steadily, far surpassing agriculture and lumbering as a means of livelihood, and bringing in labor in large quantities. The many congested settlements in western Carbon and throughout the central and northern parts of Schuylkill bear testimony to the influence of the mining industry on the whole social and economic life of these two counties.

Coal production reached its peak in 1917. During the thirty years since then the history of these counties, and especially of Schuylkill, has been characterized by the decline of this industry. As the years have gone by, more and more people, dependent on the mines for jobs, have found themselves without work. In 1940, 35,000 workers, 31 percent of the total labor force, were jobless; and though this unemployment was partly due to the general economic depression, the decline in the mining industry was nevertheless the chief cause, either directly or indirectly, of the situation.

Wherever a heavy industry, such as mining, is established, the textile industry is likely to be found also. The comparative lightness of the work and the comparatively low market value of the products of this industry have regularly resulted in its employing a high percentage of women. It has therefore established itself where it could draw for its labor personnel on the wives and daughters of men otherwise employed. In Carbon and to a greater degree in Schuylkill County this has taken place. In 1940 there were 84 textile factories employing upwards of 10,000 persons, with an output valued at \$20,823,700.

One other manufacturing industry of importance is established in this section, the metal products industry. There are a number of small iron and steel-using concerns in Weatherly and at various points in Schuylkill County. One large concern, a zinc company with two plants in Palmerton, provides the bulk of the employment. Altogether, in 1940, 18 metal manufacturing plants were in operation, with a total employment of nearly 3,700 and an output valued at \$16,555,600.

The total manufacturing output for Schuylkill and Carbon Counties amounted to \$61,690,900 in 1940. Three hundred and seventy plants were in operation and 19,246 persons employed^{1/}.

In the last five years, mining and the various manufacturing industries have expanded production. Between 1940 and 1942 the coal output increased from thirteen million to sixteen million tons. During the same period the output of the manufacturing industries increased in value by nearly 50 percent. The number employed has also been increased to some extent, the greatest increase being in the metal manufacturing industry. Schuylkill and Carbon Counties are the only sections of the Anthracite Region where employment in mining as well as output of coal increased between 1940 and 1942.

^{1/} Tenth Industrial Directory of the Commonwealth of Pennsylvania; Dept. of Industrial Affairs; compiled by the Bureau of Statistics, Harrisburg 1941.

The earliest development of these counties was agricultural. During the eighteenth century the land was cleared and farms established in the Blue Mountain Valley, and at a somewhat later date in the fertile creek valleys of northern and western Schuylkill. To this day farming remains the principal occupation of these sections. In 1940 only 16 percent of the land area (124,000 acres) was in cropland. On the whole, however, this land is average or better, and the Hegin Valley in northwest Schuylkill prides itself on its superior farmland. Poultry, livestock, grain, hay, and vegetables are the chief products. Altogether there are about 2,700 farms, and the annual farm income totals about \$5,300,000 (1939). In addition, a number of persons derive a seasonal income from picking the blueberries that grow in the ridge country and are especially plentiful in the northern portion of Carbon County. Also much of the better timber is in farm woodlands; and this provides additional income to the farmers.

OCCUPATIONS OF POPULATION: 2/

| | | | |
|----------------------------|-------|---------|-----|
| Total population | | 290,066 | |
| Not in labor force | | 177,080 | 61% |
| In labor force | | 112,986 | 39% |
| Unemployed | | 35,315 | 31% |
| Employed | | 77,671 | 69% |
| Trade and service | | 27,274 | 35% |
| Coal mining | | 23,491 | 30% |
| Manufacturing | | | |
| Metal | 3169) | | |
| Textile | 8367) | | |
| Food | 1221) | 15,622 | 20% |
| Other | 2865) | | |
| Transportation | | 5,199 | 7% |
| Agriculture | | 3,267 | 4% |
| Construction | | 2,221 | 3% |
| Forest products industries | | | |
| Forestry | 33) | | |
| Logging | 126) | | |
| Milling | 151) | 505 | 1% |
| Wood manufacture | 58) | | |
| Paper manufacture | 137) | | |
| Quarrying and other mining | | 92 | * |

*negligible

2/ This table, based on the U. S. Census for 1940, indicates the primary occupations of the residents of Schuylkill and Carbon Counties. The

Forest Description

Settlers began cutting off the forests for farmland in the valleys in the latter part of the eighteenth century. In the middle of the nineteenth, commercial lumbering began. The considerable quantities of white pine were first removed, then hemlock was felled for tanning bark, and finally hardwoods for lumber. After 1900 the rapid expansion of mining brought about an increasing demand for mine timbers, and second- and even third-growth stands have been clear-cut to meet this demand.

Forest area









Seventy-two percent of the gross area of Schuylkill and Carbon Counties is forested (fig. 1)^{3/}. Northern Carbon is almost entirely covered with forest, and the coal region of Schuylkill and eastern Carbon is largely in forest also. In the Blue Mountain valley and the valleys in the northern and western sections of Schuylkill are numerous scattered tracts, many of them farm woodlands. Over 95 percent of the forest land in the two counties is in tracts of 50 acres or larger^{4/}.

| | <u>SCHULYKILL</u> | | <u>CARBON</u> | |
|-------------|-------------------|----------------|---------------|----------------|
| | <u>Acres</u> | <u>Percent</u> | <u>Acres</u> | <u>Percent</u> |
| Forest land | 344,000 | 69 | 204,900 | 79 |
| Nonforest | 157,900 | 31 | 55,100 | 21 |
| Gross area | 501,900 | 100 | 260,000 | 100 |

figures given in the text, on the other hand, are based on the employment provided by industries located within these counties. Discrepancies are due to the fact that many people live in one area and work in another.

3/ Maps showing the location of all forest tracts are available in a scale of 1" = 1 mile for each county; similar map showing forest condition is also available for Schuylkill County. These maps may be ordered through the Northeastern Forest Experiment Station, 614 Bankers Securities Building, Philadelphia 7, Pa. A postal or express money order, draft, or check made out to the Treasurer of the United States, covering the full amount, should accompany the order. Prints will be forwarded from the Forest Service, Division of Engineering in Washington, D. C. Each map will cost: Schuylkill County \$0.68, Carbon County \$0.40.

4/ For detailed tables see Appendix.

-  SUGAR MAPLE - BEECH - YELLOW BIRCH
-  ASPEN - GRAY BIRCH - PIN CHERRY
-  WHITE PINE - WHITE OAK - RED OAK
-  WHITE PINE - HEMLOCK
-  SCRUB OAK
-  CHESTNUT OAK
-  RED OAK - BLACK OAK - WHITE OAK
-  LAKES

Type symbols indicate areas where the given types predominate, but the frequent local occurrence of other types is not precluded.

