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The Southern Appalachians: A History of the Landscape

Susan L. Yarnell

The Author:

Susan L. Yarnell is a Researcher with the Forest History Society,
701 Vickers Avenue, Durham, NC 27701.

Cover: Yellow Poplar in the Big Sandy River Valley, Virginia, 1910.

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Contents

	Page
Introduction	1
Prehistory	2
Paleo-Indian Period	2
Archaic Period	2
Woodland and Mississippian Periods	4
Early History	6
European Settlement	8
Early 19th Century	9
Civil War and Its Aftermath	14
Late 19th Century	17
Early 20th Century	20
Early Conservation in the Southern Appalachians	24
Great Depression and New Deal	28
World War II and the 1950's	31
Recent Decades	35
Conclusion	39
Acknowledgment	39
Literature Cited	40
Appendix	
Plant Names	45
Animal Names	45

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Abstract

Natural and geological processes have changed the Southern Appalachian landscape repeatedly over millions of years. About 12,000 years ago, humans arrived and became important agents of change. People affected their environment by hunting, by spreading the seeds of plants they had gathered, by disturbing the vegetation around their habitations, and by increasing the frequency of fires. The extent and degree of human influence increased along with the population. In the Late Archaic period, horticulture expanded the impact of humans on the landscape. The first Europeans and Africans reached the Southern Appalachians in the 1500's. Their arrival disrupted American Indian societies with new forms of trade, warfare, and disease. By the late 1700's, only the Cherokee remained in the southern mountains. Thereafter, European settlers and African slaves established an economy based on farming, livestock, small-scale industry, and tourism. Market hunting greatly reduced wildlife populations, and grazing livestock affected vegetation. After reversals during the Civil War, mining, lumbering, and tourism emerged as the largest influences on the environment. Deforestation, erosion, pollution, fires, and floods became prevalent. Concern for conservation grew alongside industry, and, by the early 1900's, both public and private agencies were involved in managing the resources and landscape of the Southern Appalachians. Conservation and resource use have fluctuated throughout the 20th century in response to economic trends and historical events. Parks and wilderness areas have provided refuges for native plants and animals, whereas in national forests managers have sought to regulate resource extraction. Nevertheless, pressure remains intense on the Southern Appalachian landscape, and management issues bring contention as different groups seek to use the region's resources in different ways.

Keywords: Agriculture, environmental history, lumber industry, mining, prehistory, Southern Appalachian, tourism.

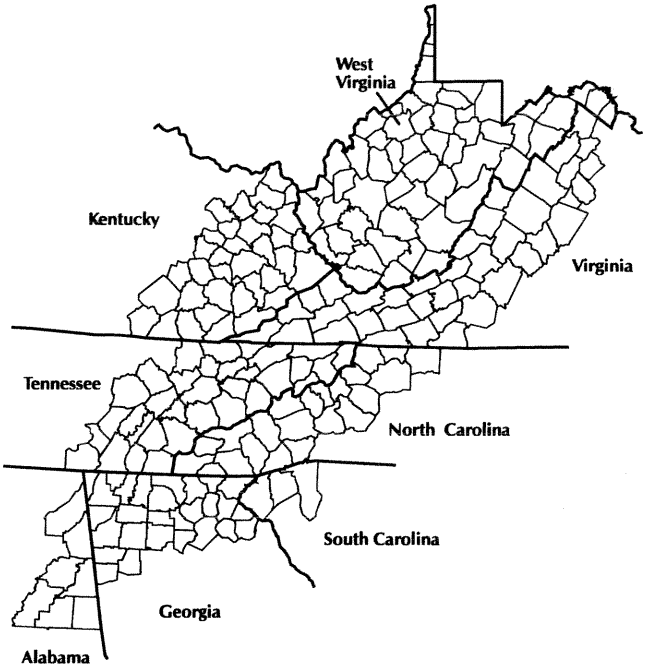

Figure 1—Southern Appalachian Region as defined in this publication.

Introduction

The Southern Appalachian region is defined primarily by mountains. Hence, its boundaries are vague and defined differently for different purposes. In this discussion, the Southern Appalachians include the State of West Virginia, southwestern Virginia, eastern Kentucky and Tennessee, western North Carolina and South Carolina, northern Georgia, and northeastern Alabama (fig. 1). This largely social definition follows the example of the Appalachian Regional Commission (1973) and studies such as *Mountaineers and Rangers* (Mastran and Lowerre 1983). Although all parts of the Southern Appalachians can alternatively be described as parts of other regions or States, their shared characteristics and identity as a region warrant studying the Southern Appalachians as a whole. In addition to a mountainous landscape, these areas share a common history alternating between cultural exchange and isolation from prehistory through the modern era. The region falls inside the boundaries of the American South and, thus, shares in the South's colonial, antebellum, and Civil War history. At the same time, the Southern Appalachians are distinguishable politically, economically, and socially from the South as a whole.

Understanding the dynamics of the Southern Appalachian landscape requires an understanding of how that landscape developed. The "natural" environment of a region is the result of a long history of change involving geology, climate, disturbance and stability, plants, and animals. The Southern Appalachian landscape is a very old one, the result of ancient geological processes and millions of years of weathering and climatic change. This long history resulted in a varied landscape and an exceptionally diverse assemblage of indigenous plants and animals. Although never glaciated, the Southern Appalachian climate shifted as the glaciers advanced and retreated. Variations in vegetation and animal species accompanied these climatic shifts as tundra, parkland, and boreal environments expanded and contracted. Remnant populations of

periglacial species found permanent niches within the varied topography and microclimates of the Southern Appalachians, whereas subtropical and temperate species colonized the lower elevations during warmer periods.

Local disturbances have also been important to the composition and structure of the Southern Appalachian environment. Fire, windstorms, ice storms, snow storms, and soil movement have produced a mosaic of vegetation across the landscape. The degree and aspect of slopes affect rainfall and soil moisture. Catastrophic events, such as large fires and storms, produce even-aged stands of trees within affected areas. Both large-scale and single-tree deaths provide openings for species adapted to disturbance, whereas sites subject to periodic burning favor fire-tolerant species, particularly conifers and oak (Fryer 1996: 94–99[1]). Regionally, the result is a patchwork of vegetation reflecting the particular histories of each locale. Human activity has also greatly affected the landscape. The role of humans in shaping the environment of the Southern Appalachians has drawn close scrutiny since the rise of the conservation movement during the 19th century. At the time, burgeoning mining and lumber industries were making rapid and conspicuous changes in the landscape. However, the impact of people on their environment has a much longer history. Hunting, plant gathering, home building, farming, trade, war, and industries are centuries old, and their impact on the Southern Appalachians is centuries old as well. The following discussion will consider how humans have affected the Southern Appalachian environment.

Prehistory

Paleo-Indian Period

Around 12,000 years ago, humans arrived in the Southern Appalachians. Fluted stone projectile points dating to the Paleo-Indian period (10,000 to 8,000 B.C.) have been found throughout the region. Manufactured from local stone, the points indicate Paleo-Indians were inhabitants of the Southern Appalachians rather than migrants or occasional visitors (Purrington 1983: 108). At the time of Paleo-Indian arrival, the Southern Appalachian climate was cooler and wetter than it is today. Boreal forests of spruce and pine with open parklands still dominated the landscape. By the end of this period, however, mixed oak- hickory forests became predominant with spruce remaining only at the highest elevations (Delcourt and others 1985).

As the environment changed, its human occupants changed. Paleo-Indians are generally characterized as small bands of nomadic hunters who relied on large game, particularly megafauna such as mammoths and mastodons. Megafaunal remains from the Big Bone Lick site in Kentucky may point to Paleo-Indian reliance on large game. However, evidence from other areas of Eastern North America suggests broader use of resources including white-tailed deer, elk, small game, birds, fish, and plant foods. As the climate changed, these resources increased in importance as the basis of Paleo-Indian subsistence (Tankersley 1990: 91). Paleo-Indian archaeological sites in the northern Shenandoah Valley of Virginia include settled base camps near sources of stone for tool production with hunting sites in upland areas. This pattern of sites suggests long-term occupation of specific territories rather than wide-ranging migration. Most other finds in the Southern Appalachians are from upland areas, and probably resulted from Paleo-Indians hunting for grazers on tundra habitats (Purrington 1983: 107–109).

Archaic Period

The Early Archaic period (7,500 to 5,500 B.C.) continued the pattern of base camps and upland hunting. Rock shelter sites from northern Alabama to eastern Kentucky have yielded the remains of butchered animals, including deer, elk, beaver, bird, and turtle (DeJarnett and others 1962, Jefferies 1990: 206). Likewise, tools made from local stone occur in many areas (Purrington 1983: 110–121). In contrast, sites in the Great Smoky Mountains and Pisgah National Forest contain tools made of stone from the Valley and Ridge province to the west. These findings may indicate that groups living in the Valley and Ridge area used the high mountains only as a hunting territory. Tools made of local materials do not appear here until near the end of the Early Archaic period. Rather than residential remains, Smoky Mountain sites yield evidence of hunting, flintworking, butchering, hideworking, and woodworking (Bass 1977: 51, 67; Purrington 1983). Of course, undiscovered residential sites may exist in the Appalachian Summit area. If so, use of nonlocal stone may indicate an exchange network between the regions (Chapman 1985: 148).

Hunting-related activities also occurred at residential sites. In addition, plant-processing tools, such as manos and metates, document the gathering of plants around residential sites; such tools are not in evidence at upland sites. New technologies may have made their appearance at this time. Well-preserved red clay hearths in the Little Tennessee Valley bear impressions of textiles and basketry, the earliest reliably dated example of weaving in Eastern North America (Chapman and Adovasio 1977: 624). Reflecting these varied activities, base camp locations show human reliance on diverse microenvironments and flood plain resources. The same pattern appears in eastern Kentucky, the Watauga Valley of North Carolina, and West Virginia as well as in the Valley and Ridge province (Broyles 1971, Chapman 1985, Jefferies 1990: 206–207).

[1] Numbers after the colon indicate where the information is located in the text.

Although most plant remains were acorns and hickory nuts, other remains recovered in the interior eastern woodlands of North America suggest broad utilization of forest and forest edge resources. The seeds, berries, and nuts of 20 plant species have been found in Early Archaic sites. Besides oak and hickory, these include: beech, hazelnut, walnut and butternut, chestnut, hackberry, persimmon, copperleaf, pigweed, goosefoot, bunchgrass, canary grass, pokeweed, knotweed, purslane, sumac, and grape.[2] Plant collecting added to human impact on the land through increased seed dispersal. People carried plant foods away from parent plants, sometimes into new habitats, while their camps provided small areas of disturbed soil that encouraged the growth of weedy species. The result was an increase in range for plants that provided food for humans (Smith 1992: 282).

Middle Archaic cultures (5,500 to 3,000 B.C.) built upon earlier practices in refining and expanding the exploitation of their environments. During this period, people apparently made broad use of their local landscapes; settlements were dispersed across both valley and upland zones. At the same time, the predominance of local stone in the production of tools implies a localized population (Bass 1977: 71–72, Purrington 1983: 122–125). New tools included the atlatl (spear-thrower) and net weights for fishing, suggesting changes in hunting strategy and an increased reliance on fishing (Chapman 1985: 148, Davis and Daniel 1990). A warmer and drier climatic period changed stream flow, expanding backwater and stream shallows. As a result, aquatic resources became more abundant and more accessible (Smith 1992).

Like the preceding periods, the Late Archaic period (3,000 to 1,000 B.C.) presents no sharp breaks with the past. Regional specialization grew from earlier generalized adaptations, and resource use expanded on established practice. People continued to rely on hunting, fishing, and plant gathering for their livelihood. Shell middens in some areas (northern Georgia and Alabama, the panhandle of West Virginia) show an increased use of freshwater shellfish, and many groups expanded their use of riverine resources (Bass 1977: 109; Davis and Daniel 1990: 256; Jefferies 1990: 153, 209; McMichael 1968: 10). The most striking development for both humans and their environment came toward the end of this era. Horticulture based on native crops emerged between 2,500 and 1,000 B.C. in the upper South, west of the Appalachians, and the lower Midwest, including eastern Kentucky and Tennessee. Gourds, squash, and sunflowers are still familiar to us. Seed crops no longer known in their cultivated forms were also important. The earliest of these were goosefoot, marsh-elder, and maygrass. Little barley (fig. 2) and knotweed were domesticated later during the first millennium A.D. (Smith 1992: 287–289, Yarnell 1994).

Until the advent of horticulture, only 10 percent of the wood preserved as charcoal in archaeological sites represents species favored by disturbed environments. From this period forward, until the arrival of Europeans and Africans in North America, the proportion of wood charcoal from pine, redcedar, tuliptree, and cane increased steadily to a maximum of 50 percent (Chapman and others 1982). The increase probably reflects conditions immediately surrounding human habitations in river valleys rather than those of the entire landscape. American Indians continued to use uplands until the historic era primarily for hunting and for gathering from nut-bearing trees.

American Indians cleared land by girdling trees to kill them. Smaller vegetation was then burned, both to clear the ground for crops and to provide fertilizing ash. New fields were cleared as yields declined in the old fields, allowing secondary forests to reclaim the land. When enough time had passed to restore the fertility of the soil, these areas were cleared anew. These activities also extended the forest edge,

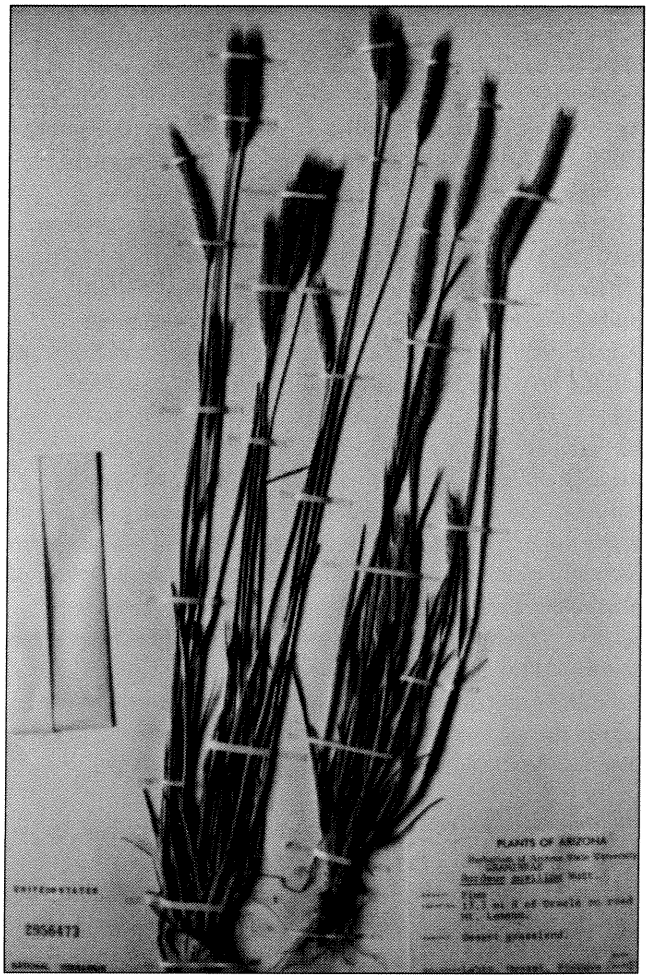

Figure 2—Little barley (*Hordeum pusillum* Nutt.), an important crop in eastern North America during the Woodland period. (Herbarium of Arizona State University photo.)

[2] The appendix provides complete scientific names of all species mentioned in this publication.

providing more habitat for important game animals including white-tailed deer and turkey. Certain plant foods, particularly berries, grapes, and persimmon, also became more abundant. Thus, agriculture augmented wild and cultivated food supplies, and the human population increased (Chapman and others 1982, Fritz 1990, Yarnell 1982).

Woodland and Mississippian Periods

During the Late Archaic period (3,000 to 1,000 B.C.), the people of the Southern Appalachians were clearly involved in cultural developments occurring beyond their own region. The spread of plant husbandry illustrates this spread of ideas. However, change occurred at different rates within the region. Evidence of gardening does not appear until the Middle Woodland period (300 B.C. to A.D. 600) in either the Appalachian Summit or the Allegheny Highlands of West Virginia. The people in these areas continued to live in base camps along alluvial terraces and in seasonal camps in the uplands (Davis 1978: 46–48, Purrington 1983: 133).

There are several possible explanations for this time lag. The rugged terrain may have slowed the diffusion of horticulture over the mountains; however, other types of exchange between eastern Tennessee and western North Carolina occurred in spite of the terrain. Soapstone bowls were exchanged for slate tools between the eastern slopes of the Appalachians and the Valley and Ridge province (Chapman 1985: 150–151). Another innovation, ceramics, spread throughout the Southern Appalachians during Early Woodland times (1,000 to 200 B.C.) including areas where horticulture was not evident (Chapman 1985: 152, Keel 1976: 211, McMichael 1968: 10, Purrington 1983: 131, Railey 1990: 250). Furthermore, the first evidence for Appalachian mining and trade in copper appears in Early and Middle Woodland sites. Archaeologists have recovered copper from the Southern Appalachians in Alabama, Georgia, and Florida (Goad 1978: 109). Because residents of the high mountains traded with horticulturalists, they probably had some knowledge of plant husbandry. Therefore, lower population densities and shorter growing seasons were probably as important as isolation in slowing the adoption of plant cultivation in the higher mountains. Moreover, the relative scarcity of good soils and the drier climate in the rain shadow of the mountains hindered gardening. Under these conditions, the difference in return for the effort of gardening versus that of foraging was probably lower in the highlands than on the western slopes of the Appalachians.