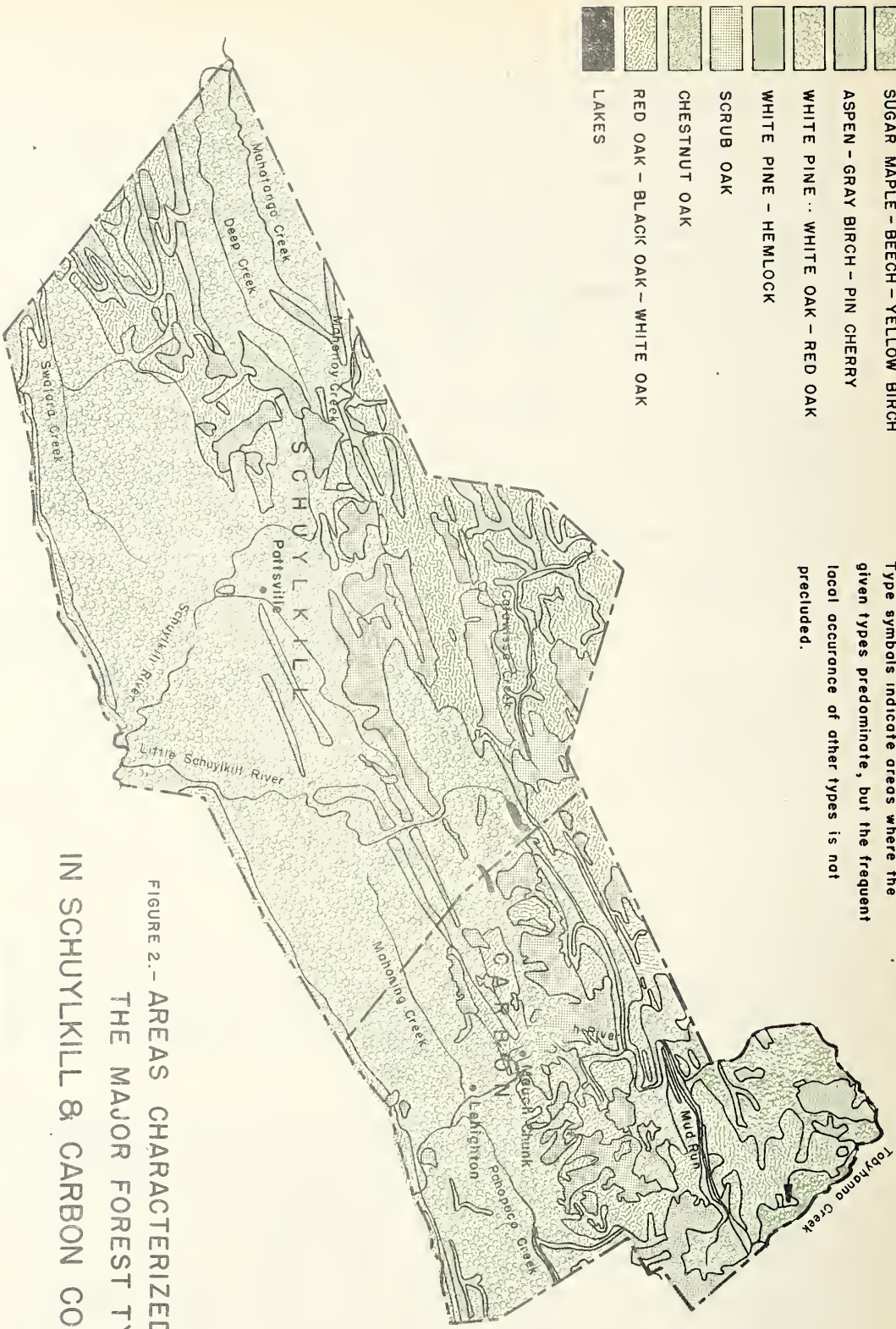


FIGURE 2.- AREAS CHARACTERIZED BY THE MAJOR FOREST TYPES IN SCHUYLKILL & CARBON COUNTIES



Forest types

The natural forest cover of the bulk of this region is the white pine - white oak - red oak type, with white pine and hemlock in the creek bottoms (fig. 2). As the land becomes higher and poorer, these types give way to the red oak - black oak - white oak type, to chestnut oak, and finally to scrub oak. It is probable that many of the high open hilltops have always been in scrub oak, but the extent of that type has been greatly increased by fire. In the northern part of Carbon County there is a small area of northern hardwoods (sugar maple - beech - yellow birch), a large proportion of which has been reduced by fire to the aspen - gray birch and pin cherry.

Forest condition

On the whole the forests of this area are in extremely poor condition. Lumbering for saw timber and to meet the demands of the mining industry have between them cut off all the virgin timber and considerable quantities of second- and even third-growth stock. Furthermore this lumbering has been a clear-cutting process and in many instances has been followed by devastating fires. In 1923, for example, 13 percent of the total area of Schuylkill County was burnt over. As a result, these forests contain only 140 million cubic feet of standing timber--270 cubic feet to the acre on the average--and less than 59 million board feet of merchantable saw timber. Nearly a sixth of the entire forest area is in scrub oak, and a large proportion of the rest is stocked with timber too young to be as yet of commercial value. Moreover, much of the land surface is scarred with strippings and piled with waste banks where the dominant industry of mining has taken its toll. Altogether nearly 90 percent of the forest land is unmerchantable (fig. 3)^{2/}.

5/ The condition classes recognized are: 1. Saw-timber stands: stands of 10 acres or larger, each acre of which contains at least 2000 board feet of saw timber. 2. Pole-timber stands: stands of 10 acres or larger, each acre of which contains a minimum volume of approximately 5 standard cords in trees 5.0 inches diameter breast high (hereafter denoted by the initials d.b.h.) and larger, and less than 2000 board feet of saw timber. 3. Unmerchantable stands: areas of forest land which contain less than the minimum volume for pole-timber stands, plus stands of saw timber and pole timber of less than 10 acres in extent, whether isolated tracts or stands within larger forest areas.

SCHUYLKILL COUNTY

MERCHANTABLE STANDS

SAW-TIMBER

POLE-TIMBER

UNMERCHANTABLE STANDS

SAW-TIMBER LESS THAN 10 ACRES

POLE-TIMBER LESS THAN 10 ACRES

YOUNG GROWTH

SCRUB OAK

50,000 100,000 150,000 200,000 250,000

ACRES

CARBON COUNTY

MERCHANTABLE STANDS

SAW-TIMBER

POLE-TIMBER

UNMERCHANTABLE STANDS

SAW-TIMBER LESS THAN 10 ACRES

POLE-TIMBER LESS THAN 10 ACRES

YOUNG GROWTH

SCRUB OAK-ASPEN

50,000 100,000 150,000 200,000 250,000

ACRES

Figure 3.- THE CONDITION OF THE FOREST

Timber volume

The volume of saw timber and the green weight of all timber are shown in the following table^{6/}:

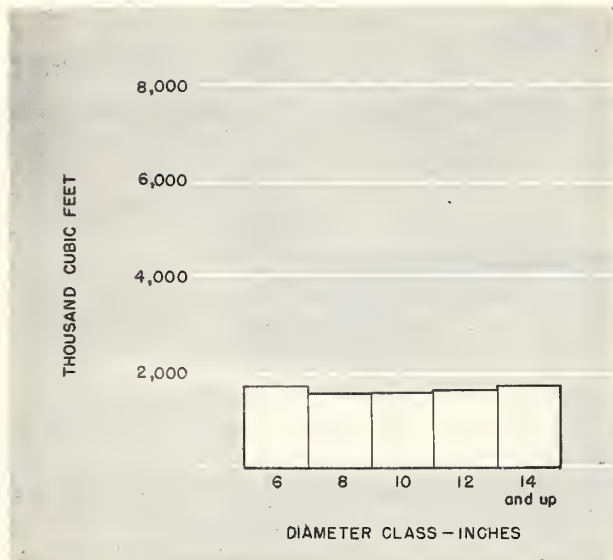
| | <u>SCHUYLKILL</u> | | <u>CARBON</u> | |
|-----------------------|-------------------|---------------------|-------------------|---------------------|
| | <u>Saw timber</u> | <u>Total</u> | <u>Saw timber</u> | <u>Total</u> |
| | | <u>green weight</u> | | <u>green weight</u> |
| | <u>M bd.ft.</u> | <u>Tons</u> | <u>M bd.ft.</u> | <u>Tons</u> |
| Saw-timber stands | 17,400 | 147,000 | 41,400 | 394,900 |
| Pole-timber stands | 16,200 | 215,800 | 25,300 | 571,800 |
| Unmerchantable stands | 67,200 | 1,434,800 | 30,900 | 887,700 |
| Total | 100,800 | 1,797,600 | 97,600 | 1,854,400 |

The distribution of the cubic-foot volume in the merchantable pole-timber stands by tree size may be seen in figure 4. The oaks account for well over half the green weight of all timber. In Schuylkill County the conifers are next in importance. In Carbon the other hardwoods, such as red maple, black birch, yellow poplar, and white ash, rank second.

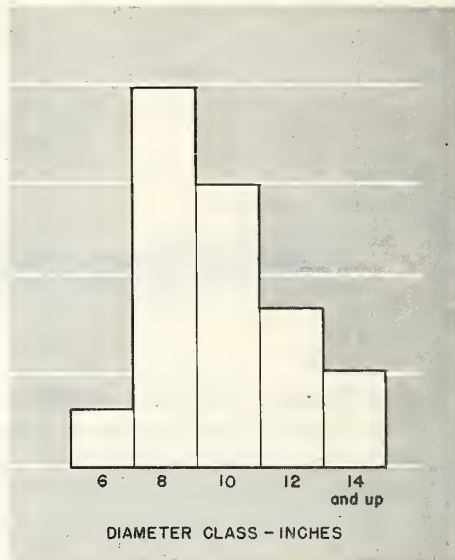
| | <u>SCHUYLKILL</u> | | <u>CARBON</u> | |
|----------------------------|-------------------|----------------|----------------|----------------|
| | <u>Tons</u> | <u>Percent</u> | <u>Tons</u> | <u>Percent</u> |
| Conifers | 61,900 | 29 | 99,100 | 17 |
| Oaks, hickory, sugar maple | 128,800 | 60 | 329,900 | 58 |
| Other hardwoods | 25,100 | 11 | 142,800 | 25 |
| Total | 215,800 | 100 | 571,800 | 100 |

6/ Saw-timber volume is the net board foot of sawlog-size material in conifers 9.0 inches d.b.h. and larger, plus the net volume of sawlog-size material in hardwoods 11 inches d.b.h. and larger. Board foot volumes were based on the International 1/4" log rule, which closely approximates green lumber tally. Deductions were made for cull. Total green weight is the weight of all trees 5.0 inches and larger, including bark and the tops and limbs to a 4-inch diameter. This was computed in cubic feet and converted to tons (green weight) by the application of cubic foot-per-ton factors, varying by species groups and averaging about 35 cubic feet per ton.

Figure 4.-CUBIC FOOT VOLUME IN MERCHANTABLE POLE-TIMBER STANDS BY DIAMETER CLASSES-ALL SPECIES



SCHUYLKILL COUNTY

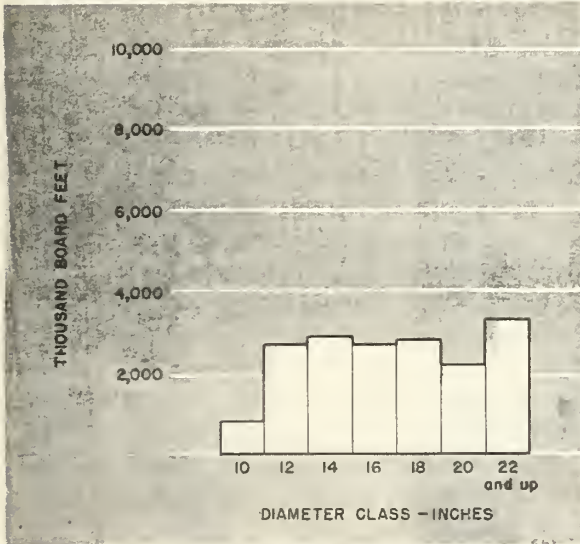


CARBON COUNTY

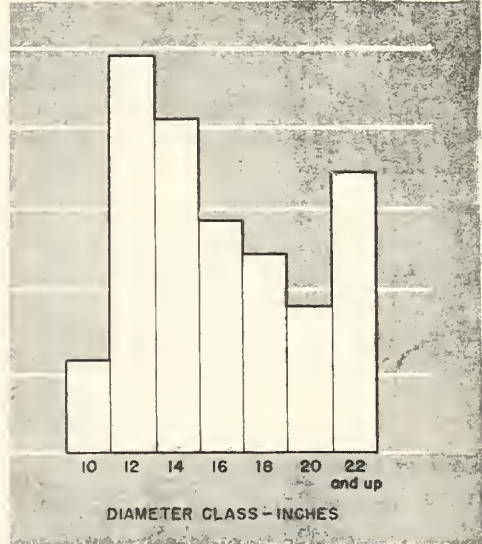
Over 70 percent of the area in saw-timber stands is located in Carbon County, and in both counties this area is largely in young trees. Over half of the saw-timber stands average less than 4,000 board feet to the acre:

| Thousand Board Feet per Acre | SCHUYLKILL | | CARBON | |
|------------------------------|------------|----------|--------|----------|
| | Acres | M bd.ft. | Acres | M bd.ft. |
| 8 and more | 600 | 6,200 | 1,200 | 11,500 |
| 6 to 8 | 300 | 2,200 | 1,300 | 7,900 |
| 4 to 6 | 1,000 | 4,500 | 2,000 | 8,500 |
| 2 to 4 | 1,900 | 4,500 | 5,100 | 13,500 |
| Total | 3,800 | 17,400 | 9,600 | 41,400 |

Figure 5.- BOARD FOOT VOLUME IN MERCHANTABLE SAW-TIMBER STANDS BY DIAMETER CLASSES - ALL SPECIES.



SCHUYLKILL COUNTY



CARBON COUNTY

The species distribution in the saw-timber stands is quite different from that in the pole-timber stands. Nearly half the saw-timber volume in these stands is in conifers, and the oaks account for only about a third:

| | <u>SCHUYLKILL</u> | | <u>CARBON</u> | |
|----------------------------|-------------------|----------------|-----------------|----------------|
| | <u>M bd.ft.</u> | <u>Percent</u> | <u>M bd.ft.</u> | <u>Percent</u> |
| Conifers | 8,500 | 49 | 19,300 | 47 |
| Oaks, hickory, sugar maple | 6,600 | 38 | 13,700 | 33 |
| Other hardwoods | <u>2,300</u> | <u>13</u> | <u>8,400</u> | <u>20</u> |
| Total | 17,400 | 100 | 41,400 | 100 |

The distribution of this volume in saw-timber stands by tree size may be seen in figure 5.