The emergence and spread of more intensive husbandry is associated with the first archaeological evidence of increasing social complexity. Burials began to differ among individuals in the amount and kind of goods interred with the body. Adena was one of the earliest complex cultures to affect the Southern Appalachians. Appearing in southern Ohio about 500 B.C., this culture spread into the mountains of Kentucky and western West Virginia. Adena sites include burial mounds, earthen enclosures, small habitations, and rock shelters (fig. 3). In addition to plant remains indicative of plant cultivation, Adena sites have yielded items made from materials obtained through long-distance exchange networks (McMichael 1968: 15; Railey 1990: 253, 315–316). Shared ceramic styles in northern Georgia, southwestern North Carolina, and eastern Tennessee point to another sphere of cultural interaction and exchange in the southernmost mountains (Keel 1976: 228–229).

Between A.D. 1 and A.D. 200, the Hopewell culture from southern Ohio began to influence the people of the Southern Appalachians. This culture was similar to Adena, but its burials and settlement patterns reveal an increase in both status differentiation and participation in exchange networks (Railey 1990: 254). Hopewell society was based on intensified premaize horticulture (Smith 1992: 201–248). Contact with the Hopewell culture through trade for copper, mica, soapstone, quartz crystals, and local schists influenced different parts of the Southern Appalachians to different degrees. A few sites with burial mounds reflect the influence of Hopewellian mortuary practices. Many other sites contain Hopewell ceramics and stone artifacts (Chapman and Keel 1979: 161, Davis 1978: 46–47, Railey 1990: 326).

A third important cultural influence for the Southern Appalachian peoples came from southern and central Georgia. Ceramics from Georgia have been found in significant amounts in western North Carolina and eastern Tennessee, whereas copper from the Southern Appalachians has been found as far south as Florida (Chapman 1973, 1985; Cridlebaugh 1981; Goad 1978: 186; Schroedl 1978). This southern influence continued to be important after Hopewell influence had faded during the Late Woodland period (A.D. 500 to 1000) and may have been involved in the rise of South Appalachian Mississippian culture (A.D. 1000 to 1540) (Ferguson 1971). Although not as dependent on planting as their trading partners to the north and south, South Appalachian societies apparently increased their reliance on plant husbandry between A.D. 200 and A.D. 1000. Settlements shifted to the floodplains with temporary camps to exploit upland resources. Social structure became more complex as well. Differing burials reflecting status differences between individuals began by A.D. 600 (Purrington 1983: 138–141).

Other important changes occurred during these centuries: the rapid diffusion of the bow and arrow throughout eastern North America and the increasing importance of crops introduced from Mexico. Central American crops—maize, beans, pumpkin, cushaw, amaranth, and tobacco—were introduced into eastern North America from the Middle Woodland through early Mississippian periods (Nassaney and Cobb 1991: 313–314, Railey 1990: 257, Smith 1992: 274–276). Present in east Tennessee as early as A.D. 175, maize was not an important crop until after A.D. 800 when

Figure 3—Rock Bridge Shelter, a woodland site in Wolfe County, Kentucky. (Photo by Kristen J. Gremillion.)

new varieties adapted to shorter growing seasons made it a viable crop at higher altitudes (Chapman and Crites 1987, Smith 1992: 274–276). Tobacco was grown east of present-day St. Louis after A.D. 500, and beans spread into eastern North America after A.D. 1000 (Smith 1992: 291–293). This era of agricultural change coincided with increasing reliance on agriculture and increasing population density. Wild foods continued to be important in all regions, but people living in the southern mountains made domesticated plants a larger part of their diet than they had in earlier periods (Yarnell 1976).

Between A.D. 1000 and 1500, growing populations created more complex societies. People lived primarily in river valleys, both in larger and more permanent villages and in scattered farmsteads. In the narrow valleys of the Appalachians, settlements clustered in areas with fertile soils in proximity to shoals for fishing. Houses were constructed of wood posts covered with cane wattle and clay daub or large pieces of bark. Civic structures included earth-banked buildings, public plazas, and platform mounds, some of which show use over several centuries. Social ranking was apparently more important in the southernmost mountains than in eastern Kentucky, southwestern Virginia, and West Virginia. Northern Georgia and Alabama, eastern Tennessee, and western North Carolina were part of the Lamar and Qualla culture areas. The development of chiefdoms in these areas after A.D. 1200 was marked by high-status burial goods including marine shell and sea turtle shell from the coast as well as ornaments made from mica and copper (Dickens 1976: 131; Hally 1994a: 144–174; Lewis 1990: 442; Purrington 1983: 142–149; Sharp 1990: 470, 512–527; Wynn 1990: 42–55).

By the time the first Europeans entered the Southern Appalachians in 1540, chiefdoms were important political units in the Southeast. They varied in size from a few towns and kin groups to paramount chiefdoms incorporating numerous social and kin groups (Widmer 1994: 126). Coosa, with authority stretching from the confluence of the French Broad and Tennessee Rivers to the vicinity of Talladega in Alabama, was one of the largest of the Lamar chiefdoms (Hudson 1994: 86). Its towns ranged in size from 1 to 6 hectares (2.5 to 15 acres) (Hally 1994b: 231–233). A Spanish description of Coosa in 1540 refers to "numerous and large towns with fields between, extending from one to another" (Elvas 1993: 76). These settlements were interspersed with thinly settled or uninhabited regions where human influence on the landscape was much lighter (Hally 1994b: 249). Even in densely populated Coosa, the

ridges were "well-wooded," and outside the cultivated valleys, the land was "all forest" (Priestly 1928: 241).

In western North Carolina, the Qualla culture was ancestral to the Cherokee. Although it was less complex than Coosa, early descriptions of the Qualla landscape were similar to that of Coosa, including palisaded towns and large expanses of cultivated fields. The Fort Ancient cultures of eastern Kentucky and West Virginia also built villages, often in a circular pattern around central plazas. Like their neighbors to the south, Fort Ancient villages were sometimes protected by wooden palisades. Smaller communities in eastern West Virginia and southwestern Virginia show fewer signs of social hierarchies. However, all areas shared an economy based on farming, hunting, and gathering wild plant foods (Dickens 1976).

Although separated by hundreds of miles, these cultures were not isolated. All participated to some degree in trade, warfare, and diplomacy. Heavily traveled routes, such as the "Great Warrior Path," connected communities from the Kanawha River in West Virginia to the towns of northern Alabama. Side branches took in the Shenandoah Valley, northern Georgia, and western North Carolina. These trails joined a network of paths connecting the southern mountains with communities and cultures from the Northeast and Great Lakes to the gulf and Atlantic coasts. Other trails stretched west to the Mississippi River and beyond (Tanner 1989: 6–20).

The Southern Appalachians were cultural landscapes deeply influenced by human activity. Towns, farmsteads, and fields were interspersed with old-growth forest used primarily for hunting and gathering nuts. Secondary forests grew on old fields in various stages of regrowth, providing fuel, building supplies, and an augmented supply of wild plant foods and game. Human use of fire reduced underbrush in some places and contributed to prairie openings, which drew deer and bison. Some researchers have suggested that Woodland and Mississippian people even created orchards of fruit and nut-bearing trees by clearing less productive trees to give the more productive ones more room to grow (Gremillion 1993: 17-18, Smith 1992: 287). The product of 10,000 years of human activity, this landscape was not an unpeopled wilderness. The customs established over thousands of years would continue to shape the environment over the next several centuries. However, the arrival of Hernando de Soto in 1540 introduced new agents of change, creating a new environment for American Indians, Europeans, and Africans in the Southern Appalachians.

Early History

Change came to the Southern Appalachians immediately on the heels of De Soto's visit. When Tristan de Luna revisited the area between 1559 and 1561, he found the population of Coosa in decline. The political power of Coosa was weakened, and its influence had waned. Because of their reduced strength, the people of Coosa enlisted the help of De Luna's soldiers in an attack on their former tributaries near Chattanooga, TN. De Luna's intervention may have slowed the decline, but the changes at Coosa were the first stages in the collapse of the paramount chiefdoms. Social disruption caused by Spanish intrusions was one source of change (Hudson and others 1989: 40–42). Another was the introduction of new diseases from Africa and Europe. Malaria, smallpox, cholera, and other diseases had a brutal effect on American Indian populations. Without inherited immunities, the Indians were "virgin ground" for infection, and the death rate was extremely high (Crosby 1976).

By 1600, American Indians were abandoning old towns and migrating to new territories in response to the social disruption and disease. Most Lamar people in the mountains spoke Muskogean languages and were probably ancestors of the Creek and Choctaw. By the late 17th century, the Cherokee people had spread into northern Georgia and Alabama and replaced the Lamar culture in that area. Cherokee towns of the Appalachian Summit in North Carolina and Tennessee persisted, but significant changes occurred (Smith 1989: 21–31). Qualla communities shifted toward the southwest, possibly in response to the decline of Lamar chiefdoms. Around the same time, population density declined in the French Broad River Valley and other northeastern portions of the Cherokee territory. In addition, the archaeological record suggests that social and political systems decentralized; palisaded towns overseeing a hierarchy of smaller settlements gave way to loosely grouped households, sometimes scattered along the rivers (Purrington 1983: 149–150).

European trade goods began to filter into the interior southeast by the late 16th century. The Juan Pardo expeditions between 1566 and 1568 established short-lived posts in western North Carolina and eastern Tennessee. In an attempt to block French colonial expansion, Pardo gave trade goods to high-ranking individuals in each town visited. In return, he required them to build and stock storehouses for Spanish use. Although these outposts were overrun within a year or two, their construction brought significant numbers of iron tools into the mountains for the first time. Interest in these items ran high, and leaders traveled as far as 200 miles to see Pardo and receive goods (Depratter and Smith 1980).

Trade in deerskins and bison hides began in the 1560's and, by the 1630's, had drawn a few residents of the eastern Tennessee Valley to Spanish missions on the coast. Rather than relocate, most groups sent trading parties or dealt with middlemen. Others moved from previous homes to avoid slave raids and warfare brought on by the new trade (Smith 1989: 30). European goods found in archaeological sites from northern Alabama to southwestern Virginia predate

1700. Early trade goods included items that fit into prehistoric trade patterns: brass and copper, iron tools, textiles, and glass beads. Other items, particularly guns, were new and added to both the social and environmental change in the region (Waselkov 1989).

During the late 1600's, hostilities between American Indians and the Spanish allowed the newly arrived English to enter the trade. In 1670, English colonists from Virginia learned of a route through the mountains to rivers that flowed west. Hoping to find a passage to the Pacific Ocean, a party led by Thomas Batts and Robert Fallam left Appomattox in September 1671. With Saponi Indian guides from the Virginia piedmont, they traveled up the Roanoke River and crossed the Blue Ridge at Adney Gap. From there they crossed to the New River, then passed through the southern part of present-day West Virginia along the Guyandotte River. They ended their trip near the site of Matewan, convinced they had seen tidal flow in the rivers (Briceland 1991, Crane 1929: 14–15).

Because crossing the Appalachians through present-day West Virginia was difficult, Virginians explored a more southerly route in 1674. With Tomahitan guides, one party journeyed from modern-day Morganton, NC, to the site of Asheville and then southwest to the Coosa River near modern-day Rome, GA. A second group accompanied a Tomahitan war party down the Warrior's Path into Kentucky and Tennessee. Traders soon used these paths to penetrate the Southern Appalachians (Briceland 1991: 35). During these same years, traders from newly founded Charleston in South Carolina began competing for the trade of the mountain peoples. Carolinian traders reached Cherokee territory in 1690, though most of the trade between Charleston and the Cherokee was conducted through American Indian middlemen until the early 1700's (Crane 1929: 40; Hatley 1993: 18, 32–37). Soon, French expeditions along the Ohio and Mississippi Rivers provided the Charleston traders with new information about the Southern Appalachians. Jean Couture, a *coureur du bois*, left the service of La Salle and Tonti in the 1690's and crossed the mountains from the west by way of the Tennessee River. In 1700, he led Englishmen back across the mountains to the Mississippi, where they laid claim to the river like the Spanish and French before them (Crane 1929: 42–44).

Although enormous social and cultural changes had taken place at the southern edge of the Appalachians, the influence of trade had even greater implications for the people of Appalachian Virginia and eastern Kentucky. Most of the people in present-day West Virginia and eastern Kentucky at this time were probably Shawnee and Susquehannock. European trade goods entered the area after 1650 through the Iroquois who traded with Europeans in the Northeast. Disease introduced by trading parties and warfare with the powerful and well-armed Iroquois weakened the mountain societies. The Iroquois then either absorbed the declining communities or pushed them out of their territories to expand the Iroquois hunting range (McMichael 1968: 53–55). The Batts and Fallam expedition of 1671 saw signs of these displaced people. By Tug Fork above the Big Sandy, abandoned fields were growing up in "weeds and small prickly locusts and thistles to a very great height." The cultivators of these fields were still remembered by their former neighbors, the Saponi and Tutelo (Briceland 1991: 34). Some of these people moved south into areas depopulated by disease and warfare under Spanish influence (Smith 1989). One Shawnee group, the Savannah, became middlemen in the deerskin trade in Georgia (Crane 1929: 19).

In addition to social disruption and change, American Indians also confronted environmental change. New plants and animals entered the landscape, often traveling ahead of the Europeans and Africans who brought them to North America. Women, as the farmers of their societies, governed the integration of crops and livestock into traditional systems. The peach tree, an Asian native, was the first of the new plants to be adopted. Peaches spread like weeds from the Spanish missions along the gulf and Atlantic coasts in the 16th century and settled easily into the "orchards" of southeastern American Indians. Cowpeas (black-eyed peas) from Africa were grown in central Alabama as early as 1670 and soon spread to the Cherokee. Like peaches, cowpeas fit easily into indigenous farming systems and did not require new agricultural techniques (Gremillion 1993). By the 1700's, the Cherokee had added watermelons and sweet potatoes to their diets. In contrast to the new crops, new animals were more difficult to assimilate. Even so, hogs and fowl were significant parts of the Cherokee diet by the 1750's. Acceptance of cattle came more slowly because they damaged crops and were perceived as the "deer of the white men." These plant and animal additions increased the productivity of Cherokee agriculture and helped the Cherokee survive the wars and upheaval of the 1700's (Hatley 1991: 43–46, 1993: 161; Timberlake 1948: 72).

Trade with settlers in Carolina and Virginia brought more fundamental change to American Indian life than did agricultural innovation. The primary trade item was deerskin, leading to extreme pressure on white-tailed deer populations throughout the Southeast. As the only remaining indigenous society of any strength still residing in the Southern Appalachians, the Cherokee possessed a good hunting base. Yet, in the quest for deerskins, the Cherokee expanded their hunting territories into the southern Piedmont from southeastern Virginia to northern Alabama and into depopulated regions of eastern Tennessee and Kentucky. This expansion elevated tensions between the Cherokee and their neighbors. Trade in American Indian slaves was another source of tension; wars were begun both as an excuse for taking slaves and in retaliation for past slave raiding. As a result, intermittent fighting occurred throughout the 1700's, often encouraged

by the English (Crane 1929: 17–18, 263; Hatley 1993: 29, 67; Satz 1979: 14).

In areas depopulated by war and disease, secondary forests began to overtake open fields and prairies. However, places maintained as hunting territory were kept open with fire (Hatley 1993: 212). As the 18th century progressed, the productive Cherokee lands drew increasing pressure from white settlers. Game, much reduced in the lowlands, was still abundant in the mountains. Those who came to hunt and trade often stayed to raise livestock and build personal estates. Soldiers involved in actions against the Cherokee in the mid-1700's and the American Revolution brought back tempting descriptions of Cherokee lands. These reports renewed interest in the forests, fields, and minerals of the mountains (Hatley 1991: 45–46; 1993: 42–43, 195; Timberlake 1948: 47, 68–73).

Beginning in the late 1760's, Cherokee territory was steadily reduced through a series of cessions and takings (Finger 1984: 6–7; Hatley 1993: 205–222, 232). Mirroring the loss of territory, the Cherokee population also dwindled under increasing assaults and epidemics. In 1685, approximately 32,000 Cherokees lived in the Southern Appalachians. By 1790, fewer than 8,000 remained (Wood 1989: 38). Some had moved to Arkansas; many others had died. The remaining Cherokees attempted to insulate themselves from further conflict. They moved their farmsteads to secluded valleys and lived in a manner similar to European settlers. A smaller portion, often mixed-blood Cherokees, emulated white planters and established large farms run with slave labor. All were under increasing pressure to cede their remaining land to white settlers, culminating with the Cherokee removal in the 1830's (Hatley 1993: 233).

European Settlement

Long before the removal of most Cherokee from their homeland, settlers of European descent were arriving in the Southern Appalachians. In Virginia, settlement was concentrated in the Valley and Ridge province before 1750, especially in the Shenandoah Valley (Rice 1970: 13). Scarcity of good farmland in Pennsylvania led farmers south into the northern Shenandoah Valley during the 1730's. Planters from the Virginia tidewater and Piedmont arrived during the late 1760's and early 1770's. Most early arrivals settled on limestone soils and practiced mixed farming based on grains and livestock. New settlers and soldiers stationed on the frontier provided early markets, but after 1760 wheat exports to Atlantic ports became important. Tidewater planters added tobacco, hemp, and slave labor to wheat production, creating a hybrid system that ultimately spread across the upper South (Hofstra 1991).

To the west of the Shenandoah Valley and in many parts of the Southern Appalachians, the raising of open-range livestock dominated the economy. Both the mast-producing hardwoods and the lowland canebrakes provided abundant forage for livestock. Furthermore, livestock were a valuable commodity that could be sold on the frontier or driven to eastern markets. As early as the 1740's, drovers were moving cattle north from the Carolinas to Philadelphia through the Shenandoah Valley (MacMaster 1991: 130, 132). The south branch of the Potomac supplied frontier garrisons with beef in the 1750's. Horse-stealing and trading by hunter-traders were common in the South Carolina backcountry during the mid-1700's. These men probably raised livestock as well. As in Virginia, some made their fortunes supplying military posts with livestock and rose to positions of prominence. Revolutionary War leader Andrew Williamson started his career as a cow driver supplying Fort Prince George near Keowee in the 1750's (Hatley 1993: 171, 181–183). Besides keeping livestock, early settlers relied heavily on hunting for both food and cash, competing with American Indians in the fur and deerskin trade. A Moravian visitor to southwest Virginia described them as people "who live like savages. Hunting is their chief occupation" (quoted in Hatley 1993: 83).