Current forest growth

The following tables show the total timber growth and the saw-timber growth of the different condition classes in the two counties:

| 1943 | | |
|----------------------------|-------------------|---------------|
| <u>Total timber growth</u> | | |
| | <u>SCHUYLKILL</u> | <u>CARBON</u> |
| | M cu.ft. | M cu.ft. |
| Saw-timber stands | 202 | 514 |
| Pole-timber stands | 473 | 1,211 |
| Unmerchantable stands | <u>4,497</u> | <u>2,590</u> |
| Total timber growth | 5,172 | 4,315 |
| <u>Saw-timber growth</u> | | |
| | M bd.ft. | M bd.ft. |
| Saw-timber stands | 730 | 1,810 |
| Pole-timber stands | 1,240 | 2,000 |
| Unmerchantable stands | <u>4,560</u> | <u>2,070</u> |
| Total saw-timber growth | 6,530 | 5,880 |

Forest Products Industries

Although at one time lumbering was a leading industry, at present it is relatively unimportant. In 1942 there were 36 active sawmills, which produced a total of about 6.5 million board feet of lumber. The number of these mills by production classes is shown in the following table:

| <u>Production class</u> | <u>SCHUYLKILL</u> | <u>CARBON</u> |
|-------------------------|------------------------|---------------|
| Thousand board feet | <u>Number of mills</u> | |
| Idle | 7 | 1 |
| 1 to 50 | 12 | 3 |
| 50 to 500 | 13 | 1 |
| 500 to 1000 | 2 | 1 |
| Over 1000 | <u>2</u> | <u>0</u> |
| Total | 36 | 6 |

The principal wood requirement of Schuylkill and Carbon Counties is for mine timbers, and some cutting of mine timbers is being done. The local timber resource is, however, so greatly reduced that only a very small percentage of the requirements can be met within the two counties.

Wood-using manufactures are few. There are 11 planing mills employing a total of 29 persons, 4 furniture factories with 11 employees altogether, and 4 other small plants with a total employment of 10 persons.

Forest Land Ownership

About 16 percent of the forest land in Schuylkill and Carbon Counties is publicly owned. The Federal Government owns a tract near White Haven, the Hickory Run recreational area, which is to be turned over to the State for administration after its development has been completed. The State Game Commission controls several sizeable tracts in northern Carbon and scattered areas in Schuylkill. The State also owns a small plot in eastern Carbon which is administered by the Department of Forests and Waters. The greater part of the public forest land in Schuylkill and Carbon Counties belongs to the counties or is community-owned. Nineteen percent of the total forest area belongs to coal companies, most of it in Schuylkill County. Of the rest, 4 percent is owned by water companies, 10 percent by farmers, and about 51 percent by other private owners. The ownership distribution of the forest land in the two counties is as follows:

| | <u>SCHUYLKILL</u> | <u>CARBON</u> |
|---|-------------------|----------------|
| | <u>Acres</u> | <u>Acres</u> |
| Public ownership | | |
| Federal | -- | 13,400 |
| State (Department of Forests and Waters) | -- | 600 |
| State Game Commission | 9,600 | 3,100 |
| County | 28,700 | 12,200 |
| Community | <u>14,200</u> | <u>--</u> |
| Total public ownership | 52,500 | 35,300 |
| Private ownership | | |
| Coal companies | 101,100 | 5,600 |
| Water companies | 16,900 | 4,800 |
| Farmers | 37,400 | 18,300 |
| Others | <u>136,100</u> | <u>140,900</u> |
| Total private ownership | 291,500 | 169,600 |

Outlook in Brief

The depleted state of the forests in these two counties is largely due to their economic importance. The mining industry has needed large quantities of timber, much of it in small sizes. As a consequence the

forests are usually stripped as soon as they reach mine-timber size, and so, seldom have a chance to grow into saw-timber. From the point of view of maximum returns this is wasteful management. Much of the country naturally bears a considerable proportion of white pine which, if allowed to mature, makes valuable lumber. And there are many specialized uses for mature oak--furniture, flooring, cooperage--from which the returns are much higher than from lagging and mine timbers.

The principal measures required to attain productive forests are:

1. Increased prevention and control of forest fires is prerequisite to any attempt at forest improvement in this area. The State Department of Forests and Waters has made some progress in its efforts to control forest fires in this area but fires still burn over far too large an acreage annually. Additional access roads and equipment are needed. A well-planned educational program would do much to win the support of the populace, without which fire-prevention programs are useless. And an increased fire detection and control organization, possibly made up of volunteers, that could be active during periods of high hazard in the spring and fall would make possible the reduction of fire damage to a minimum.

2. Forest management practices must be greatly improved. Thinnings and improvement cuttings can produce a considerable proportion of the mine-timber requirements. The better trees, both pines and hardwoods, would thus have a chance to grow into valuable timber. The practice of clear cutting the forest stands as soon as they will provide mine timbers should be stopped.

3. Planting will hasten the development of productive forests. So depleted are the forests in this area that restoration of them by natural means could profitably be supplemented by planting. In particular the proportion of white pine could be increased in this way. And such of the scrub oak stands as are on good sites might also be planted to hasten their restoration to productivity. This planting, however, should not be indiscriminate. Many acres in eastern Schuylkill and central Carbon are probably too poor sites to justify the expense of planting them.

Planting mine waste banks and strippings should also be considered. This is not in the strictest sense a forest-improvement measure. Commercial timber will not grow for many years to come on these areas. Nevertheless, the erosion of silt into streams and the blowing of dust from these banks have such detrimental effects that the stabilization of them by planting is well worth careful consideration. Steps are being taken to reduce the silting of coal into the Schuylkill River.

Planting for watershed protection, especially in the Lehigh Valley, would also be a worthwhile item on the forest agenda. The speed of flood run-off and, in the more precipitous areas, the danger of

landslides and erosion would be lessened if there were adequate forest cover. The Lehigh Valley Flood Control Council has included forestry measures as an important part of its flood-control program.

4. Public ownership should gradually be increased. Large areas of forest land in these two counties, especially in the coal fields, are too poor in site quality to justify continued private ownership. Restoration of depleted forests requires many years, thus making private ownership unattractive. The coal companies are primarily interested in the subsurface coal resources. The surface resources have suffered the consequences and it is doubtful if these can be restored to full productivity unless they are brought under public administration. Public agencies can develop these forest areas, first, for game production, second, for recreation, and, finally, for timber production. Such ownership and development will assure maintenance of excellent watersheds at the headwaters of streams.

APPENDI

Tables 1 to 9 - Schuylkill County

Tables 1 to 9 - Carbon County

SCHUYLKILL COUNTY

Table 1.--Land use

| Land use | Area <u>Acres</u> | Proportion of class <u>Percent</u> | Proportion of gross area <u>Percent</u> |
|---------------------------|----------------------|--|---|
| Forest <u>1/</u> | | | |
| Tracts less than 10 acres | 4,000 | 1.2 | 0.8 |
| Tracts 10 up to 50 acres | 10,000 | 2.9 | 2.0 |
| Tracts 50 acres and over | 330,000 | 95.9 | 65.7 |
| All forest land | 344,000 | 100.0 | 68.5 |
| Nonforest | | | |
| Cropland <u>2/</u> | 95,300 | 60.3 | 19.0 |
| Mine waste | 20,400 | 12.9 | 4.1 |
| Water <u>2/</u> | 400 | 0.3 | 0.1 |
| Other | 41,800 | 26.5 | 8.3 |
| All nonforest land | 157,900 | 100.0 | 31.5 |
| Gross | 501,900 | 100.0 | 100.0 |

1/ Based on aerial photographs taken in 1938 - 1939.

2/ Bureau of the Census, 1940.