Other early arrivals on the southern frontier were factions of German Protestant sects from Pennsylvania. They followed routes down the Shenandoah to the New River and Watauga Valleys. At the close of the Seven Years' War, immigration into the western Carolinas and northern Georgia increased dramatically. Southwestern Virginia recovered from wartime losses, and its population began growing steadily (Beeman 1985: 219; Cashin 1984: 231, 236; Greene 1984: 296; Mitchell 1977: 96). Like those who had lived in the mountains before them, the earliest settlers took up land in the fertile bottom lands. Attracted to these already domesticated environments of canebrakes, fruit and nut trees, plentiful game, and stone fishtraps in the rivers, they nonetheless described the land as "virgin" (Hatley 1993: 86, Rice 1970: 66).

The first Europeans to spend significant periods in eastern Kentucky were probably French traders. English traders joined the French in the Ohio Valley by 1749. That same year, agents of Virginia's land speculators arrived through the Cumberland Gap (McBride and McBride 1990: 584–585, Rice 1975: 10–11). These activities were suspended by war but resumed immediately after the war ended. Professional hunters ("long hunters") were important precursors to European settlement in eastern Kentucky and Tennessee as they had been in the East. The long hunters traveled on the ancient trail network across the Cumberland Gap or down the Great Warrior Path. In the process, they helped scout the land for future settlers, often their own families. They were impressed by the abundance of game and the open prairies, remnants of American Indian land use practices (McBride and McBride 1990: 587, Rice 1975: 20–22).

Appalachian Virginia settlements were largely destroyed during the wars of the 1750's and 60's, but American Indian land cessions after the wars led to a rush of settlers into most of the major river valleys (Davis 1978: 56–66). Some new settlers were former soldiers taking advantage of land warrants awarded to them for their military service. Others were land speculators. One prominent speculator, George Washington, accumulated the rights of numerous veterans and used them to acquire prime land on the Ohio and Kanawha Rivers (fig. 4). On a surveying trip in 1770, Washington was impressed by the timber in the region. He described a mixed-hardwood forest of beech, walnut, and oak, with sycamore trees up to 45 feet in circumference, near the junction of the Kanawha and Ohio Rivers. In addition to the Kanawha's good timber, Washington appreciated American Indian old fields and praised them as "excellent meadows." Washington sent workers to his Appalachian lands where they erected buildings and planted 28 acres of land with crops and peach trees. These improvements were cut short by the American Revolution (Clendening 1931: 101, Rice 1970: 76–79, Williams 1989: 41).

Washington was one of many Virginia speculators whose efforts were interrupted by the Revolution. Increasing hostilities during the 1770's again interfered with European expansion as American Indians allied themselves with the British in a last effort to keep their homelands. In the long run, however, the Revolution removed the restrictions of British policy and American Indian resistance against expansion into the Southern Appalachians. Thereafter, the movement of people into and through the southern mountains accelerated. Despite the war, two counties, Wilkes and Burke, were created in North Carolina during 1777. In North Carolina, as in Appalachian Virginia, the earliest settlers took up large tracts of bottom land with access to trade routes. French botanist Francois Michaux particularly noted "the pasturage of these wild peas for the cattle" among the attractions of the area (Inscoe 1989: 12–13, 26).

In Kentucky, the first Euro-American communities grew up in the bluegrass region rather than in the mountains. Immigration to the mountains began with the end of the American Revolution (McBride and McBride 1990a: 592). The first counties in the mountains of Kentucky, Knox and Floyd, were established around 1800. In eastern Tennessee, establishment of Euro-American control took longer. The continued strength of the Cherokee, particularly the determined resistance of the Chickamauga branch led by Dragging Canoe, continued to slow the advance of Euro-Americans into the upper Tennessee River drainage until the 1790's (Govan and Livingood 1977: 37–50).

Early 19th Century

After the Chickamauga's defeat, roads were quickly constructed from Augusta, GA, into eastern Tennessee (Govan and Livingood 1977: 53–54). By the early 19th century, the United States had asserted its control over the entire Southern Appalachian region. While still thinly populated, the area was connected to national markets with toll roads following the old trails. The new inhabitants took over the trade in deerskins, furs, chestnuts, and ginseng from displaced American Indians. Agricultural practices in many areas also resembled American Indian customs. Farmers cleared land by girdling trees and burning smaller vegetation, which yielded ash fertilizer (fig. 5). They cleared new fields as yields declined, allowing secondary forests to reclaim old fields for 20 years or more. After a long fallow period, the old fields were recleared. As with American Indian agriculture, these enlarged forest edge habitats increased populations of game animals and wild fruit. Forest fallowing survived where population densities were low until the early 20th century (Otto 1987). In large valleys, where population was concentrated and commercial agriculture demanded more from the land, farmers adopted intensive land use methods much earlier. In Virginia, a few were using clover, plaster, and lime to maintain fertility before the Civil War (Gray 1958: 881).

Colonial patterns of livestock-keeping continued in the 19th century. In a practice common all over the colonial Southeast, mountaineers turned their animals onto an open range of forests and old fields while fencing protected their crops from damage (Otto 1987). Several methods kept livestock from straying too far. Salt licks and periodic feedings encouraged animals to remain in the vicinity of the farmstead. Some mountain farmers built their farmsteads at the mouths of coves or small valleys, using the topography as fencing (Rice 1970: 15). In the highlands, transhumance was a common feature of livestock-keeping. Animals stayed in pastures close to home during the winter and were driven to pastures higher in the mountains in the summer. Bald mountains were favored summer pastures and were sometimes created through clearing and burning. In the Great Smokies, Cades Cove residents used mountain balds as pastures from the 1830's until their eviction from the national park in 1937. White Top Mountain near Mount Rogers, VA, was grazed from 1828 until the 1950's (Blethen and Wood 1991: 162; Dunn 1988: 32–34; Pyle and Schafale 1988: 4, 9, 16).

To reach markets, Kentuckians drove their livestock through the Cumberland Gap to east Tennessee. From there, the animals of both regions went on to Georgia and the Carolinas. One of the most important routes for livestock over the mountains was the French Broad River Valley. As many as 150,000 hogs came over from Tennessee in one season. Another important route ran through the Big Sandy and Ohio Rivers to northeastern markets, whereas the Knoxville area supplied northern Alabama and western Georgia. Districts such as the valley of Virginia and east Tennessee specialized in fattening livestock from more remote areas for market. Hogs, cattle, and mules were the

Figure 4—Virgin white pine-hardwood stand in George Washington National Forest, Rockingham County, Virginia.

Figure 5—Trees killed by girdling to clear for a farm in the Blue Ridge Mountains.

most common livestock driven, but even fowl were moved to market in this manner (Lewis 1988: 840–841, 881–885; Sondley 1930: 617–621).

Besides contributing animals, farmers in these regions supplied corn and fodder to the migrating herds. Stock stands provided shelter for both people and animals and provided a place where drovers could obtain information on road and market conditions. Professional drovers worked side by side with farmers who made the trip on their own account. By the 1830's, these mountain valleys became summer destinations for wealthy visitors escaping the heat. Some roadside stands became hotels to accommodate these early tourists. Warm Springs on the French Broad River hosted summer guests who hunted and visited the mineral springs. In the winter, the hotel continued to depend on the livestock drives for business (Blethen and Wood 1991: 161–164). Mineral springs in Kentucky and Appalachian Virginia developed as resort areas during the same period (McBride and McBride 1990: 605, Rice 1972: 329–331). Mount Mitchell was another tourist destination. In the years before the Civil War, hiking trails, mountain cabins, and curiosity about the highest peak in the East drew visitors from as far away as Charleston, SC (Schwarzkopf 1985: 35–48).

Although livestock was important to the economy, grains, dairy products, potatoes, wool, orchard products, and honey were also significant commercial products of Southern Appalachian agriculture. In addition, flax and tobacco were produced for local consumption (Hall 1991: 166–169, Inscoe 1989: 13–24). Most small-scale industries of the era were associated with the agricultural production of the region. In Appalachian Virginia, the introduction of Merino sheep in 1806 led to the establishment of carding mills. Wellsburg, WV, also had a woolen factory, a rug factory, and, by 1830, a cotton factory employing 60 people (Rice 1970: 322). Gristmills and distilleries transformed grain into flour or whiskey and fruit into brandy. The goods produced

were more valuable, less bulky and perishable, and easier to transport to markets (Davidson 1946: 211, Gray 1958: 884–885, Kegley 1979: 31, Rice 1970: 323). In some places distilling became a major occupation; in 1810, 106 distilleries made over 20,000 gallons of spirits in Burke County, North Carolina (Inscoe 1989: 48–49). In contrast, until the mid-19th century more remote settlements such as Cades Cove relied on small tub mills owned and run by individual farmers (Dunn 1988: 80–81).

Like textiles and tobacco, early lumbering in the mountains was primarily for local consumption; only 40 water-powered sawmills operated in what is now West Virginia by 1835. Beginning in the 1830's, landowners along rivers floated lumber to markets on the Ohio and Mississippi Rivers. Logs were transported as rafts or flatboats that carried settlers and cargoes of barrel staves, salt, flour, whiskey, and cotton (fig. 6). From northern Alabama to the Cheat and Tygart Rivers, huge poplars became boats 20 feet wide and 75 to 120 feet long. One source estimated over 100 of these boats were used on the Little and Big Coal Rivers from 1836 until after the Civil War. On the Kanawha River, saltworks used more than 300 flatboats in 1829, and their needs continued to rise until 1846. In addition, rafts of poplar and walnut were occasionally sold (Clendening 1931: 102; Davidson 1946: vol 1, 212–15; Davis 1978: 77–78; Gray 1958: 869; Rice 1970: 318). Rafts and flatboats from the Southern Appalachians were a part of the timber trade down the Allegheny and Ohio Rivers, which started in 1805, peaked between 1832 and 1840, and virtually ended by 1870 (Williams 1989: 186).

Like lumbering and tourism, industry and mining in the Southern Appalachians also began in the early 19th century. The production of salt and saltpeter was important for both local markets and export. Appalachian Virginia and eastern Kentucky were the major sources of these commodities (Gray 1958: 869–871, 885; Kegley 1979: 102; Rice 1970: 310–313). Salt was crucial for food preservation, especially meats. Meat processing in Kentucky and Knoxville, TN, relied on salt from these sources (Moore 1991: 229–230). Saltpeter, or potassium nitrate, is a major ingredient in

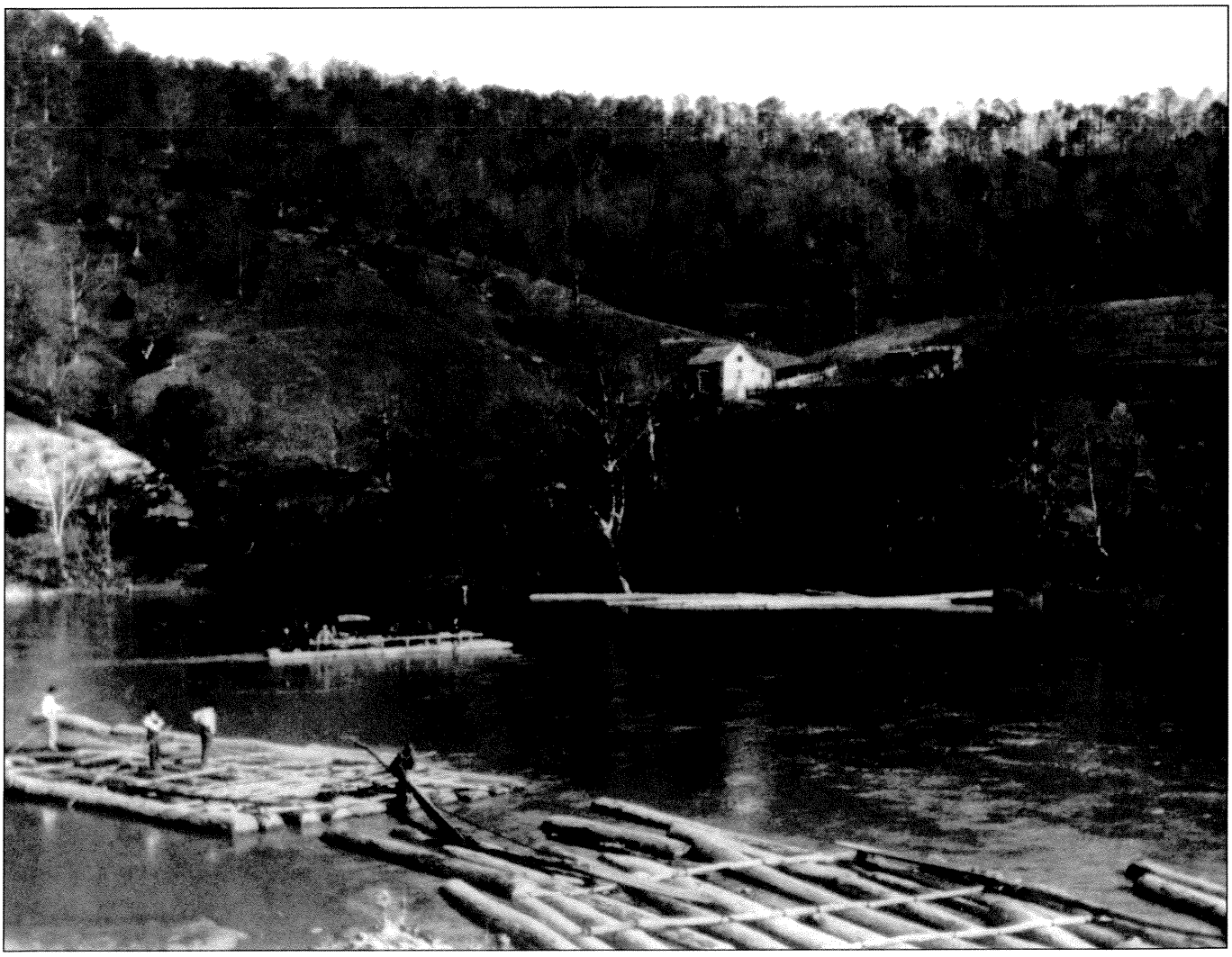

Figure 6—Log rafts in eastern Kentucky.

gunpowder and some fertilizers. At the close of the Revolution, Thomas Jefferson recorded over 50 saltpeter caves operating along the Greenbrier River alone (Jefferson 1787: 34). In Kentucky, the two largest sources of saltpeter were Mammoth Cave and the Appalachian Mountains. The saltpeter industry was particularly vigorous during the Revolution, the War of 1812, and the Civil War, when the demand for gunpowder was high (Davis 1978: 75; McBride and McBride 1990: 596, 610).

Small charcoal-fired iron furnaces were another locally important industry. One of the earliest furnaces operated in the 1740's near Harper's Ferry, and others followed, making Wheeling an important iron center (Rice 1972: 123). Iron making began in Kentucky in 1791 on what is now the Daniel Boone National Forest. Before midcentury, ironworks were scattered throughout the Southern Appalachians, especially eastern Kentucky, southwestern Virginia, northern Alabama, and northern Georgia. The demands made by charcoal-fired furnaces on the forests often led to abandonment of ironworks due to insufficient fuel. Furnaces were sometimes reopened after forests in the vicinity recovered. Clearcutting in these locales increased the extent of even-aged secondary forests. A postwar furnace in Anniston, AL, that produced 6,100 tons annually needed 20,000 acres of timberland for a permanent fuel supply (Collins 1975: 146–150; Inscoe 1989: 70; Kegley 1979: 124–127; Moore 1991: 230–231; Williams 1989: 149–151, 340–342).

Competition with wood, an abundant and cheap fuel, limited coal mining before the Civil War. The salt and iron industries consumed most of the coal produced in the mountains of Kentucky and present-day West Virginia. Coal from along the Cumberland River was exported to the foundries in Nashville, averaging 2,100 tons annually between 1829 and 1834. By 1860, 50,000 tons were dug in this region. Smaller amounts came by raft down the Big Sandy. In 1840, 304,000 tons were mined in the Kanawha and upper Ohio River valleys (Moore 1991: 231–232; Rice 1970: 311, 315–317). In 1848, a scarce type of coal very rich in coal oil was found on tributaries of the Kanawha. Cannel coal was used for lighting either in unprocessed form or as coal oil. Between 1848 and 1861, approximately 1,500 gallons of oil were produced per day (Rice 1972: 124).

Copper, gold, lead, and zinc were also mined in the Southern Appalachians. Copper mining dated to prehistoric times and continued to be important in southwestern Virginia, eastern Tennessee, and the western Carolinas. Smelters began producing copper in Grayson County, Virginia, in 1832. One operation yielded 3 to 5 tons of copper daily in the late 1850's (Kegley 1979: 141–146). In the same decade, Cherokee workers built the Old Copper Road along the North Carolina-Tennessee border to transport copper to the railhead in Cleveland, TN (Dyer and Bass 1994: 24). By the 1850's, the owners and prospectors of copper mines were demanding rail lines through the mountains to improve transportation. Gold, silver, lead, iron, marble, slate, quartz, and porcelain clay also attracted speculative attention. In addition to opening pits in the ground, mining operations increased the demand for lumber, and smelters severely damaged vegetation and waters in their vicinity with acidic fumes (Inscoe 1989: 164, 170–171).

Gold mining erupted in northern Georgia in the 1820's after gold was discovered near Dahlonega south of present-day Chattahoochee National Forest (Davidson 1946: 265). In 1836, a United States mint opened in northern Georgia. It eventually coined over $6 million, part of the $17 million of gold mined during the rush. In the space of 20 years, town populations grew by the thousands, then shrank back to crossroads when miners moved on to California in 1849 (Elliot 1939: 252). In 1828, a similar gold rush began in Burke and Rutherford Counties, North Carolina, which lasted 5 years. Many of these miners also moved on to California. While mining in northern Georgia virtually ended with the California gold rush, it continued through the 1850's in North and South Carolina. A mine in Ashe County, North Carolina, operated as late as 1925. Gold mining could be very profitable. The most productive mine in North Carolina operated at a profit with a capital investment of $35,000 (Inscoe 1989: 66, 70–71). In 1843, Edmund Ruffin described a South Carolina mine that produced about $2,400 worth of gold per month (Ruffin 1992: 285–286).

The gold rush increased pressure for Cherokee removal to Oklahoma. Anti-Cherokee sentiment had been growing during the 1820's as settlers from Georgia and the Carolinas pushed for access to Cherokee lands. In 1829, the Georgia State Legislature laid claim to most Cherokee territory, voiding Federal laws and regulations to the contrary. In spite of a Supreme Court ruling in favor of the Cherokee in 1832, President Andrew Jackson refused to protect Cherokee rights and property. Harassment and illegal seizures of land led some Cherokee leaders to accept the Treaty of New Echota in 1835. The treaty exchanged land in present-day Oklahoma for Cherokee territory in the Southern Appalachians. Few Cherokee accepted the trade. As a result, most were forcibly removed by armed troops in 1838. More than 4,000 died on the march west, now known as the Trail of Tears. A small number of Cherokee escaped removal by hiding in the high mountains of western North Carolina. The descendants of these holdouts later became the Eastern Band of Cherokee Indians of North Carolina (Finger 1984).

Although the Southern Appalachians are frequently seen as isolated, the isolation of the region was relative during these years. With wagon roads and river travel the norm everywhere, the Southern Appalachians were only slightly less accessible than other parts of the country. As new types of transportation emerged, however, the mountains became less accessible compared to the lowlands. Steamboat service established on the upper Tennessee, the Kanawha, Licking, and Big Sandy Rivers was limited by the difficulty of

navigation on mountain streams. Residents of the highlands pushed for railroads, but few rail lines were laid before the Civil War except for local lines. However, the valley of Virginia, northern Alabama, and Knoxville, TN, acquired rail connections to coastal ports in the 1850's (Davidson 1946: 237–250; Gray 1958: 882–883, 894, 904, 916; McBride and McBride 1990: 599, 601; Rice 1970: 333; 1972: 217–218).

The economy of the Southern Appalachians between the American Revolution and the Civil War was complex and diverse. It ranged from nomadic activities, such as hunting and livestock droving, to small subsistence farms, large commercial farms, and industry. The social system that evolved with this economy was equally complicated. The stereotype of the mountaineer is a rough individualist, self-sufficient, and isolated from outside society (fig. 7). Many people in the Southern Appalachians fit this description and continued to fit it until the 20th century. Many others, however, were connected and involved with economic, social, and political affairs on regional and national levels.

Along with business enterprises and commercial agriculture came slavery. Although most mountaineers did not own slaves, a significant number of African Americans, mostly enslaved, lived in the mountains. Slavery was present to some extent in all parts of the Southern Appalachians. The Cherokee used slave labor on plantations they established in the early 19th century, and many Cherokee took their slaves to Oklahoma during removal in the 1830's (Perdue 1984: 27). In 1854, 11,000 slaves lived in east Tennessee, compared to 62,000 in middle Tennessee, and 44,000 in west Tennessee (Davidson 1946: 298). Slavery was notable in the Shenandoah Valley from the 1750's as eastern Virginians established plantations. In western North Carolina counties, slave populations ranged from 2.1 to 26.3 percent of the population in 1860. African Americans worked on farms and as drovers, but they were particularly important in nonagricultural enterprises, including mines, factories, and hotels (Inscoe 1989: 62–72). African Americans have been an integral part of Southern Appalachian history since the Spanish expeditions of the 16th century.

European settlement of the Southern Appalachians and the developments of the early 19th century brought immeasurable change to the environment and landscape. By the mid-18th century, market hunting had driven the last of the elk, bison, and bear into the mountains. Wolves, panthers, otter, muskrat, and mink were similarly restricted (Silver 1990: 100, 186). The last bison were killed before 1800 and the last elk by the 1850's (Lewis 1988: 21). Bounties placed on predators helped drive wolves and cougars toward extinction, whereas trapping greatly reduced the populations of fur-yielding animals. Hunting and competition for mast and forage from livestock put pressure on bear and deer populations. Overgrazing by livestock reduced the extent of canebrakes in the valleys, probably contributing to the decline of elk, bison, and deer. New plant species, escaped from gardens or spread by livestock, vied with native grasses and wildflowers for habitat. Logging around salt works, mines, and major rivers reduced forest cover in their proximity and increased the extent of secondary forests. In spite of all the changes, the Southern Appalachians still harbored large numbers of wild animals and uncut forests. Environmental modifications up to the Civil War were only a shadow of what was yet to come.

Civil War and Its Aftermath

The Civil War was a divisive period in American history, and nowhere was this more true than in the Southern Appalachians. While secession divided the South from the rest of the United States, it separated the Southern Appalachians from the rest of the South. It split mountain society into factions and broke mountain communities into opposing bands of armed guerrillas. Family members and neighbors became enemies. Even areas that escaped major battles were devastated; only a few lucky places avoided both the formal war and the internecine fighting.

Political divisions between the mountains and other southern regions existed throughout the antebellum period. In Virginia and North Carolina, political differences revolved around the western need for roads and railroads, which easterners either failed to support financially or opposed outright (Inscoe 1989: 152–176, Noe 1992: 305). Eastern Tennessee, at a political disadvantage to its more populous western portions, was connected economically to southeastern Virginia and the lower South (Bryan 1978: 12–13). Northern Alabama also differed from the remainder of the State in economy and politics (Thomas 1979: 50). The majority of Southern Appalachia shared Jacksonian Democratic politics that promoted equal representation and universal suffrage for white men.

Prounion feeling was highest in the northwestern section of Virginia. Unionists separated from Virginia in 1861, first as the State of Kanawha and, then, as West Virginia when Federal troops established control from the Kanawha River to Cheat Mountain and the Greenbrier Valley (Ambler 1988: 13–14, Stutler 1988: 35). Southwestern Virginia, linked by rail to the East, stayed with the Old Dominion. After Lincoln's election, the southwest took a wait-and-see attitude of "conditional unionism" or "conservative secessionism." After Fort Sumter, the district supported secession, but this support eroded quickly during the war. Depopulated and ruined by war and guerilla fighting, the counties bordering West Virginia became a part of that State in 1862. The remaining counties suffered increasingly severe shortages from military impressment, tax-in-kind, and disruption from war and conscription. Class tensions grew as the war came to be seen as "a rich man's war and a poor man's fight" (Noe 1992: 312–315).

Figure 7—Moonshiner in Pisgah Forest.

The experience of western North Carolina and northern Alabama closely mirrored that of southwestern Virginia. Political positions before the beginning of the war were not clear cut, but secession gained the upper hand once war seemed imminent (Thomas 1979: 50). In contrast, eastern Tennessee remained primarily unionist throughout the period and held two antisecessionist conventions after Tennessee left the Union. Only the southernmost counties of eastern Tennessee and a lone standout on its northern border, Sullivan County, supported secession (Bryan 1978: 23, 34–64). Kentucky began the war as a neutral State but was soon split into northern Union and southern Confederate halves. Its Appalachian regions experienced the war on much the same terms as the rest of the Southern Appalachians, with divided loyalties and internecine warfare (McBride and McBride 1990: 606–611).

Political divisions in the Southern Appalachians were strongly related to economic divisions. Counties in western North Carolina with strong business ties to South Carolina were primarily secessionist. The Cherokee remaining in North Carolina joined the Confederacy, probably influenced by their agent William Thomas who was a secessionist (Finger 1984: 82–100). The northwestern counties and those bordering Tennessee leaned toward unionism. Southeastern Tennessee and northern Alabama were oriented toward the slave-holding gulf region and supported secession (Inscoe 1989: 227, 247; Thomas 1979: 50). The split between unionists and secessionists was also perceived as a class division where slaveholders opposed subsistence farmers (Bryan 1978: 23–33, Inscoe 1989).

As the war progressed, politics became increasingly tangled. Those who were initially neutral shifted into one camp or another, depending on whether they had suffered most at the hands of the unionists or the secessionists. Others, weary and disillusioned, became neutral. By the end of the war, personal reasons of revenge or survival motivated most people in the mountains. Guerilla warfare, murder, and conscription by the Confederate army had decimated the population. Women, children, and the elderly suffered attacks, torture, and starvation. Theft, impressment, and disruption of agriculture and trade had caused widespread deprivation. Livestock were stolen by raiding parties and impressed by controlling armies with little or no compensation. In Cades Cove, the number of horses per farm was reduced from 6.1 in 1860 to 1.3 in 1880 (Dunn 1988: 76). Hog and corn production dropped by one-half in the Valley and Ridge province from Virginia to Chattanooga and by one-third in the Plateau region (Salstrom 1991: 273). Roads were not maintained and bridges were destroyed (Bryan 1978: 344–347, McKinney 1992). In eastern Tennessee and West Virginia, repeated military campaigns focused on railroads, rivers, and industrial developments, but most areas were equally hard hit (Bryan 1978, Stutler 1988: 35–38).

Civil War destruction contributed to widening divisions between the "upper" and "lower" classes (Salstrom 1991: 279). In Cades Cove, now part of the Great Smoky Mountains National Park, farm size dropped from an average of 83.98 acres in 1850 to 30.84 in 1880 despite a drop in population from 671 to 449 during the same period (Dunn 1988: 69). Because subsistence farmers held most of their wealth in livestock, the war affected them more than those with most of their capital in land. The war also disrupted the livestock industry in the mountains. Markets for Appalachian animals shrank with the end of the plantation system, and new sources of western beef bypassed the Appalachians. Adding to the economic troubles of western North Carolina, the tourist industry collapsed until the railroad to Asheville was completed in 1880 (Schwarzkopf 1985: 80–81). Many of the economic problems facing the Southern Appalachians were part of the economic depression affecting the entire South after the war.

Environmental changes accompanied the social and economic upheaval of the times. Mountaineers were forced to rely more heavily on game animals for food when their livestock were taken and their cropping disrupted (Dunn 1988: 131–133). The absence and loss of men during the war created labor shortages on farms. Women and children continued plowing and planting, but they lacked the work force to clear new fields when the old were exhausted. The resulting drop in yields exacerbated crop shortages and may have increased problems with erosion (McKinney 1992: 45, 55). Some regrowth of forest may have occurred as farms were abandoned and populations dropped, but military demands on the forest for game, timber, and new roads probably canceled out any gains. Additional demands were made on the forests when many of the cabins and outbuildings burned in raids were rebuilt.

At the end of the Civil War, the mountain people were left embittered. Long-term animosities gave rise to feuds that lasted for years (Bryan 1978: 347, Collins 1975: 168–172, McBride and McBride 1990: 611). These feuds contributed to the image of Southern Appalachia as a retarded frontier (fig. 8). Union sympathies in the mountains also fed stereotypes of the Southern Appalachian residents as throwbacks to the patriotic highlanders who defeated the British at Kings Mountain, NC, during the American Revolution. More and more, the rest of the country viewed the Southern Appalachians as a distinct region, separated from the rest of the country by rough terrain and strange, backward customs. This view justified missionary and reform movements focused on the southern mountains and its people (Shapiro 1978: 87–93, 105). The "hillbilly" stereotype also was used to justify the widespread expropriation of mountain resources during the late 19th and early 20th centuries (Eller 1982: 43).

Figure 8—Typical mountaineer's cabin near Junaluska Mountain.

Late 19th Century

Although farming in the Southern Appalachians recovered somewhat after the Civil War, the pattern of decline begun during the war would never be completely reversed. In spite of this deterioration, agriculture remained the principal source of livelihood in the mountains until after 1880. Traditional patterns of subsistence farming continued, supplemented by the barter and sale of corn, livestock, and forest products such as ginseng. Agricultural methods also remained stable, including open- range livestock keeping and intercropping corn with a variety of vegetables. Swine were still the chief export; farmers in the Southern Appalachians sold nearly 1¼ million hogs in 1880 (Eller 1982: 15–22).

The remaining Cherokee of the Southeast persisted alongside European and African-American newcomers. In addition to working their farms, the Cherokee kept up the fight for their lands in the Southern Appalachians. On July 19, 1868, the U.S. Congress recognized the Eastern Band of Cherokee Indians of North Carolina as a distinct tribe. The Qualla boundary was established in the 1870's, but the Cherokee did not receive a clear title until 1894. In 1884, after losses from war, disease, and ongoing emigration to Oklahoma, approximately 2,956 Cherokee lived in North Carolina, northern Georgia, eastern Tennessee, and northern Alabama (Finger 1984: 110–122, 105, 143, 171–172).

Continuity in mountain life masked the roots of deep and abiding change. Beginning in the 1870's, boosters of the New South promoted mountain resources to outside investors. Private speculators, who had become familiar with the area during military service or tourist trips, made exploratory visits to locate resources. Land speculation during the 1870's and 80's involved almost the entire range of the Southern Appalachians. Coal, timber, and iron attracted the most interest, but the economic depression of the 1870's slowed development (Eller 1982). During the 1880's, the tourist industry destroyed by war began to rebuild. The population

of Asheville, NC, grew from 2,600 to about 10,000 between 1880 and 1890. Similar growth as a result of tourism also occurred in other parts of the mountains. A renewed surge of wealthy visitors to the Southern Appalachians exposed even more potential investors to opportunities in the mountains (Eller 1982: 42–43, 101–103; Mastran and Lowerre 1983: xxiii; Schwarzkopf 1985: 81).

West Virginia and eastern Kentucky felt the impact of industrial development first. The Chesapeake and Ohio Railroad crossed West Virginia to Huntington in 1873 creating a boom for towns, sawmills, and coal mines. Coal mining expanded from concentration on cannel coal to include other types, particularly bituminous coal. The New River and Kanawha coal fields opened first. The Norfolk and Western Railroad soon followed, reaching the Smokeless coal fields of the Pocahontas Mines in 1883 (Tams 1963: 17–19). Most of the other major railroads in the Southern Appalachians were completed by 1900; however, railroad building remained important in the mountains well into the 20th century (Eller 1982: 65, McBride and McBride 1990: 630–631, Rice 1972: 223). Another important development in West Virginia's transportation network was the completion of a series of locks on the Ohio and Kanawha Rivers in the 1880's. Steamboats pushing coal barges and luxury boats carrying tourists made up most of the traffic through the locks. The steady growth of the transportation infrastructure led to a steady increase in coal production: 600,000 tons in 1870, 1,600,000 in 1880, 6,300,000 in 1890, and 21,500,000 tons by 1900. First tapped in the 1850's, West Virginia's oil and natural gas wells also grew in importance after the Civil War. Almost 300 were in operation by 1876 (Rice 1972: 225, 231, 246).

Coal mining in southwestern Virginia and eastern Tennessee remained small scale until after 1900, when it increased sharply (Eller 1982: 149). Southeastern Tennessee and northern Alabama expanded in importance as centers of iron production in the post bellum years. From its founding in 1871, Birmingham, AL, competed with Chattanooga, TN, for primacy in the iron and steel industry. By the 1880's, Birmingham was dominant because iron and coal were abundant in northern Alabama (Govan and Livingood 1977: 54–56). Charcoal-fired iron furnaces remained important in northern Alabama and northwestern Georgia through the early 20th century despite the introduction of coke-fired furnaces. New railroads opened access to new supplies of wood for fuel. The charcoal iron industry finally died out from a lack of iron ore and from competition with other centers of production rather than from a lack of wood (Williams 1989: 339–342). Mineral exploration led to mining after the Civil War in western North Carolina as it had in other areas of the Southern Appalachians. Coal was not plentiful in the Appalachian Summit of western North Carolina and iron was either inaccessible or low grade, but a variety of other minerals drew developers. The high-quality mica of the Black Mountains was the most heavily exploited. Other minerals included semiprecious stones, feldspar, kaolin, quartz, phosphate rock, and fluorite. The environmental impact of this mining was restricted to a few areas and was minimal compared to that of iron and coal mining (Schwarzkopf 1985: 82).

Like mining, lumbering followed the railroads. Shortages of lumber in the Northeast and Lake States by 1880 made the forests of the Southern Appalachians increasingly attractive. But no lumbering operation could be financially successful without rail or water connections. Charleston, WV, was the center of sawmilling in the State during the 1880's because of its access to both water transportation and railroads through eastern Kentucky and Tennessee to Cincinnati, OH. Several timber firms with operations in West Virginia, Kentucky, and Tennessee headquartered in the city (Clendening 1931: 103–104). The ever- widening network of rails also opened northern Alabama, northern Georgia, and western North Carolina in the late 1880's (Eller 1982: 99–100, Govan and Livingood 1977: 292–293, Pikl 1966: 9).

Speculators traveled with or in advance of the railroads. They purchased ridge land, timber rights, and mineral rights from farmers who rarely knew the true value of their property or the impact that mining and lumbering would have on their land. Between 1880 and 1900, investors from outside the region obtained most of the mineral and timber rights along the railroads. With the sale of these rights, many mountain farmers lost their agricultural livelihoods because clearcutting and mining reduced or destroyed the land's agricultural productivity. As a result, many mountaineers became dependent on wage labor in the mines and sawmills (fig. 9) (Eller 1982, Gaventa 1980: 53–55, McBride and McBride 1990a: 637). By the early 20th century, the decreasing amount of land available for farms and a growing population led to increased tenancy and decreased farm size. These changes would eventually end farming in the forests of the Southern Appalachians (Otto 1983).