Table 2.--Forest area by minor civil divisions

| Civil division 1/ | 1955 | Nonforest | Forest | Proportion | Proportion |
|---|--------|-----------|--------|------------|-------------|
| | area | area | area | gross area | of county |
| | Acres | Acres | Acres | in forest | forest land |
| | | | | Percent | Percent |
| Barry t. | 12,500 | 4,700 | 7,800 | 62.4 | 2.3 |
| Blythe t., Middleport, b., New Philadelphia b. | 19,700 | 1,800 | 17,900 | 90.7 | 5.2 |
| Branch t., Minersville b. | 7,700 | 1,300 | 6,400 | 83.4 | 1.9 |
| Butler, t., Ashland b., 2/ Girardville b., Gordon b. | 16,700 | 3,600 | 13,100 | 78.3 | 3.8 |
| Cass t. | 9,000 | 1,600 | 7,400 | 82.4 | 2.1 |
| Delano t. | 4,900 | 500 | 4,400 | 90.2 | 1.3 |
| E. Brunswick t., New Ringgold b. | 20,400 | 9,000 | 11,400 | 56.0 | 3.3 |
| E. Norwegian t., Mechanics- ville b., Paolo Alto b., St. Clair b., Port Carbon b. | 4,800 | 1,900 | 2,900 | 60.3 | 0.8 |
| E. Union t. | 16,400 | 3,300 | 13,100 | 80.0 | 3.8 |
| Eldred t. | 14,900 | 7,400 | 7,500 | 50.5 | 2.2 |
| Foster t. | 8,200 | 400 | 7,800 | 95.2 | 2.3 |
| Frailey t. | 5,900 | 100 | 5,800 | 98.7 | 1.7 |
| Hegins t. | 20,200 | 5,400 | 14,800 | 73.1 | 4.3 |
| Hubley t. | 8,600 | 4,300 | 4,300 | 50.2 | 1.2 |
| Kline t., McAdoo b. | 8,100 | 1,700 | 6,400 | 79.5 | 1.9 |
| Mahanoy t., Mahanoy City b. | 14,900 | 4,600 | 10,300 | 68.8 | 3.0 |
| New Castle t. | 7,800 | 400 | 7,400 | 94.3 | 2.1 |
| N. Manheim t., Mt. Carbon b., Cressona b., Schuylkill Haven b. | 15,300 | 6,900 | 8,400 | 54.9 | 2.4 |
| N. Union t. | 13,500 | 4,000 | 9,500 | 70.0 | 2.8 |
| Norwegian t., Pottsville c. | 6,200 | 2,400 | 3,800 | 61.6 | 1.1 |
| Pine Grove t., Pine Grove b. | 25,100 | 8,100 | 17,000 | 67.7 | 4.9 |
| Porter t., Tower City b. | 11,800 | 2,000 | 9,800 | 83.2 | 2.9 |
| Rahn t., Coaldale b. | 6,800 | 1,000 | 5,800 | 84.6 | 1.7 |
| Reilly t. | 10,400 | 500 | 9,900 | 95.5 | 2.9 |
| Rush t. | 15,500 | 4,600 | 10,900 | 70.4 | 3.2 |
| Ryan t. | 11,300 | 2,700 | 8,600 | 76.2 | 2.5 |
| Schuylkill t., Tamaqua b. | 7,400 | 1,000 | 6,400 | 86.8 | 1.9 |
| S. Manheim b., Auburn b., Landingville b. | 15,200 | 6,500 | 8,700 | 57.1 | 2.5 |
| Tremont t., Tremont b. | 15,600 | 500 | 15,100 | 96.7 | 4.4 |
| Union t., Ringtown b. | 14,500 | 5,900 | 8,600 | 59.2 | 2.5 |
| Upper Mahantango t. | 9,500 | 6,300 | 3,200 | 34.0 | 0.9 |

SCHUYLKILL

Table 2.--Forest area by minor civil divisions

| Civil Division 1/ | Gross area | Nonforest area | Forest area | Proportion gross area in forest | Proportion of county forest land |
|---|------------|----------------|-------------|---------------------------------|----------------------------------|
| | Acres | Acres | Acres | Percent | Percent |
| Walker t. | 14,300 | 3,300 | 11,000 | 77.0 | 3.2 |
| Washington t. | 20,200 | 10,500 | 9,700 | 48.0 | 2.8 |
| Wayne t. | 22,100 | 10,600 | 11,500 | 51.8 | 3.3 |
| W. Brunswick t., Deer Lake b., Port Clinton b., Orwigsburg b. | 22,000 | 10,800 | 11,200 | 51.0 | 3.3 |
| W. Mahanoy t., Shenandoah b., Frackville b., Gilberton b. | 7,400 | 3,300 | 4,100 | 55.3 | 1.2 |
| W. Penn t. | 37,100 | 15,000 | 22,100 | 59.6 | 6.4 |
| All civil divisions | 501,900 | 157,900 | 344,000 | 68.5 | 100.0 |

1/Abbreviations: t. - township, b. - borough, c. - city.

2/Includes only that part of Ashland b. that is in Schuylkill County.

Table 3.--Forest area by forest types and conditions

| Forest type | Saw-timber stands | | Pole-timber stands | | Unmerchantable stands | | All stands | |
|----------------------------------|-------------------|---------|--------------------|---------|-----------------------|---------|------------|---------|
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent |
| White pine - hemlock | 200 | 5.3 | 400 | 2.9 | 5,600 | 1.7 | 6,200 | 1.8 |
| White pine - red oak - black oak | 3,100 | 81.6 | 9,700 | 69.2 | 152,800 | 46.9 | 165,600 | 48.2 |
| White oak - red oak - black oak | 300 | 7.9 | 2,600 | 18.6 | 81,300 | 24.9 | 84,200 | 24.5 |
| Chestnut oak | 100 | 2.6 | 1,100 | 7.9 | 34,700 | 10.6 | 35,900 | 10.4 |
| Scrub oak | -- | -- | -- | -- | 50,000 | 15.3 | 50,000 | 14.5 |
| Other | 100 | 2.6 | 200 | 1.4 | 1,800 | 0.6 | 2,100 | 0.6 |
| All types | 3,800 | 100.0 | 14,000 | 100.0 | 326,200 | 100.0 | 344,000 | 100.0 |

Table 4.--Volume by forest types

| Forest type | Saw-log volume M bd.ft. | Total volume M cu. ft. |
|------------------------------------|-------------------------------|------------------------------|
| Sugar maple - beech - yellow birch | -- | -- |
| Aspen - gray birch - pin cherry | -- | -- |
| White pine - hemlock | 4,500 | 2,120 |
| White pine - white oak - red oak | 66,200 | 45,140 |
| Red oak - black oak - white oak | 22,400 | 16,510 |
| Chestnut oak | 5,800 | 4,960 |
| Scrub oak | 900 | 1,700 |
| Other | 1,000 | 900 |
| All forest types | 100,800 | 71,330 |

Table 5.--Forest area by forest conditions and volume-per-acre classes

| Forest condition and volume-per-acre classes | Area | Proportion of each condition | Proportion of total forest land |
|--|--------------|------------------------------------|---------------------------------------|
| | <u>Acres</u> | <u>Percent</u> | <u>Percent</u> |
| Merchantable: | | | |
| Saw-timber stands <u>1/</u> (bd. ft. per acre) | | | |
| 8,000 and over | 600 | 15.8 | 0.2 |
| 6,000 to 7,999 | 300 | 7.9 | 0.1 |
| 4,000 to 5,999 | 1,000 | 26.3 | 0.3 |
| 2,000 to 3,999 | 1,900 | 50.0 | 0.5 |
| All saw-timber stands | 3,800 | 100.0 | 1.1 |
| Pole-timber stands <u>2/</u> (cords per acre) | | | |
| 10.0 and over | 2,200 | 15.7 | 0.6 |
| 5.0 to 9.9 | 11,800 | 84.3 | 3.5 |
| All pole-timber stands | 14,000 | 100.0 | 4.1 |
| All merchantable stands | 17,800 | | 5.2 |
| Unmerchantable: | | | |
| Saw-timber stands less than 10 acres | 7,000 | | 2.3 |
| Pole-timber stands less than 10 acres | 17,400 | | 5.0 |
| Young growth stands | 251,800 | | 73.1 |
| Scrub oak stands | 50,000 | | 14.4 |
| All unmerchantable stands | 326,200 | | 94.8 |
| All forest land | 344,000 | | 100.0 |

1/ In stands 10 acres or larger each acre of which has at least 2,000 board feet (lumber tally).

2/ In stands 10 acres or larger each acre of which has at least 5 cords (400 cubic feet), but less than 2,000 board feet.

SCHUYLKILL

Table 6.--Volume by forest conditions and volume-per-acre classes

| Forest condition and volume-per-acre classes | Saw-timber volume (lumber tally) ^{1/} | | Total volume (including bark) | | | |
|--|---|---------|-------------------------------|---------|---------|-----------|
| | M bd.ft. | Percent | M cu.ft. | Percent | Cords | Tons |
| Merchantable: | | | | | | |
| Saw-timber stands (bd. ft. per acre) | | | | | | |
| 8,000 and over | 6,200 | 6.1 | 1,640 | 2.3 | 20,400 | 38,800 |
| 6,000 to 7,999 | 2,200 | 2.2 | 730 | 1.0 | 9,000 | 17,200 |
| 4,000 to 5,999 | 4,500 | 4.5 | 1,680 | 2.4 | 20,900 | 39,700 |
| 2,000 to 3,999 | 4,500 | 4.5 | 2,170 | 3.0 | 26,900 | 51,300 |
| All saw-timber stands | 17,400 | 17.3 | 6,220 | 8.7 | 77,200 | 147,000 |
| Pole-timber stands (cords per acre) | | | | | | |
| 10.0 and over | 4,800 | 4.8 | 2,000 | 2.8 | 25,400 | 52,700 |
| 5.0 to 9.9 | 11,400 | 11.2 | 6,170 | 8.7 | 78,800 | 163,100 |
| All pole-timber stands | 16,200 | 16.0 | 8,170 | 11.5 | 104,200 | 215,800 |
| All merchantable stands | 33,600 | 33.3 | 14,390 | 20.2 | 181,400 | 362,800 |
| All unmerchantable stands | 67,200 | 66.7 | 56,940 | 79.8 | 759,200 | 1,434,800 |
| All forest land | 100,800 | 100.0 | 71,330 | 100.0 | 940,600 | 1,797,600 |

^{1/} Based on the International 1/4-inch rule which closely approximates green lumber tally.

SCHUYLKILL

Table 7.--Volume in merchantable stands by species groups

| Merchantable class and species group | Saw-timber volume : (lumber tally) | | Total volume (including bark) | | | |
|---|---------------------------------------|---------|-------------------------------|---------|---------------------|--------------------|
| | M bd.ft. | Percent | M cu.ft. | Percent | Cords 1/ Percent | Tons 2/ Percent |
| Saw-timber stands | | | | | | |
| Conifers | 8,500 | 48.9 | 3,650 | 58.7 | 42,900 | 55.6 |
| Oaks and hickory | 6,600 | 37.9 | 1,130 | 18.2 | 15,100 | 19.5 |
| Other hardwoods | 2,300 | 13.2 | 1,440 | 23.1 | 19,200 | 24.9 |
| All species | 17,400 | 100.0 | 6,220 | 100.0 | 77,200 | 100.0 |
| Pole-timber stands | | | | | | |
| Conifers | 9,600 | 56.4 | 3,050 | 37.3 | 35,900 | 34.5 |
| Oaks and hickory | 3,900 | 33.0 | 4,160 | 50.9 | 55,500 | 53.2 |
| Other hardwoods | 1,200 | 10.6 | 960 | 11.8 | 12,800 | 12.3 |
| All species | 11,700 | 100.0 | 8,170 | 100.0 | 104,200 | 100.0 |
| All merchantable stands | 29,100 | | 14,390 | | 181,400 | 362,800 |

1/ Based on 85 cubic feet per cord for conifers and 75 cubic feet per cord for hardwoods.

2/ Based on cubic feet-per-ton converting factors for the principal species.

Table 8.--Board foot volume in merchantable saw-timber stands by diameter classes and species groups

| Diameter class (d.b.h.) (inches) | Conifers 1/ | | Oak and hickory 2/ | | Other hardwoods 3/ | | All species | |
|----------------------------------|-------------|---------|--------------------|---------|--------------------|---------|-------------|---------|
| | M bd.ft. | Percent | M bd.ft. | Percent | M bd.ft. | Percent | M. bd.ft. | Percent |
| 10 | 800 | 10.1 | | | | | 800 | 4.6 |
| 12 | 1,300 | 15.4 | 800 | 12.9 | 600 | 25.2 | 2,700 | 15.5 |
| 14 | 1,500 | 17.3 | 900 | 13.6 | 500 | 21.7 | 2,900 | 16.7 |
| 16 | 1,200 | 14.1 | 1,100 | 17.1 | 400 | 19.1 | 2,700 | 15.5 |
| 18 | 1,500 | 17.6 | 1,000 | 14.4 | 300 | 14.8 | 2,800 | 16.1 |
| 20 | 1,000 | 11.6 | 1,000 | 14.4 | 200 | 8.3 | 2,200 | 12.6 |
| 22 & up | 1,200 | 13.9 | 1,800 | 27.6 | 300 | 10.9 | 3,300 | 19.0 |
| All classes | 8,500 | 100.0 | 6,600 | 100.0 | 2,300 | 100.0 | 17,400 | 100.0 |

1/ Principally white pine, hemlock and pitch pine.

2/ Principally white, red, and black oaks, with some hickory and chestnut, scarlet and pin oaks

3/ Principally red maple, black birch, yellow poplar and white ash, with some walnut, aspen, black locust, sycamore, willow, basswood, elm and black gum.

SCHUYLKILL

Table 9. --Cubic foot volume in merchantable pole-timber stands by diameter classes and species group.

| Diameter class (d.b.h.) | Conifers 1/ | | Oaks and hickory 2/ | | Other hardwoods 3/ | | All species | | | | | |
|-------------------------|-------------|---------|---------------------|----------|--------------------|---------|-------------|---------|--------|-------|-------|---------|
| | M cu.ft. | Percent | Tons | M cu.ft. | Percent | Tons | M cu.ft. | Percent | Tons | | | |
| 6 | 350 | 11.5 | 7,100 | 1,030 | 24.8 | 31,900 | 320 | 33.4 | 8,400 | 1,700 | 20.8 | 47,400 |
| 8 | 500 | 16.4 | 10,200 | 860 | 20.7 | 26,700 | 200 | 20.8 | 5,200 | 1,560 | 19.1 | 42,100 |
| 10 | 700 | 23.0 | 14,200 | 690 | 16.6 | 21,400 | 180 | 18.7 | 4,700 | 1,570 | 19.2 | 40,300 |
| 12 | 820 | 26.9 | 16,700 | 650 | 15.6 | 20,100 | 150 | 15.6 | 3,900 | 1,620 | 19.8 | 40,700 |
| 14 & up | 680 | 22.2 | 13,700 | 930 | 22.3 | 28,700 | 110 | 11.5 | 2,900 | 1,720 | 21.1 | 45,300 |
| All classes | 3,050 | 100.0 | 61,900 | 4,160 | 100.0 | 128,800 | 960 | 100.0 | 25,100 | 8,170 | 100.0 | 215,800 |

1/ Principally white pine, hemlock, and pitch pine.

2/ Principally white, red, chestnut, and black oak, with some hickory, scarlet oak, and pin oak.