The first phases of lumbering and mining did not disrupt the established economy. Employment was seasonal or temporary and supplemented rather than replaced farming incomes. Large-scale mining was restricted to a few regions, and lumber was cut selectively along rivers and the main lines of the new railroads. Therefore, environmental disruption was limited to the vicinity of a few mines and did not affect most farmers. Pervasive change occurred after 1890 as the infrastructure of railroads matured. The spread of big mining and lumber concerns was retarded by a financial panic in 1893, but companies founded during these years laid the foundation for an explosion of activity after 1900 (Eller 1982, Mastran and Lowerre 1983: 2–3).

The expansion of resource extraction in the Southern Appalachians increased concern for conservation of the

land and its resources. Although this concern began in the colonial period, the opening of western lands for American expansion delayed widespread concern until the second half of the 19th century. *Man and Nature* by George Perkins Marsh was the first influential publication cautioning against environmental waste. Published in 1864, Marsh's book both inspired and influenced government officials in their attempts to regulate resource use across the Nation. Motivated by decreasing lumber supplies in many areas and flooding in deforested watersheds, concerned individuals led by Franklin B. Hough organized the American Forestry Association (AFA) in 1875. Secretary of the Interior Carl Schurz joined Hough and the AFA in warnings about timber depletion. The work of Hough and his supporters led to the establishment of the Division of Forestry under the Department of Agriculture in 1881 (Steen 1976: 8–17). Although forestry bills had been introduced in Congress since the 1860's, the first bill did not pass until 1891. This bill allowed the President to proclaim forest reserves on public domain. Because public land was scarce in the East, the President could not establish forest reserves in the Southern Appalachians until the Weeks Law of 1911, which authorized purchase of lands (Steen 1976: 26–27, 122).

Inspired by the tourist industry, early proposals for parks and reserves in the Southern Appalachians began in the 1880's. On October 29, 1885, Henry O. Marcy, M.D., of Boston read a paper before the American Medical Association advocating a national park in the higher ranges of North Carolina for the benefit of invalids (Marcy 1885 quoted in Smith 1960: 38). The growth of the conservation movement paralleled developments in industry during the 1890's. Lumbering around tourist areas was drawing comment. In 1892, Charles S. Sargent responded by publishing a plan for a Southern Appalachian forest reserve in *Garden and Forest* (Sargent 1892). Also in the early 1890's, George Vanderbilt hired a young forester named Gifford Pinchot to manage his estate (Biltmore) near Asheville, NC. Joseph A. Holmes, State Geologist of North Carolina, suggested to Pinchot a reserve in the North Carolina mountains. In the same

Figure 9—Sawmill in George Washington National Forest, 1939.

decade, the North Carolina legislature and the North Carolina Press Association came out in favor of an Appalachian park (Smith 1960: 39–40). In 1898, Gifford Pinchot became the head of the Division of Forestry, bringing a concern for the forests of the Southern Appalachians into the Federal Government. Pinchot was replaced at Biltmore Estate by Carl A. Schenck, a German forester (fig. 10). Schenck founded a forestry school on the estate in an area that would become the nucleus for Pisgah National Forest. The Biltmore Forest School produced many State, Federal, and industrial foresters who helped shape American forestry in the 20th century (Jolley 1970: 10–11). Finally, in the closing months of the 19th century, the Appalachian National Park Association was inaugurated to work for a national park in the mountains of the Carolinas, Georgia, Alabama, Tennessee, and Virginia (Campbell 1960: 15, Smith 1960: 45–47).

By the end of the 19th century, profound change had occurred in the Southern Appalachian landscape (figs. 11a and 11b). The United States had consolidated its control of the region, leading to the acceleration of settlement and resource use from the ancient centers of human activity in the valleys to all but the most inaccessible mountain slopes. Subsistence agriculture and the free-range livestock industry, prominent during the first half of the century, were in retreat. Losses during the Civil War, increasing populations, and pressure from mining and lumbering interests restricted previous patterns of land use. Extinction and restriction of wildlife ranges coupled with the introduction of exotic plants and livestock caused widespread change in native ecosystems just as increased tourism brought the area to national attention. As a result, deforestation from lumbering, railroads, mining, and smelting drew concern from the fledgling conservation movement in the late 1800's. Most of the issues raised by 19th-century resource use remain. The developments of 19th-century industry and conservation would become familiar patterns in the 20th century.

Early 20th Century

New economic prosperity after the turn of the century accelerated the exploitation of Southern Appalachian forest and mineral wealth. The trend toward large holdings in the hands of outside interests continued, sometimes combining mining and lumbering interests in one company (Eller 1982: 93–102). A 1908 Government report on the Southern Appalachians estimated that 50 percent of its timberlands were owned by large companies (Wilson 1908: 36). Even after the activity of the late 19th century, large reserves remained nearly untouched. A 1901 report by W.W. Ashe and H.B. Ayers estimated that 75 percent of the Southern Appalachians was still forested and 10 percent was still in virgin growth (Ashe and Ayers 1901: 45, Mastran and

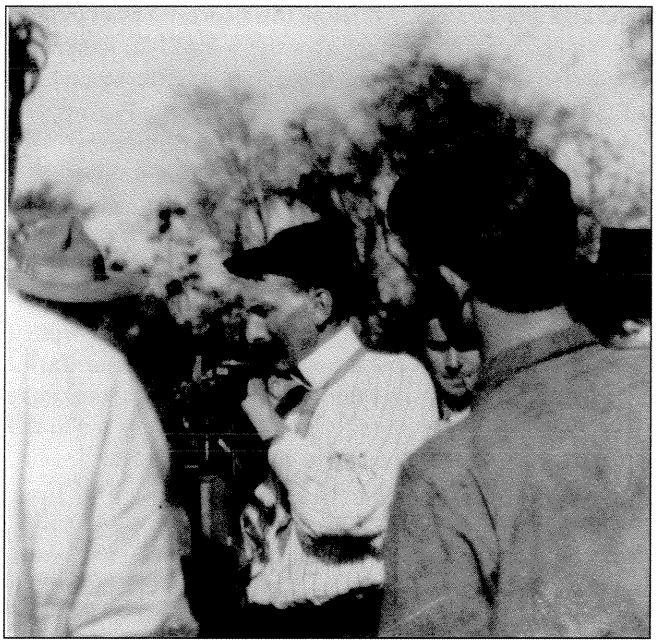

Figure 10—Biltmore Forest School group receiving instruction from Dr. Schenck (center). [USDA Forest Service photograph.]

Lowerre 1983: 8). From 1900 until the 1920's, this forest cover would be substantially reduced by heavy cutting. Sawmills served by narrow-gauge, logging railroads spread throughout the southern mountains, even to the spruce forests of the highest elevations (fig. 12). Overhead cables and yarding machines accelerated tree removal in the rough terrain, and new bandsaws accelerated milling. Mechanization increased soil leaching, erosion, flooding, and fire frequency (Lambert 1961: 357–359). In 1908, the Secretary of State's report estimated that 86 percent of the acreage in the Southern Appalachians was cleared, in various stages of regrowth, or in young secondary forests. According to the report "practically all of it, whether cut or not" had been burned (Wilson 1908: 24).

Logging began in the spruce forests of the Great Smoky Mountains and the Mount Rogers area in 1905 and on Mount Mitchell in 1912. Between 50,000 to 100,000 board feet per acre were taken from the vicinity of Mount Rogers. Spruce-fir stands in western North Carolina held less timber at 10,000 to 50,000 board feet per acre. Clearing at higher elevations increased the frequency of windthrow, causing even greater impact on the spruce forests. Most of Mount Mitchell was cut over, and much of it was burned. Although logging did not end until 1922, Mount Mitchell was designated a State park in 1915. It gradually reforested in spite of continued windthrows and fires (Pyle and Schafale 1988, Schwarzkopf 1985: 82–92).

Hardwoods were cut in the lower elevations: poplar, walnut, cherry, oak, and ash. Chestnut was valued for lumber and tannin. As cutting progressed, smaller trees were cut down to 15 inches in diameter by 1905 (Mastran and Lowerre 1983: 8–9). Logs half that diameter were used for pulpwood

(Schwarzkopf 1985: 84). A contemporary estimate of the total cut in the 16 mountain counties of North Carolina in 1909 was 327 million board feet, or 105 million board feet per acre of forest (Holmes 1911: 17). Similar cutting occurred throughout the Southern Appalachians. A large splash dam built across the Big Sandy in 1909 was particularly effective for log transport (fig. 13) and the saleable hardwoods of the Big Sandy basin were depleted in 10 years. A few remote slopes escaped logging and fire, but many mountainsides were left denuded. In West Virginia and eastern Kentucky, the lumber industry was superseded by the coal industry during the early 20th century. By 1909, the lumber boom was declining, and, by the 1920's, most lumber companies had moved to other regions (Eller 1982: 104–112, 126–127; Mastran and Lowerre 1983: 8–9).

In addition to hastening deforestation, the economic upswing after 1900 tripled the production of coal in the Southern Appalachians. By 1930, the region supplied 80 percent of the nation's coal. Eastern Kentucky and southern West Virginia continued to be the chief coal regions, with secondary centers in southwestern Virginia and eastern Tennessee. The population of the coal counties in southern West Virginia increased 400 percent between 1890 and 1920. Hundreds of small mines employing 10 to 300 men ran coal camps throughout the hollows. The small operators competed with the large companies that eventually dominated the industry in West Virginia and eastern Kentucky. By 1910, U.S. Steel and the Pennsylvania Railroad controlled the important Flat Top-Pocahontas fields through interlocking company directorates. After 1915, a few large firms dominated the industry and the countryside with their company towns (Conley 1960: 234–235, Eller 1982: 128–153). Increased demand for coal during World War I fueled further expansion of the coal industry. Both the number of mines and the rate of production per mine rose to meet the needs of wartime industry. Peak years of production occurred between 1915 and 1926.

In the 1920's, unstable coal markets led to decreased profits. Coal companies responded by cutting wages and increasing mechanization. Workers responded with strikes; the resulting labor unrest and violence as companies sought to quell unionization further disrupted the industry. When the Great Depression hit, the industry collapsed (Conley 1960: 36–37, Eller 1982: 153–160). The social consequences of the coal industry in the early 20th century have excited more comment than the environmental consequences. The effects on workers' health was particularly terrible and grew worse with mechanization. Black lung, silicosis, and pneumonia caused by inhaling mine dust took many lives (Etheridge 1989: 1394). Nevertheless, the environmental effects were obvious. Large holes gaped in the mountainsides accompanied by piles of mine wastes, and coal dust coated the landscape. Poor sanitation in the towns and acid runoff from mines and railroad cuts polluted the water. Fish, game, and plant populations were greatly reduced in mining districts by both the effects of mining and the immense jump in human numbers. Demand for mine timbers and railroad ties contributed to the clearing of forests, and coal companies were often consolidated with lumber companies (Eller 1982: 161–162, Mastran and Lowerre 1983: 6). A new method begun in 1914, strip mining, would cause even more environmental disruption in later years (Conley 1960: 41).

Although not as large as the coal industry, the copper and iron industries also grew during the early 20th century. In eastern Tennessee and northern Georgia, the acid fumes from copper and iron production killed thousands of acres of forest. The acids and accompanying loss of vegetation killed wildlife and fish, damaged streams, and increased erosion and silting. This industry was largely gone by World War I, but the devastation remained. In western North Carolina, mica and kaolin mining continued through the twenties, and some of the booming textile industry spilled over into the mountain counties of the Carolinas, Virginia, and Tennessee. Other industries dependent on the lumber industry produced furniture, rayon, paper, and leather. Production of these commodities contributed to resource use, pollution, and environmental change in the Southern Appalachians. However, the end of the lumber boom after World War I slowed their growth and virtually ended leather production in the southern mountains (Eller 1982: 123–126, Mastran and Lowerre 1983: 6).

The industrial development of the Southern Appalachians gravely affected the inhabitants of the mountains, both human and animal. Mountain lions became so rare that many thought sightings were figments of the imagination (Bolgiano 1995). The last wolf in Virginia was shot in 1910. Beaver vanished and bear, wild turkey, and deer were nearly gone. Native trout populations decreased sharply because deforestation caused silting and warmed streams. Attempts to restock fish populations in the 1930's compounded the problem by introducing rainbow trout from California. Rainbow trout out-competed native brown trout in many streams (Lewis 1988: 22, Sarvis 1992: 6–7). By 1912, the chestnut blight had struck Virginia (fig. 14). In the mid-1920's, it spread through the Southern Appalachians, changing the composition of the forests forever (Hepting 1964: 11–12). In 1912, another event critical to the mountain landscape occurred—the European wild boar arrived. Brought in to stock a hunting preserve, the boar escaped and are now exotic nuisances in the Great Smoky Mountains (Frome 1980: 274–275).

Forest farming traditions also suffered. By 1930, only 60 percent of Southern Appalachian lands were in mountain farms, and the population was increasing. The average farm was reduced to 76 acres. Lumbering and industrialization had destroyed the livestock industry by destroying the

Figure 11—Big Creek in the Biltmore Forest (a) before logs splashed down creek toward river and (b) after.

b

forest range. Company towns, usually supplied from outside the region, did not provide significant markets for mountain farmers. Without markets, farmers had no income to sustain agricultural intensification with chemical fertilizers. Consequently, the productivity of mountain farms declined as erosion and soil exhaustion grew worse. Tenancy and part-time farming combined with wage labor became prevalent (Eller 1982: 230–231, Otto 1983: 24–25). Exceptions did exist. The farmers of Cades Cove bought machinery and improved livestock during these years. Because no railroad ever reached the cove, large-scale lumbering never disrupted traditional farming practices. Sawmills were located close enough, however, to provide wage labor to cove residents who wanted it. Few neighborhoods were so lucky (Dunn 1988: 225–228).

Early Conservation in the Southern Appalachians

The conservationist response to the rapid depletion of resources in the Southern Appalachians was immediate but took some time to have an effect. In 1902, the National Hardwood Lumber Association and the National Lumber Manufacturer's Association endorsed creation of a Southern Appalachian forest reserve. Large corporations favored a reserve; the government's purchase of cutover lands would relieve them of tax responsibility for the property and promote reforestation for future supplies. In 1905, the AFA also endorsed the concept of reserves in the Appalachians. When the Appalachian National Park Association, renamed the Appalachian National Forest Reserve Association in 1903, disbanded, the AFA took up the effort to establish national forests in the East (Mastran and Lowerre 1983: 16). Severe floods, such as those on the Monongahela and Ohio Rivers in 1907, heightened public concern for watershed protection. Proponents of eastern forest reserves used the need for watershed protection to push for passage of the Weeks Act in 1911 (Eller 1982: 117, Steen 1976: 96–97).

The Weeks Act cleared the way for the establishment of national forests in the East. Because the authority to purchase land for these forests was connected to the protection of navigable streams, only land in the White Mountains and the Southern Appalachians was considered (Young and Mustian 1989: 12). In 1911 and 1912, 11 national forest purchase units were designated in the Southern Appalachians including portions of Georgia, North Carolina, South Carolina, Tennessee, and Virginia. Virgin timber covered 30 percent of the land purchased in the first 5 years. The remaining land was partially or completely cutover, and the proportion of purchased lands cutover rose with time. Most areas were depopulated and out of the hands of local residents, but some were caught in a web of overlapping land titles. The National Forest Reservation Commission chose not to use condemnation to acquire these lands, fearing it would cause ill will and undermine public support for conservation. Most conflicts were resolved, but

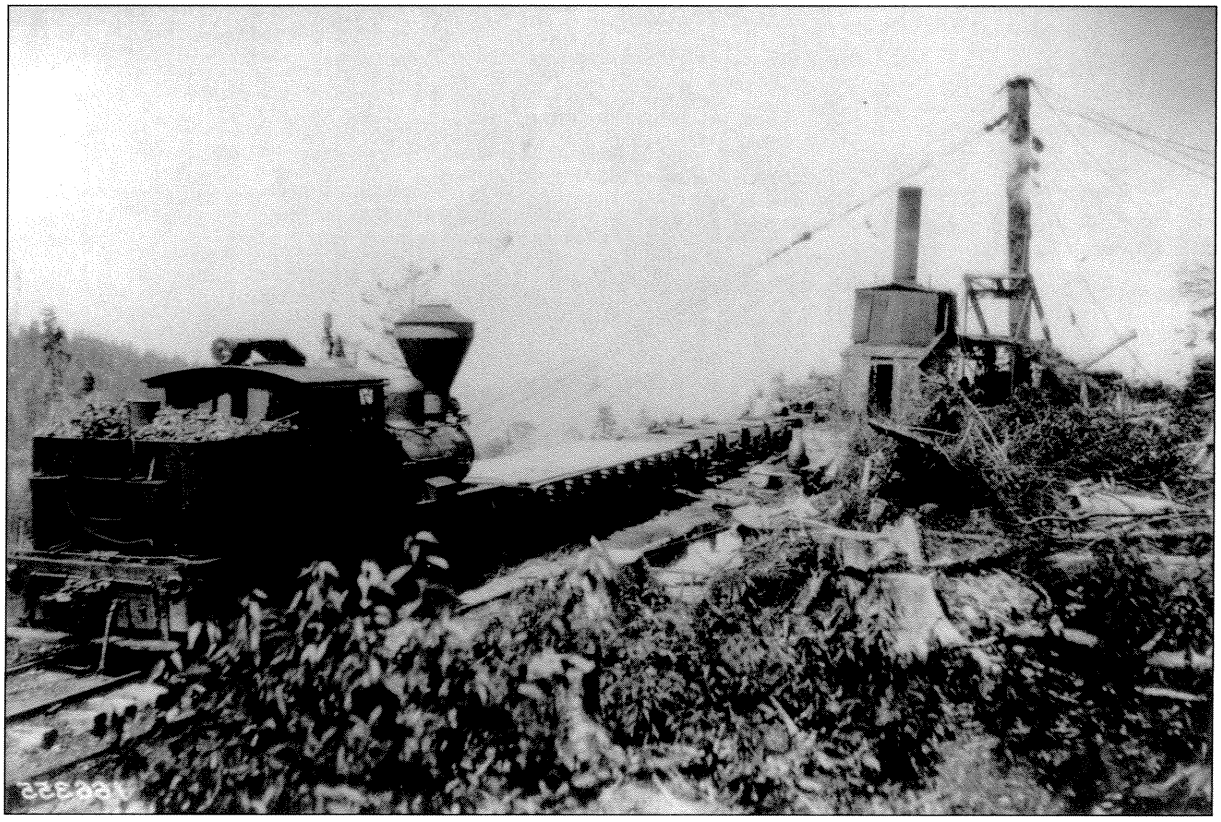

Figure 12—Lidgerwood high lead skidder and Shay locomotive used for logging in the Pigeon River watershed in western North Carolina. (USDA Forest Service photograph.)