3/ Principally red maple, black birch, and white ash, with some yellow poplar, walnut, aspen, sycamore, willow, black locust, elm, yellow birch, red birch, basswood, black gum, and dogwood.

CARBON

Table 1.--Land use

| Land use | Area <u>Acres</u> | Proportion of class <u>Percent</u> | Proportion of gross area <u>Percent</u> |
|---------------------------|----------------------|--|---|
| Forest <u>1/</u> | | | |
| Tracts less than 10 acres | 2,300 | 1.1 | 0.9 |
| Tracts 10 up to 50 acres | 6,700 | 3.3 | 2.6 |
| Tracts 50 acres and over | 195,900 | 95.6 | 75.3 |
| All forest land | 204,900 | 100.0 | 78.8 |
| Nonforest | | | |
| Cropland <u>2/</u> | 28,700 | 52.1 | 11.1 |
| Mine waste <u>1/</u> | 4,400 | 8.0 | 1.7 |
| Water <u>2/</u> | 600 | 1.1 | 0.2 |
| Other | 21,400 | 38.8 | 8.2 |
| All nonforest land | 55,100 | 100.0 | 21.2 |
| Gross area | 260,000 | 100.0 | 100.0 |

1/ Based on aerial photographs taken in 1938 - 1939.

2/ Bureau of the Census, 1940.

CARBON

Table 2.-- Forest area by minor civil divisions

| Civil division | Gross area | Nonforest area | Forest area | Proportion gross area in forest | Proportion of county forest land |
|--|------------|----------------|-------------|---------------------------------|----------------------------------|
| | Acres | Acres | Acres | Percent | Percent |
| Banks t., Beaver Meadow b. | 8,100 | 1,200 | 6,900 | 85.2 | 3.4 |
| East Penn t. | 14,600 | 5,400 | 9,200 | 63.3 | 4.5 |
| Franklin t., Parryville b., Weissport b. | 10,800 | 5,500 | 5,300 | 49.2 | 2.6 |
| Kidder t., East Side b. | 47,800 | 1,600 | 46,200 | 96.6 | 22.5 |
| Lausanne t. | 3,900 | 800 | 3,100 | 80.5 | 1.5 |
| Lehigh t., Weatherly b. | 19,600 | 2,800 | 16,800 | 85.8 | 8.2 |
| Lower Towamensing t., Bowmanstown b., and Palmerton b. | 16,500 | 7,000 | 9,500 | 57.7 | 4.6 |
| Mahoning t., Leighton b. | 17,300 | 10,400 | 6,900 | 39.8 | 3.4 |
| Mauch Chunk t., Mauch Chunk b., Summit Hill b., East Mauch Chunk b., Lansford b. | 28,400 | 3,500 | 24,900 | 87.6 | 12.2 |
| Packer t. | 20,100 | 3,300 | 16,800 | 83.6 | 8.2 |
| Penn Forest t. | 49,300 | 1,900 | 47,400 | 96.1 | 23.1 |
| Towamansing t. | 23,600 | 11,700 | 11,900 | 50.3 | 5.8 |
| All civil divisions | 260,000 | 55,100 | 204,900 | 78.8 | 100.0 |

1/ Abbreviations: t - township; b - borough.

Table 3.-- Forest area by forest types and conditions

| Forest type | Saw-timber stands | | Pole timber stands | | Unmerchantable stands | | All stands | |
|----------------------------------|-------------------|---------|--------------------|---------|-----------------------|---------|------------|---------|
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent |
| Northern hardwoods | 700 | 7.3 | 6,400 | 19.8 | 17,300 | 10.6 | 24,400 | 11.9 |
| Aspen - gray birch - pin cherry | -- | -- | 300 | 0.9 | 5,100 | 3.1 | 5,400 | 2.6 |
| White pine - hemlock | 2,600 | 27.1 | 2,500 | 7.7 | 4,300 | 2.6 | 9,400 | 4.6 |
| White pine - white oak - red oak | 5,400 | 56.2 | 14,900 | 46.2 | 47,600 | 29.3 | 67,900 | 33.1 |
| White oak - red oak - black oak | 900 | 9.4 | 7,800 | 24.2 | 48,400 | 29.7 | 57,100 | 27.9 |
| Chestnut oak | -- | -- | 400 | 1.2 | 3,300 | 2.0 | 3,700 | 1.8 |
| Scrub oak | -- | -- | -- | -- | 37,000 | 22.7 | 37,000 | 18.1 |
| All types | 9,600 | 100.0 | 32,300 | 100.0 | 163,000 | 100.0 | 204,900 | 100.0 |

Table 4.--Volume by forest types

| Forest type | Sawlog volume | Total volume |
|------------------------------------|------------------|-----------------|
| | M bd.ft. | M cu.ft. |
| Sugar maple - beech - yellow birch | 16,100 | 11,730 |
| Aspen - gray birch - pin cherry | 300 | 1,580 |
| White pine - hemlock | 17,100 | 7,430 |
| White pine - white oak - red oak | 43,700 | 29,680 |
| Red oak - black oak - white oak | 19,200 | 16,070 |
| Chestnut oak | 500 | 670 |
| Scrub oak | 700 | 1,260 |
| Other | -- | -- |
| All forest types | 97,600 | 68,420 |

Table 5.--Forest area by forest conditions and volume-per-acre classes

| Forest condition and volume-per-acre classes | Area <u>Acres</u> | Proportion of each condition <u>Percent</u> | Proportion of total forest land <u>Percent</u> |
|---|----------------------|--|---|
| Merchantable: | | | |
| Saw-timber stands ^{1/} (bd. ft. per acre) | | | |
| 8,000 and over | 1,200 | 12.5 | 0.6 |
| 6,000 to 7,999 | 1,300 | 13.6 | 0.6 |
| 4,000 to 5,999 | 2,000 | 20.8 | 1.0 |
| 2,000 to 3,999 | 5,100 | 53.1 | 2.5 |
| All saw-timber stands | 9,600 | 100.0 | 4.7 |
| Pole-timber stands ^{2/} (cords per acre) | | | |
| 10.0 and over | 8,700 | 26.9 | 4.3 |
| 5.0 to 9.9 | 23,600 | 73.1 | 11.5 |
| All pole-timber stands | 32,300 | 100.0 | 15.8 |
| All merchantable stands | 41,900 | | 20.5 |
| Unmerchantable: | | | |
| Saw-timber stands less than 10 acres | 1,700 | | 0.8 |
| Pole-timber stands less than 10 acres | 19,000 | | 9.3 |
| Young growth stands | 100,200 | | 48.9 |
| Aspen stands | 5,100 | | 2.5 |
| Scrub oak stands | 37,000 | | 18.0 |
| All unmerchantable stands | 163,000 | | 79.5 |
| All forest land | 204,900 | | 100.0 |

^{1/} In stands 10 acres or larger each acre of which has at least 2,000 board feet (lumber tally).

^{2/} In stands 10 acres or larger each acre of which has at least 5 cords (400 cubic feet) but less than 2,000 board feet.