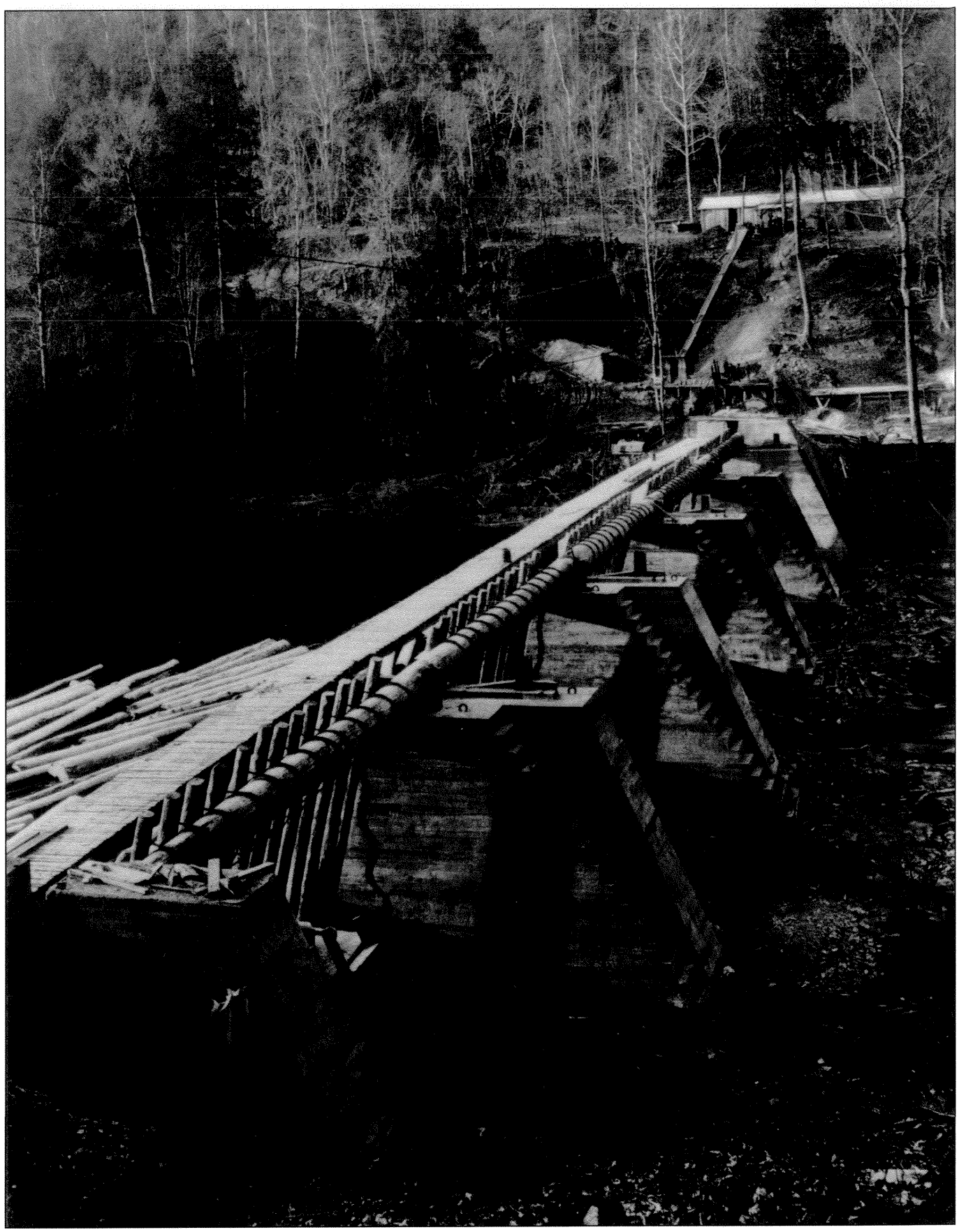

Figure 13—Great splash dam of the Yellow Poplar Lumber Company on the Big Sandy River, Virginia.

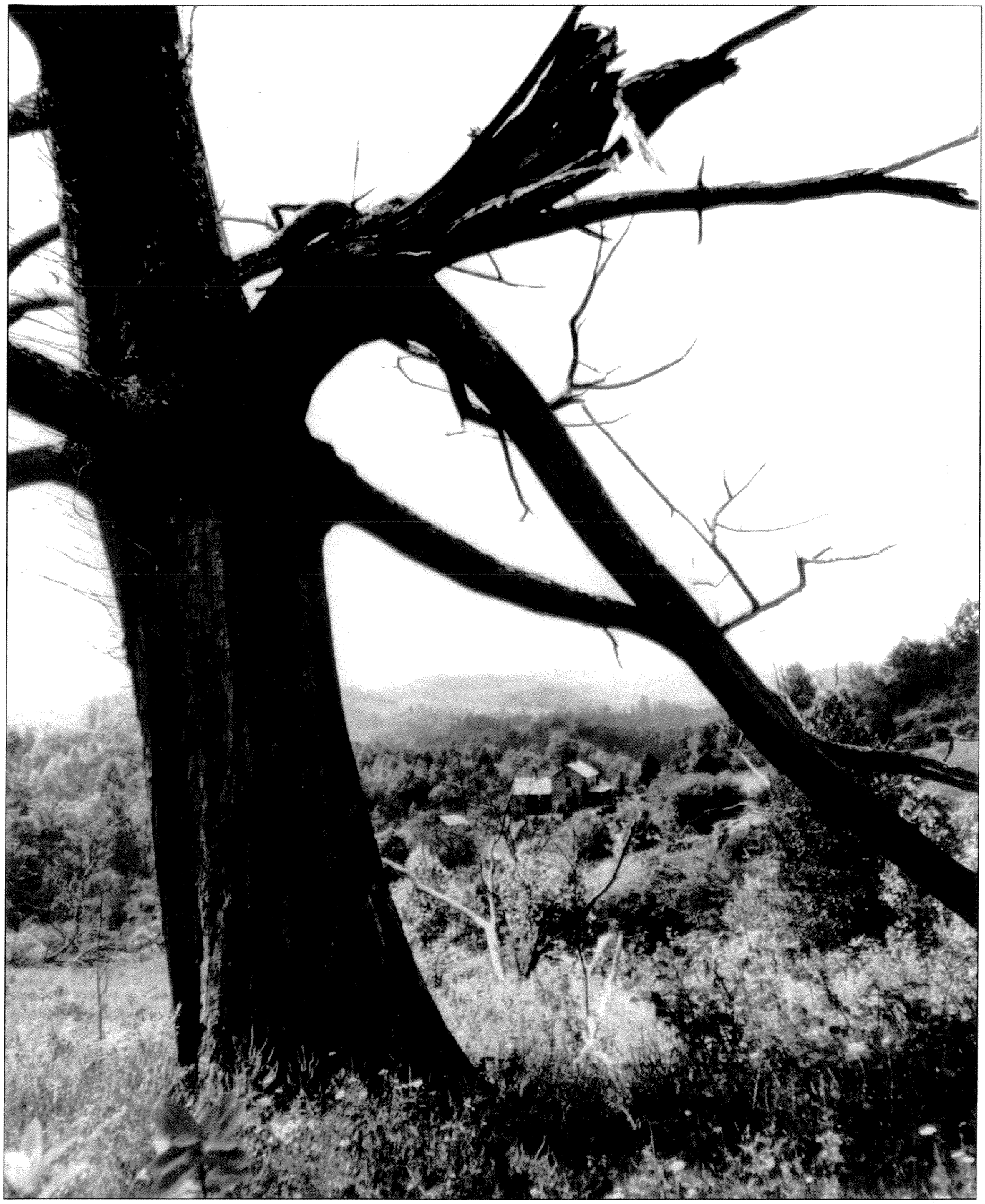

Figure 14—Dead chestnut on a typical Blue Ridge plateau.

title difficulties led to abandonment of the Smoky Mountain Purchase Unit. In 1923, a movement proposed designating this area as a national park (Mastran and Lowerre 1983: 23–27, Young and Mustian 1989: 12–14).

Between 1911 and 1916, the U.S. Department of Agriculture (USDA) Forest Service purchased much of the land that became Pisgah, Nantahala, Chattahoochee, Cherokee, and Jefferson National Forests. The Vanderbilt estate provided the foundation of the first eastern national forest, Pisgah, proclaimed in 1916 (fig. 15). In 1918, northern Alabama received its first national forest, now known as the William B. Bankhead National Forest. The Monongahela National Forest in West Virginia became official in 1920. When the Chattahoochee, Sumter, and Talladega National Forests were proclaimed in 1936, the boundaries of the purchase units and forests in the Southern Appalachians approximated their present form (Anon. 1952, McKim 1970: 8, Mastran and Lowerre 1983: 29). These were joined by the Cumberland National Forest of eastern Kentucky, later renamed the Daniel Boone National Forest, in 1937 (Collins 1975: 203).

During the 1920's, Congress passed additional legislation facilitating the expansion of national forests in the East. The Clarke-McNary Act of 1924 allowed the purchase of land for timber growing. It also broadened joint Federal-State work in fire protection and forestry. In 1925, the Weeks Law Exchange Act eased consolidation of national forests by allowing the trade of titles to land within forest boundaries for comparable land elsewhere (Mastran and Lowerre 1983: 29, Young and Mustian 1989: 17). Legislation passed during 1928 appropriated more money for land purchases and authorized forestry research and surveys.

The renewed movement for a national park in the Southern Appalachians gathered momentum through the 1920's. Support for national parks was building on the national level. After the Organic Act of 1916 created the National Park Service, Director Stephen T. Mather and Assistant Director Horace M. Albright considered the Southern Appalachians as one of the first sites for a new park (Frome 1980: 178–179). The Secretary of the Interior formed the Southern Appalachian National Park Committee in 1924 to study the question. More than 20 sites were under consideration, including the Great Smokies, the Grandfather Mountain-Linville Gorge region, and the Skyland district of the Shenandoah. Finally, in 1926, Congress passed a bill authorizing the creation of two parks in the Southern Appalachians: Shenandoah National Park and Great Smoky Mountains National Park. A third eastern park was also

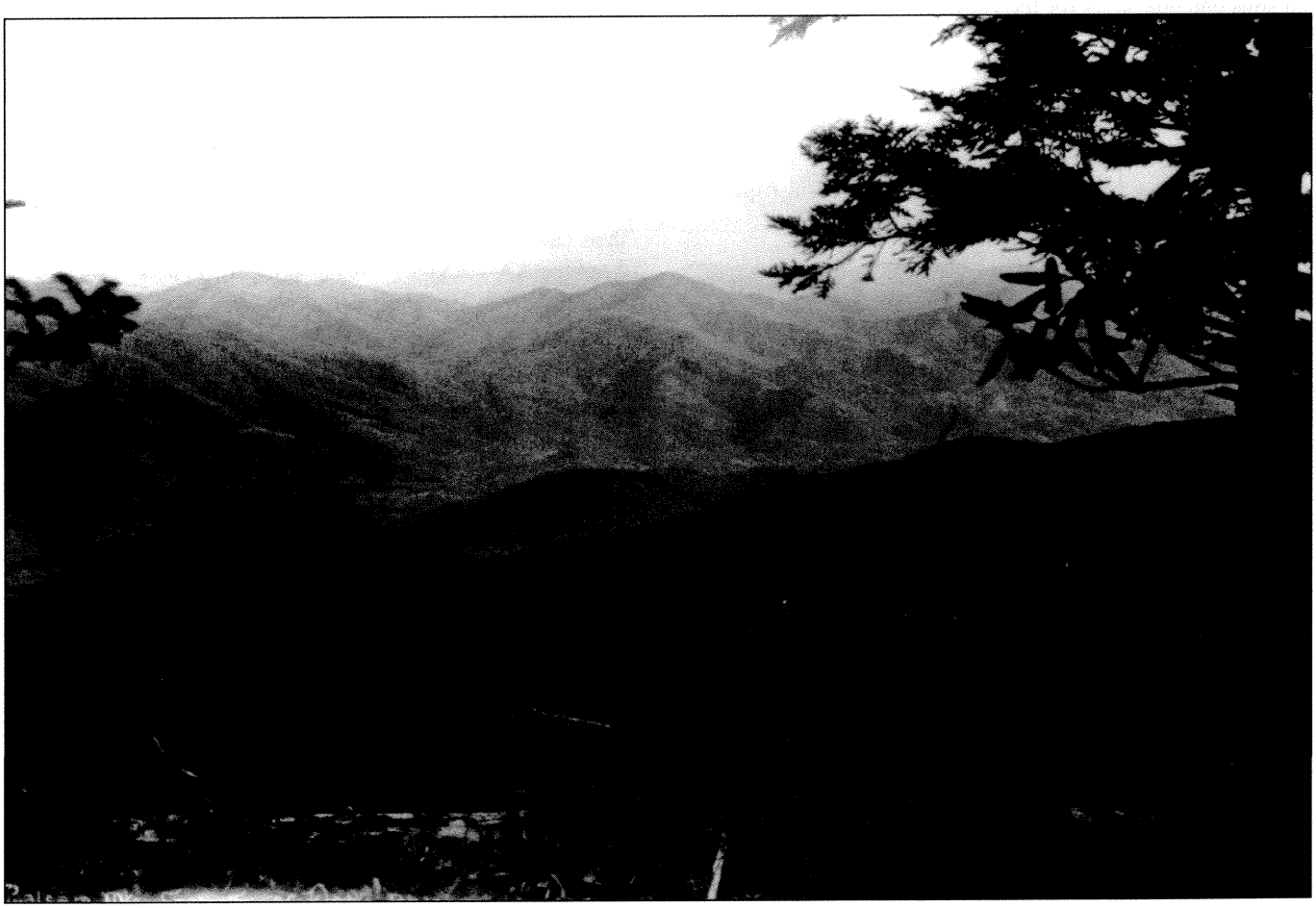

Figure 15—Pink Beds, part of the Biltmore Estate in 1895, is an attraction in the Pisgah National Forest today.

included: Mammoth Cave National Park in Kentucky. A long period of land acquisition and political struggle ensued. The final dedications did not occur until 1936 (for Shenandoah) and 1940 (for the Great Smoky Mountains) (Campbell 1960: 22–30, 44–45; Lambert 1989: 173–207).

Mountaineers continued to graze livestock, hunt game, and cut wood on the ridges. Traditional forest uses and range burning conflicted with the management objectives of the USDA Forest Service. Since 1898, the Department of the Interior had banned grazing on forest reserves except in the Pacific Northwest (Steen 1976: 65). The Division of Forestry, which became the USDA Forest Service in 1905, regulated the cutting of forests, and free use of timber by residents was considered a privilege rather than a right (Steen 1976: 59). Many of the national forests in the Southern Appalachians were game preserves in cooperative agreement with the States (Mastran and Lowerre 1983: 28, Satterthwaite 1993: 13–14). Fire control was another high priority in the new national forests, and little distinction was made between wildfire and fires used to manage the forests (fig. 16). As with wildlife, fire control was a joint effort between State and Federal officials. A successful tactic in promoting these changes in forest use was the employment of local residents as forest rangers. Local rangers acted as liaisons and educators for the communities surrounding the national forests (Mastran and Lowerre 1983: 32–37, Sarvis 1993: 171–172, Steen 1976: 135–137). Nevertheless, conflict continued and grew as Federal land stewardship expanded. When the Depression drove thousands of people back onto the land in the Southern Appalachians, Federal land policy would reshape the society and the landscape of the Southern Appalachians once again.

Great Depression and New Deal

Federal land acquisitions contributed to the decline of farm acreage and population in counties where they were made, especially in northern Georgia. Land condemnations for the new national parks created opposition to Federal activities by mountaineers. But Federal agencies also provided employment for local residents, which became increasingly important as agriculture and industry declined during the 1920's and collapsed with the Depression. Both the positive and negative aspects of the Federal presence intensified during the 1930's. In terms of conservation, the Depression accomplished what the USDA Forest Service had been unable to do: it reduced timber cutting throughout the Southern Appalachians (Mastran and Lowerre 1983: 38–39, 44). The slowdown in mining and other industries reduced pressure on mountain resources and environment, but subsistence agriculture became a major cause of land degradation in the 1930's.

In the coal-producing counties, the mill towns, and the cities, many people lost their jobs and joined the movement back to the land. Farm acreage remained steady during the Depression, but the number of farms increased to about 400,000. Because most farms were too small to allow fallowing and fertilizer was too expensive, farmers eked out a precarious existence from exhausted and eroding fields (Kirby 1987: 99–100, Mastran and Lowerre 1983: 44–46, Otto 1983: 25). Timber and mine country were hit hard because populations were higher and the land had already been damaged by industry. The valley regions, which continued to rely on mixed farming of grain, dairy, and livestock, were more prosperous. A few neighborhoods raised fruit and vegetables or tobacco for sale, and the northern portions of Georgia and Alabama adopted the cotton culture of the Piedmont (Kirby 1987: 87–95).

New Deal reforms led to the purchase of large quantities of land by the Federal Government. National forests expanded using New Deal money to buy out farmers and company lands. Many companies sold only the surface rights to the government, retaining the mineral rights. At the time, this arrangement was agreeable to both parties, but in later decades it would become a source of conflict. In 1933, three new programs augmented USDA Forest Service and National Park Service activities in the Southern Appalachians: the Agricultural Adjustment Administration (AAA), the Tennessee Valley Authority (TVA), and the Civilian Conservation Corps (CCC). The AAA bought "submarginal" farmlands and resettled farm families on better farms elsewhere. This program was moved to the Resettlement Administration, then to the Farm Security Administration, and later died of insufficient funding under the Bureau of Agricultural Economics. Because funding was insufficient, many farm families received payment for their land but no further aid. Because the money from the sale of their land was often not enough to pay for a new farm, help from the AAA actually worsened the financial situation of some families. Most of the land removed from farming went to the national forests and parks, but many tenant farmers remained on Federal land. The National Park Service moved the mountaineers off park lands, but the USDA Forest Service allowed them to stay on the national forests (Kirby 1987: 57–60, Mastran and Lowerre 1983: 48–51).

The TVA had an immense impact on the Valley and Ridge province from southwestern Virginia through eastern Tennessee to northern Alabama. Dam-building projects provided employment for thousands of people, supplied electricity to some mountain counties, and helped control flooding (Lowitt 1989: 365–366). Nevertheless, resentment toward the Federal Government increased when dam projects flooded scarce high-quality farmland in valleys, displaced many families, and condemned much of the land. Some reformers had long advocated moving mountaineers out of the mountains and into the cities and towns where it was assumed they would be better off. Whether intentional or not, New Deal policies often had this effect as large portions of many mountain counties became public property (Eller 1982: 120, 240; Mastran and Lowerre 1983: 51–52).

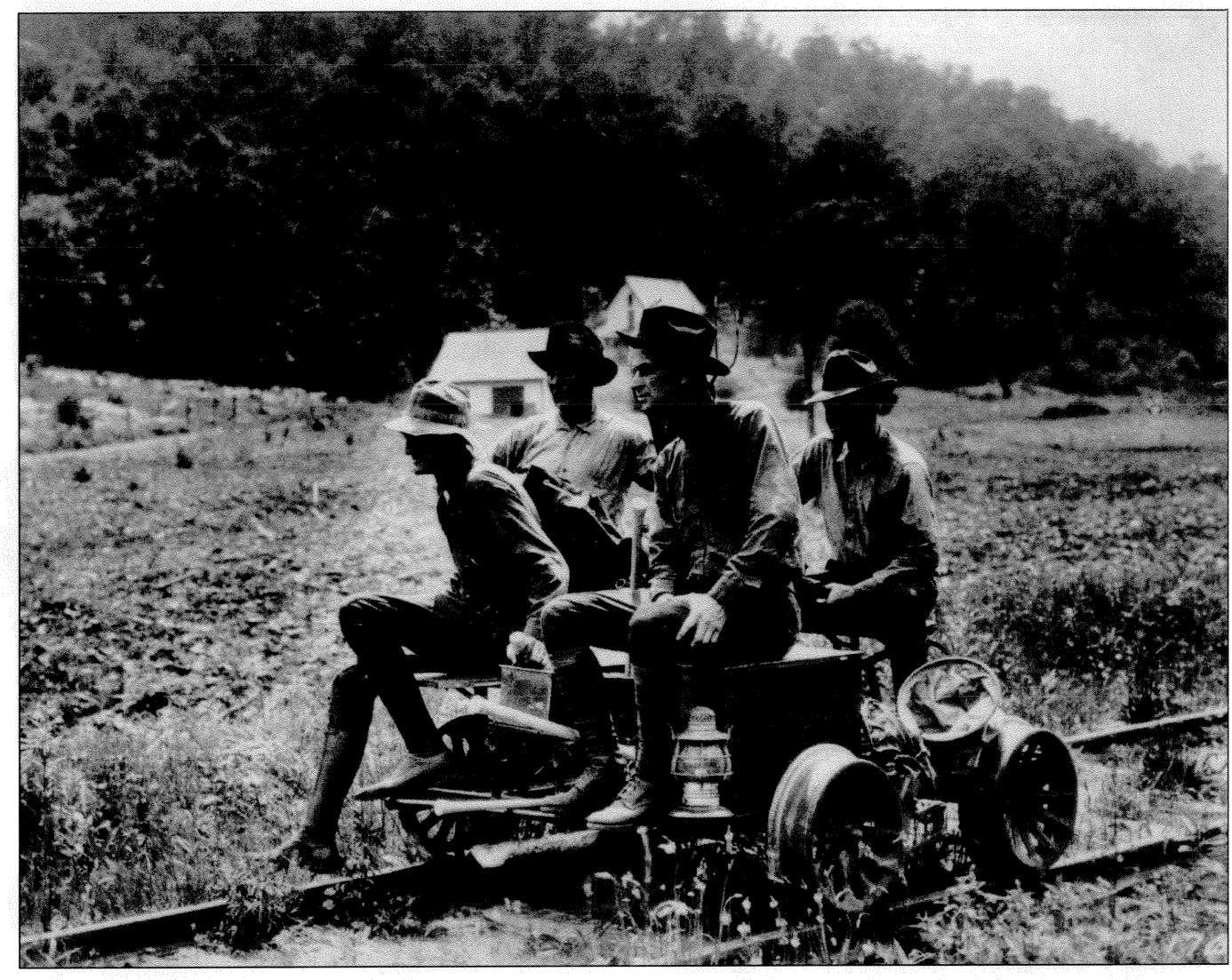

Figure 16—Pisgah National Forest crew riding to fire.

Unlike the mixed reaction to and results of other government programs, certain programs were widely popular. The CCC, the Federal Emergency Relief Administration (FERA), and the Works Progress Administration (WPA) made President Roosevelt a hero in many homes. The first beneficiary of this labor supply was the USDA Forest Service, which remained in charge of at least half of the CCC men until the program ended in 1942. The first CCC camp was located on the George Washington National Forest. At this camp and many others throughout the Southern Appalachians, men planted trees (fig. 17); improved timber stands; built recreational facilities, trails, and telephone lines; and worked as firefighters. The TVA, the National Park Service, the newly established Soil Conservation Service, and various State parks employed the CCC for similar work. Some workers came from the northeastern cities, but many were native to the area or the State. Some graduated from the CCC to jobs in the USDA Forest Service (Kirby 1987: 56–57, Mastran and Lowerre 1983: 71–80, Satterthwaite 1993: 17–18).

Civilian Conservation Corps and FERA jobs with the National Park Service in the Southern Appalachians were also popular. The Blue Ridge Parkway and the Skyline Drive were welcomed both for immediate employment opportunities and for future tourism. However, although up to 1,200 people were employed at a time, the roads were not welcomed universally. The Cherokee of western North Carolina refused to allow the parkway across their lands. After weathering land allotment and tribal disbandment plans in the 1920's, they were not eager to part with any more land. The parkway eventually was built on an alternative route through Cherokee land that did not destroy the farming communities of Soco Valley (Jolley 1969: 55, 93–101; Neely 1992: 30). Many other landowners in the Great Smoky Mountains National Park and along the Blue Ridge Parkway also refused to sell. Grants of lifetime tenure were made to some of these individuals, but many others were evicted. Even when lifetime tenures were granted, communities were destroyed. Ironically, the National Park Service later found that it valued the

Figure 17—Civilian Conservation Corps reforestation project in eastern Tennessee. (Courtesy Morehead Ranger District, Daniel Boone National Forest.)

agricultural landscape of some communities and began to maintain them artificially, minus the inhabitants (Dunn 1988: 241-257, Madden and Jones 1977).

With some exceptions, the Depression years were good for the environment of the Southern Appalachians. The consequences for mountain communities were mixed at best. Depression-era work programs reforested land and reduced erosion and fires. The slump in industry slowed pollution and depletion of resources. Government policies dislocated communities but reduced land degradation in the process. The ambiguous record of these years created some additional management problems for foresters and park rangers. Unhappiness with the government from loss of homes and loss of hunting and fishing rights or conflict over moonshining was sometimes expressed through arson. Paradoxically, fires were sometimes set to create work opportunities for firefighting crews (Sarvis 1993: 34). Rangers who handled situations with tact generally had fewer fires in their districts (Hays 1993: 20–26, Satterthwaite 1993: 9).

Another significant event, facilitated by the growth of Federal and State lands during the 1930's, was the completion of the Appalachian Trail (fig. 18) from northern Georgia to Maine in 1937 (Foster 1987: 12). A less beneficial aspect of park, trail, and road development born in the thirties was the increasing access to formerly remote areas. While few parts of the Southern Appalachians were ever truly untouched by humans, national forests, parks, and parkways brought more people and people brought automobiles. Robert Marshall expressed concern as early as 1934 that the parkway would destroy wilderness areas (Jolley 1969: 78).

The growth of government participation in conservation included a growth in research. The Southern Appalachians had attracted scientific curiosity for centuries, usually combined with a colonizer's eye for profits. Botany, geology, geography, and zoology interested many early European writers. The earliest well-known account was written by John Lederer in the mid-1600's. Naturalists Mark Catesby, John Bartram, and his son, William Bartram, included the Southern Appalachians in their wanderings of the 1700's. From France, Andre Michaux and Francois Michaux traveled to study the plants of these mountains. In the 19th century, Asa Gray, Arnold Guyot, John Fraser, and many others investigated the region (Schwarzkopf 1985: 14–19). In the late 19th century, forestry arrived with Gifford Pinchot and Carl A. Schenck; mycologists and pathologists began studying in the Southern Appalachian forests around 1890, and the USDA Forest Service continued this work. The chestnut blight drew most of the attention in the early 20th century, but the arrival of the CCC shifted attention to the effects of stand improvement work on tree diseases (Hepting 1964).

The founding of the Appalachian Forest Experiment Station in 1921 and the Coweeta Experimental Forest in 1934 provided evidence that the fields of geology, climatology, soil science, zoology, botany, agronomy, and hydrology were becoming important scientific endeavors (fig. 19). Experiments on the effects of timber management on wildlife and the use of fire in timber management led to important policy decisions (Young and Mustian 1989: 29, 33–34). The fledgling discipline of archaeology received funding as a relief project in the 1930's, and the work marked the beginning of the modern era of archaeology in the Southeast (Coe 1983: 165–170, Haag 1985: 272–280).

The widespread clearcutting and farm abandonment of the late 19th and early 20th centuries resulted in large expanses of even-aged forest. Stands containing several age classes developed on sites where previous management or selective cutting had occurred (Young and Mustian 1989: 27). The chestnut blight had removed one dominant species from the landscape, whereas the introduction of the European wild boar and rainbow trout provided new ones. Water pollution, stream silting, and dam projects changed aquatic ecosystems, sometimes beyond recognition. However, in places once devastated by mining and lumbering, new national forests and parks had begun to moderate human impact on the land. Reforestation and wildlife restocking programs attempted to reverse the worst excesses of the late 19th and early 20th centuries. New research aided conservationist efforts as did labor provided by New Deal programs. Resource use and environmental change in the Southern Appalachians had become a national issue and would remain one.

World War II and the 1950's

During World War II, conservation work slowed, and the demands of industry on the Southern Appalachians increased. By 1942, the CCC had been disbanded due to lack of manpower. The military and wartime industry absorbed the unemployed into the national war effort. Government funding for national forests, parks, and other conservation projects dried up as resources were redirected into military channels. In the national forests, timber cutting increased to meet wartime demands while timber stand improvement work and planting declined to pre-CCC levels. Wood was needed for a multitude of military uses: construction projects, railroad ties, aircraft, truck beds, ships, packing crates, cellulose for dynamite, glycerol for nitroglycerin, wood plastic, rosin, and turpentine (Steen

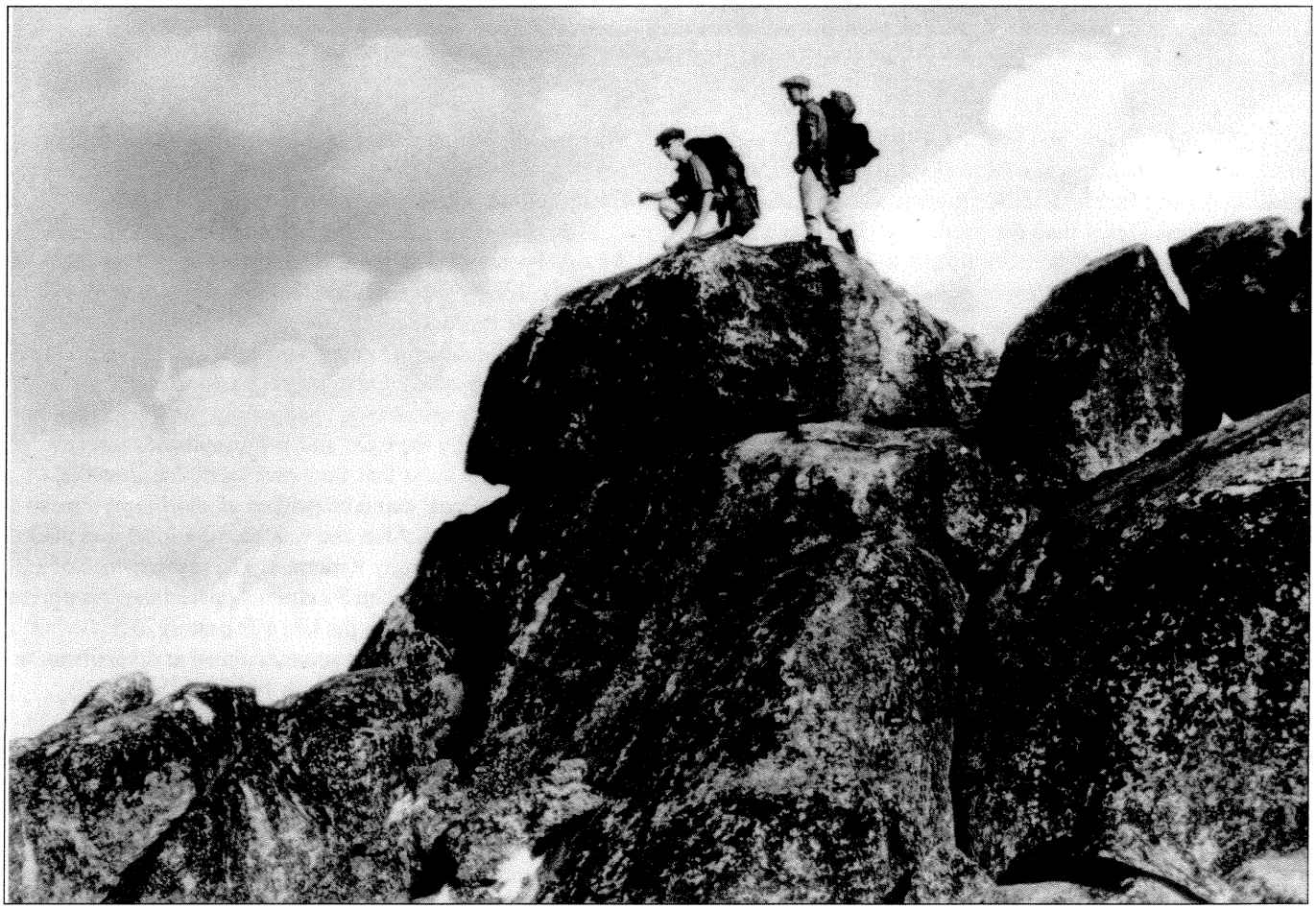

Figure 18—Above the clouds on Sharp Top Mountain on the Appalachian Trail.

Figure 19—Research biologist at work in the Coweeta Experimental Forest. (USDA Forest Service photograph.)

1976: 246–247, Young and Mustian 1989: 31–32). Even inferior trees previously passed over were salable. In spite of the enormous demand, timber growth in the southern mountains was higher than the overall cut. But much of this growth was in young secondary forests not ready for harvesting (Mastran and Lowerre 1983: 95).

With the booming economy of the war years, the number of abandoned farms in the Southern Appalachians increased. Millions of people left the southern countryside and migrated to cities and industrial work (Kirby 1987: 304–305). After the war, these lands contributed to an expansion of Federal holdings in the mountains (Otto 1983: 26). Wartime emigration and economic opportunities gradually improved relations between mountaineers and the government land managers of the Southern Appalachians. By the end of World War II, arson cases had dropped dramatically in the Great Smoky Mountains National Park (Hays 1993: 27). National forests also experienced a decrease in fires during and after the war. With the dependence of the military on wood and wood products, destruction of woodland through arson was equated with sabotage, even drawing the interest of the Federal Bureau of Investigation. In the Jefferson National Forest of Virginia, fires dropped 46 percent in 1941, 25 percent in 1942, and another 20 percent in 1943 (Sarvis 1993: 58). During the war, tourism was almost nonexistent. Skyline Drive in the Shenandoah National Park averaged only three or four cars per day. Bus trips from Washington, DC, were organized to fill the gap (Lambert 1989: 264–265).

Jobs reappeared in mining and lumbering as well as in urban factories. Ninety percent of the timber sales during World War II were less than $500, allowing mountain inhabitants to operate small lumbering enterprises in addition to working for lumber companies. Labor shortages encouraged mechanization, especially in coal mining. As trucks and the new roads built by the CCC and WPA replaced railroads, mining began in areas that were previously inaccessible. Small seams of coal could be worked as short-term mines and then abandoned. After the war, the new machines made strip mining increasingly important. The reemergence of extractive industries in the Southern Appalachians reinforced economic trends begun in the late 19th century and undermined Depression-era projects aimed at diversification (Caudill 1963, Currens and Smith 1977, Mastran and Lowerre 1983: 95–98, Rice 1972: 241).