Table 6.--Volume by forest conditions and volume-per-acre classes

| Forest condition and volume-per-acre classes | Saw-timber volume (lumber tally) ^{1/} | | Total volume (including bark) | | | |
|--|---|---------|-------------------------------|---------|---------|-----------|
| | M bd.ft. | Percent | M cu.ft. | Percent | Cords | Tons |
| Merchantable: | | | | | | |
| Saw-timber stands (bd. ft. per acre) | | | | | | |
| 8,000 and over | 11,500 | 11.8 | 3,160 | 4.6 | 40,400 | 82,200 |
| 6,000 to 7,999 | 7,900 | 8.1 | 2,590 | 3.8 | 33,200 | 67,500 |
| 4,000 to 5,999 | 8,500 | 8.7 | 3,210 | 4.7 | 41,100 | 83,700 |
| 2,000 to 3,999 | 13,500 | 13.3 | 6,220 | 9.1 | 79,400 | 161,500 |
| All saw-timber stands | 41,400 | 42.4 | 15,180 | 22.2 | 194,100 | 394,900 |
| Pole-timber stands (cords per acre) | | | | | | |
| 10.0 and over | 11,100 | 11.4 | 7,770 | 11.3 | 100,800 | 216,700 |
| 5.9 to 9.9 | 14,200 | 14.5 | 12,710 | 18.6 | 165,300 | 355,100 |
| All pole-timber stands | | 25.9 | 20,480 | 29.9 | 266,100 | 571,800 |
| All merchantable stands | 66,700 | 68.3 | 35,660 | 52.1 | 460,200 | 966,700 |
| All unmerchantable stands | 30,900 | 31.7 | 32,760 | 47.9 | 436,800 | 887,700 |
| All forest land | | 100.0 | 68,420 | 100.0 | 897,000 | 1,854,400 |

^{1/} Based on the International 1/4-inch rule which closely approximates green lumber tally.

CARBON

Table 7. --Volume in merchantable stands by species groups

| Merchantable class and species group | Saw-timber volume : | | Total volume (including bark) | |
|---|---------------------|---------|-------------------------------|----------------|
| | M bd.ft. | Percent | Cords <u>1/</u> | Tons <u>2/</u> |
| Saw-timber stands | | | | |
| Conifers | 19,300 | 46.5 | 62,100 | 109,500 |
| Oaks, hickory, and hard maple | 13,700 | 33.1 | 65,600 | 151,900 |
| Other hardwoods | 8,400 | 20.4 | 66,400 | 133,500 |
| All species | 41,400 | 100.0 | 194,100 | 394,900 |
| Pole-timber stands | | | | |
| Conifers | 12,800 | 40.4 | 52,000 | 99,100 |
| Oaks, hickory, and hard maple | 15,200 | 47.6 | 142,500 | 329,900 |
| Other hardwoods | 3,800 | 12.0 | 71,600 | 142,800 |
| All species | 31,800 | 100.0 | 266,100 | 571,800 |
| All merchantable stands | 73,200 | 35,660 | 460,200 | 966,700 |

1/ Based on 85 cubic feet per cord for conifers and 75 cubic feet per cord for hardwoods.

2/ Based on cubic feet-per-ton converting factors for the principal species.

Table 8.--Board foot volume in merchantable saw-timber stands by diameter classes and species groups

| Diameter class (d.b.h.) inches | Conifer ^{1/} | | Oaks | | Other hardwoods ^{3/} | | All species | |
|--------------------------------|-----------------------|---------|-----------|---------|-------------------------------|---------|-------------|---------|
| | M. bd.ft. | Percent | M. bd.ft. | Percent | M. bd.ft. | Percent | M. bd.ft. | Percent |
| 10 | 2,300 | 11.7 | | | | | 2,300 | 5.5 |
| 12 | 3,800 | 19.5 | 2,800 | 20.3 | 3,200 | 37.4 | 9,800 | 23.7 |
| 14 | 3,300 | 17.1 | 3,100 | 22.6 | 1,800 | 21.4 | 8,200 | 19.8 |
| 16 | 2,300 | 12.1 | 1,900 | 13.7 | 1,500 | 18.3 | 5,700 | 13.8 |
| 18 | 2,500 | 12.8 | 1,500 | 10.9 | 900 | 10.7 | 4,900 | 11.8 |
| 20 | 1,800 | 9.4 | 1,500 | 11.3 | 300 | 3.8 | 3,600 | 8.7 |
| 22 & up | 3,300 | 17.4 | 2,900 | 21.2 | 700 | 8.4 | 6,900 | 16.7 |
| All classes | 19,300 | 100.0 | 13,700 | 100.0 | 8,400 | 100.0 | 41,400 | 100.0 |

^{1/} Principally hemlock and white pine with some pitch pine and red spruce.

^{2/} Principally red, white and chestnut oak, with some hard maple, hickory and black, scarlet and pin oak.

^{3/} Principally red maple, yellow birch and white ash, with some beech, black birch, black cherry, walnut, yellow poplar, sycamore, willow, black locust, basswood, and elm.

CARBON

Table 9.--Cubic foot volume in merchantable pole-timber stands by diameter classes and species groups

| Diameter class (d. b. h.) | Conifers 1/ | | Oaks and hickory 2/ and hard maple | | Other hardwoods 3/ | | All species | | |
|---------------------------|-------------|---------|------------------------------------|-----------|--------------------|---------|-------------|---------|---------|
| | cu. ft. | Percent | Tons | M cu. ft. | Percent | Tons | M cu. ft. | Percent | Tons |
| 6 | 250 | 5.7 | 5,600 | 490 | 4.6 | 15,200 | 450 | 8.3 | 11,900 |
| 8 | 1,540 | 34.9 | 34,600 | 3,930 | 36.7 | 121,000 | 2,440 | 45.5 | 65,000 |
| 10 | 1,220 | 27.6 | 27,400 | 3,280 | 30.7 | 101,300 | 1,440 | 26.9 | 38,400 |
| 12 | 800 | 18.0 | 17,800 | 2,180 | 20.4 | 67,300 | 370 | 6.8 | 9,700 |
| 14 & up | 610 | 13.8 | 13,700 | 810 | 7.6 | 25,100 | 670 | 12.5 | 17,800 |
| All classes | 4,420 | 100.0 | 99,100 | 10,690 | 100.0 | 329,900 | 5,370 | 100.0 | 142,800 |
| | | | | | | | | | 20,480 |
| | | | | | | | | | 571,800 |

1/ Principally hemlock, white pine, and pitch pine with some red spruce.

2/ Principally red, white, and chestnut oak with some black, scarlet, and pin oak, hard maple and hickory.

3/ Principally red maple, aspen, yellow birch and black birch with some white ash, black cherry, basswood, yellow poplar, walnut, sycamore, willow, black locust, elm, red birch, black gum, beech, dogwood, and gray birch.

Anthracite Survey Papers

| <u>No.</u> | <u>Title</u> |
|------------|--|
| 1 | Survey of Forest Employment Possibilities in the Anthracite Region of Pennsylvania * |
| 2 | Intensified Protection of Wyoming Valley Forests Against Fire Through Use of Community Labor** |
| 3 | Tax Delinquency of Forest Lands in the Anthracite Region of Pennsylvania** |
| 4 | Volume Tables for Commercial Timber in the Anthracite Region of Pennsylvania** |
| 5 | The Forests of Luzerne County, Pennsylvania, in relation to Employment and Welfare |
| 6 | The Population and Employment Outlook for the Anthracite Region of Pennsylvania |
| 7 | The Forest Situation in Pike and Monroe Counties |
| 8 | The Forest Situation in Dauphin and Lebanon Counties |
| 9 | The Forest Situation in Schuylkill and Carbon Counties |
| 10 | The Forest Situation in Wyoming and Sullivan Counties*** |
| 11 | The Forest Situation in Northumberland, Columbia, and Montour Counties*** |
| 12 | The Forest Situation in Luzerne and Lackawanna Counties*** |
| 13 | The Forest Situation in Wayne and Susquehanna Counties*** |

* Supply limited

** Out of print

*** To be published



COUNTIES OF THE ANTHRACITE FOREST REGION
OF PENNSYLVANIA