One Depression-era agency, the TVA, remained an important employer throughout the period. The power-generating projects of the TVA met the increasing need for electricity while employing 42,000 people in the Southern Appalachians in 1942 and 1943. One large project spurred on by the war effort was Fontana Dam on the Little Tennessee River on the

edge of the Great Smoky Mountains National Park. Dam construction began in 1942 and lasted 3 years. Upon its completion, the TVA transferred 45,920 acres of land between Fontana Lake and the park to the National Park Service. A condition of the transfer was that the National Park Service would replace a stretch of highway flooded by the lake. The highway has not been built to this day because conflict continues over pollution from the acidic Anakeesta rock that would be exposed in construction. Tennessee Valley Authority power plants also contributed to the demand for coal. Critics charged that TVA coal use encouraged strip mining in the Southern Appalachians (Campbell 1960: 132, Mastran and Lowerre 1983: 98–99).

In 1943, the TVA initiated programs against water pollution in response to the growing populations and industrialization of the Tennessee Valley. The agency was particularly concerned with untreated domestic waste and industrial wastes from paper and textile mills in southwestern Virginia, western North Carolina, and eastern Tennessee. However, the TVA proceeded cautiously, not willing to antagonize municipalities or industries. The TVA decided to participate in stream surveys and water pollution control only when requested to do so by the State of Tennessee. As a result, the TVA played a minor role in water quality control through the 1960's (Schaffer 1989).

Demand for coal declined during a postwar economic depression, although the TVA power plants provided one steady market. As the economy recovered, mineral rights retained by mining companies on land sold to national forests began to present a new arena of conflict. Mining companies began to request permits to strip-mine coal deposits in the national forests in 1953, when the Stearns Coal and Lumber Company sought access to deposits on the Cumberland National Forest. The request was denied throughout repeated appeals, and the company abandoned the project in 1955 (Collins 1975: 263–269). Mineral management also became a problem in the Monongahela National Forest during and after World War II. Strip mining occurred in the Monongahela during the 1950's, as did oil and gas drilling (McKim 1970: 51–52). Other national forests in the Southern Appalachians had fewer problems with managing mineral resources.

Continuing mechanization forced more people to migrate out of the coal-producing regions in search of work. Blue Ridge populations remained stable, but the populations of the Valley and Ridge province of eastern Tennessee increased as its cities grew. Most migrants were young, which led to a "graying" of mountain populations. The relationship between Federal land ownership and out-migration is unclear. While many counties with a high proportion of national forest land did have high rates of out-migration, their rates were no higher than many counties with little or no national forest acreage. In contrast, counties with high percentages of national park land had high rates of population loss, primarily because park land was closed to mountaineers' use (Brown and Hillery 1962, Mastran and Lowerre 1983: 101–103).

Management of the national forests in the Southern Appalachians kept many of its prewar features. Multiple-use management, first propounded in the Copeland Report of 1933, directed attention toward timber, water, range, recreation, wildlife, research, State aid, and fire protection, among its many aims (Steen 1976: 201–202). Fire control (fig. 20), reforestation, and timber stand improvement remained top priorities. Forestry efforts of the previous decades resulted in improved stocking and growth of the forests. By the early fifties, 4,121,000 acres of southern national forests were in upland hardwoods, primarily in the mountains. Wildlife programs remained popular, especially with local residents who had traditionally relied on hunting for part of their subsistence as well as for recreation. Timber sales policy continued to emphasize small sales to local loggers, both for the benefit of the mountain economy and for the benefit of national forest public relations. This policy also reflected the changing structure of the logging industry in the 1950's. Small portable mills and trucks allowed small operations to compete with large corporations. Like miners, loggers were able to reach areas unsuited to railroads and tap resources too limited for large companies. Foresters continued to contend with tenants on national forest lands. Most were allowed to stay by paying small permit fees (Mastran and Lowerre 1983: 114–119, Satterthwaite 1993: 21, Young and Mustian 1989: 35–37).

The biggest boom to affect the Southern Appalachians in the postwar years was the growth of the tourist industry. The completed portions of the Blue Ridge Parkway received 1½ million visitors in 1947 (Craig 1948: 200). Recreational use of national forests in the Southern Appalachians and across the Nation increased astronomically between 1945 and 1960 (fig. 21). An exchange of lakeshore property in the Nantahala National Forest of North Carolina for nearby forest acreage allowed the construction of a resort hotel on Lake Santeelah. Most recreational facilities were small-scale camping and picnicking areas constructed by the CCC during the thirties, but some forest land was leased for private vacation cottages. To some extent, the USDA Forest Service was forced into recreational management in response to the staggering growth of tourism. For the first time, water and game were given priority over timber production in some districts. Overuse of existing facilities caused increasing problems with water pollution, litter, fires, and destruction of vegetation (Mastran and Lowerre 1983: 107–112).

The growth of recreation was also reflected in the continuing development of the Appalachian Trail. Sections of trail that had fallen into disrepair during the war were rebuilt, and trail maintenance organizations were reformed. New construction projects aimed at absorbing postwar economic reductions threatened sections of the trail and

remote areas of the Southern Appalachians with further exposure to outside development. Proposed extensions of the Blue Ridge Parkway into northern Georgia would have affected 75 miles of the trail and opened thousands of acres to tourism. Opposition to this extension eventually led to the movement to transfer the Appalachian Trail into public stewardship (Foster 1987: 13–14).

The National Park Service felt similar pressure from increasing tourism, but with fewer conflicts over management priorities. Because recreation was always one of the prime features of the national parks, the primary conflict was between recreation and preservation. This conflict was illustrated when tree growth obscured scenic vistas along Skyline Drive in Shenandoah National Park, and a program of clearing began to restore the views. This decision drew criticism from conservationists for cutting healthy trees in a national park, but the practice continued. The park received 1½ million visitors in 1955 (Lambert 1989: 265–266, 268). Visitors to the Great Smoky Mountains National Park rose in number from a low of 383,116 in 1943 to 4½ million by 1960 (Campbell 1960: 143). Like the national forests, the national parks began to face the effects of increasing numbers of people.

Figure 20—Cooling down a burning log along fireline in the Cherokee National Forest.

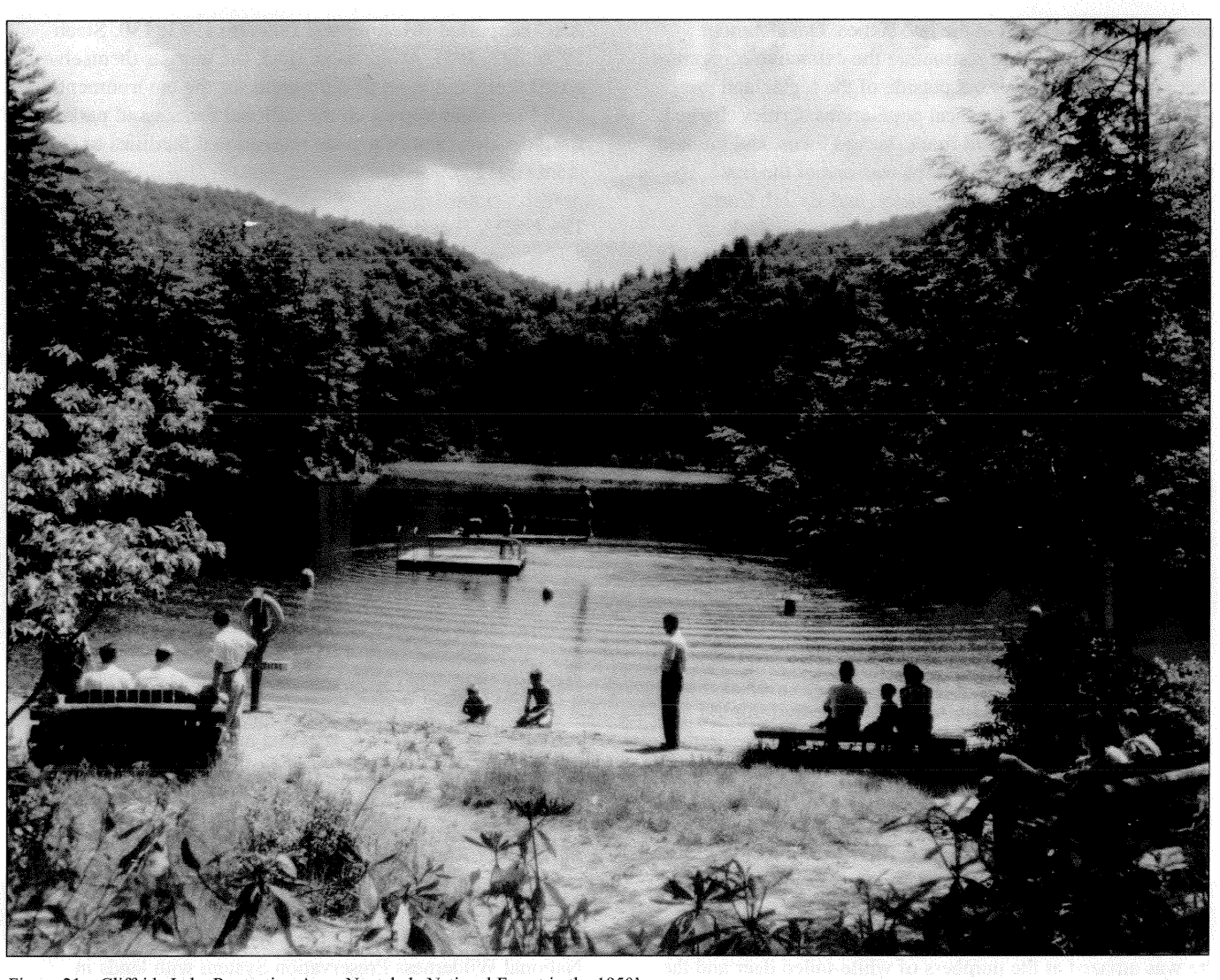

Figure 21—Cliffside Lake Recreation Area, Nantahala National Forest in the 1950's.

Recent Decades

The Southern Appalachians after 1960 were both a new place and an old one. From northern Georgia and Alabama to the Shenandoah and beyond, the ancient mountains still stood. But in the coal fields, the very mountains seemed threatened with destruction from strip mining and the subsidence of ground above collapsing mine shafts. New roads and machinery spread mining and logging into previously remote corners of the region. Loggers, at least, could use these developments to spread their impact more thinly across the landscape, but fewer areas were completely immune from the chainsaw. The continued prevalence of extractive industries in the southern mountains left the residents more vulnerable to economic trends than in areas with a varied economy. In 1960, Appalachia was rediscovered by the Nation, this time less as a "retarded frontier" than as a "depressed area," a Third World region within the boundaries of the United States. Appalachian incomes were lower and unemployment rates were higher than in the rest of the country. The United States as a whole was 70 percent urban compared to 44 percent in Appalachia. Education levels and living standards were lower in these mountains than elsewhere, and working-age adults were still leaving the area in large numbers (Appalachian Regional Commission 1973: 21–22).

In response to these conditions, President Kennedy appointed a task force to study the problem. The task force proposed the Appalachian Regional Commission (ARC), which was established under President Johnson in 1964. The ARC and other programs of Johnson's "War on Poverty" attempted to help mountaineers with strategies remarkably similar to New Deal programs: work corps, road building, and economic programs designed to remake the mountain economy in the image of more diversified regions (Gaventa 1980: 127). Many of the employment programs constructed recreational facilities, roads, trails, and buildings on national forests, improved timber stands and habitats, and worked to control erosion and fire. Funding, never adequate for the goals of the

programs, was reduced in the late sixties. Development programs often failed to restructure the extractive economies that sent profits to investors outside of the region and provided few benefits for local populations. Critics charged that the programs misspent funds, lacked focus, and ignored the neediest areas. The Job Corps was one of the few programs that was generally popular, and six Job Corps Centers remained in operation in Southern Appalachian national forests through the 1980's (Gaventa 1980: 129–131, Mastran and Lowerre 1983: 126–136). The ARC's environmental programs focused on air pollution, erosion control, land-use planning, mining, solid waste disposal, timber, and water (Appalachian Regional Commission 1973).

The TVA received increasing scrutiny after 1960 for its role in altering river drainages and criticism for its annual purchases of coal provided by strip mining. In 1965, the TVA instituted a requirement for reclamation of strip-mined land into its coal contracts but received continued criticism for inadequate enforcement. By 1974, the agency required mining companies to submit land restoration plans with their bids to supply coal (Clark 1984: 98–99). As strip mining became more prevalent through the sixties and seventies, controversy over the practice also grew. Court actions between the USDA Forest Service and mining companies resulted from strip-mining plans on national forests, particularly in wilderness areas after the mid-1970's (Mastran and Lowerre 1983: 172–173).

In the national forests and parks, wildlife and fish-stocking programs were showing signs of success as animals multiplied in the mountains. When a new chief ranger arrived at the Shenandoah National Park in the late 1950's, he was amazed at the numbers of white-tailed deer and the mere presence of bear, beaver, and wild turkey (Lambert 1989: 268). At the same time, acid runoff from mining and road construction, erosion from logging and construction, and rising water temperatures from forest clearing were damaging aquatic habitats. Exotic introductions such as the European boar and rainbow trout threatened native plants and animals, posing difficult management questions. Other species, like cougar, wolf, and elk, seemed permanently lost. More recently, the possibility of cougars surviving in the mountains has received increased attention (Bolgiano 1995).

After 1960, multiple-use planning on the national forests became increasingly difficult, as reflected by the passage of the Multiple-Use Sustained-Yield Act of 1960. This act helped clarify USDA Forest Service policy and, thereby, balance the many demands on the national forests. One difficulty faced by the USDA Forest Service was the growing conflict between recreation and logging. New tourist facilities brought more and more vacationers into the region who objected to the effect of logging on the landscape; but loggers pushed for higher cutting limits to provide more jobs to local residents (fig. 22), a position the ARC supported (Mastran and Lowerre 1983: 130, Steen 1976: 297–302). At the same time, the tourists themselves posed more and more of a problem for the environment, both from their impact on the national forests and parks and from development of private recreational facilities to serve them (fig. 23).

The USDA Forest Service has faced other changes and subsequent public reaction. In 1963, even-aged management became national forest policy and common practice in the Southern Appalachian national forests. Because even-aged management involves clearcutting patches of forest, it created heated controversy over the effects on forest composition and wildlife habitat. The conflict culminated in the Monongahela Decision of 1974 wherein a Federal judge decided the USDA Forest Service was violating the Organic Act of 1897. The 1897 act permitted the harvesting of only dead or mature trees. This ruling prompted Congress to pass the National Forest Management Act of 1976, which allowed clearcuts within guidelines designed to protect the environment. Dissension continues among environmentalists and resource managers over methods and amounts of timber cutting (Roth and Harmon 1995: 12–13, Young and Mustian 1989: 36).

Another source of controversy that arose during the 1960's was wilderness areas. In 1956, Senator Hubert Humphrey made the first attempt to protect wilderness through laws. Both the USDA Forest Service and the National Park Service initially opposed the bill, but, after John F. Kennedy's election, both services actively supported wilderness legislation. With Kennedy's endorsement, Congress passed the Wilderness Act in 1964. The Wilderness Act created a National Wilderness Preservation System with lands in national forests and parks. Thereafter, disagreements arose between different interest groups and agencies as to what land and how much should be designated wilderness. In 1973, National Park Service recommendations that 80,000 acres of Shenandoah National Park become wilderness led to local opposition. Local leaders hoped for an entrance into the park and Skyline Drive through the affected area. Wilderness advocates criticized the National Park Service for compromising with local communities and allowing access roads. In spite of the political difficulties, the bill approving the Shenandoah Wilderness passed in 1976 (Lambert 1989: 271–272). Similar disputes continue between wilderness advocates and opponents over roads in the Fontana tract of the Great Smoky Mountains National Park.

The Eastern Wilderness Act of 1975 designated five wilderness areas in Southern Appalachian national forests. One is in the Daniel Boone National Forest of Kentucky; the remaining four are in the Appalachian Summit subregion of the Carolinas, Georgia, and Tennessee. The National Wild and Scenic Rivers System, created in 1968, is similar to the National Wilderness Preservation System.

As in wildernesses, development and access are restricted along designated wild and scenic rivers. Two rivers in the Southern Appalachians have been affected: the New River and the Chattooga. The Chattooga River's designation as wild and scenic generated considerable conflict. Fifty-seven miles of river and 16,400 acres of land were involved, and while land acquisition was not contested, the new restrictions on river access caused considerable protest. Area residents feel that the interests of urban visitors to the river are placed above those of locals. In addition, the Big South Fork of the Cumberland River in the Daniel Boone National Forest became a Kentucky Wild River in 1972 and is administered by the State. The wild status of the Big South Fork was protected through a political compromise that replaced a planned hydroelectric dam on the site with a national recreation area under the National Park Service. Wild and scenic classification also protected the New River in North Carolina from hydroelectric development, first as a State scenic river and then by the Federal Government in 1976. The designation of these two rivers was accomplished with relatively little dissension (Mastran and Lowerre 1983: 153–156).

These same issues of preservation versus use and local versus national interests caused controversy in the development of national recreation areas (NRA). In the early sixties, plans were prepared for the Mount Rogers NRA in Virginia. Disagreements over land condemnations, land zoning, and the environmental impact of the planned development of a ski area and a parkway enveloped the NRA in discord by the 1970's. As a result, the USDA Forest Service scaled down plans and limited development to campgrounds, picnic areas, and interpretive sites (Sarvis 1994). Land acquisition was a point of contention for other projects during this era. The National Trail Systems Act of 1968 provided for the purchase of easements to protect the Appalachian Trail from encroaching towns and recreational development. In the Southern Appalachians, most of the trail was already protected, and most land acquisitions were cordial. However, lack of clarity in the act itself led to procedural disagreements between the National Park Service and the USDA Forest Service. The administrative problems were resolved by amendments passed in 1978 (Mastran and Lowerre 1983: 157–158).

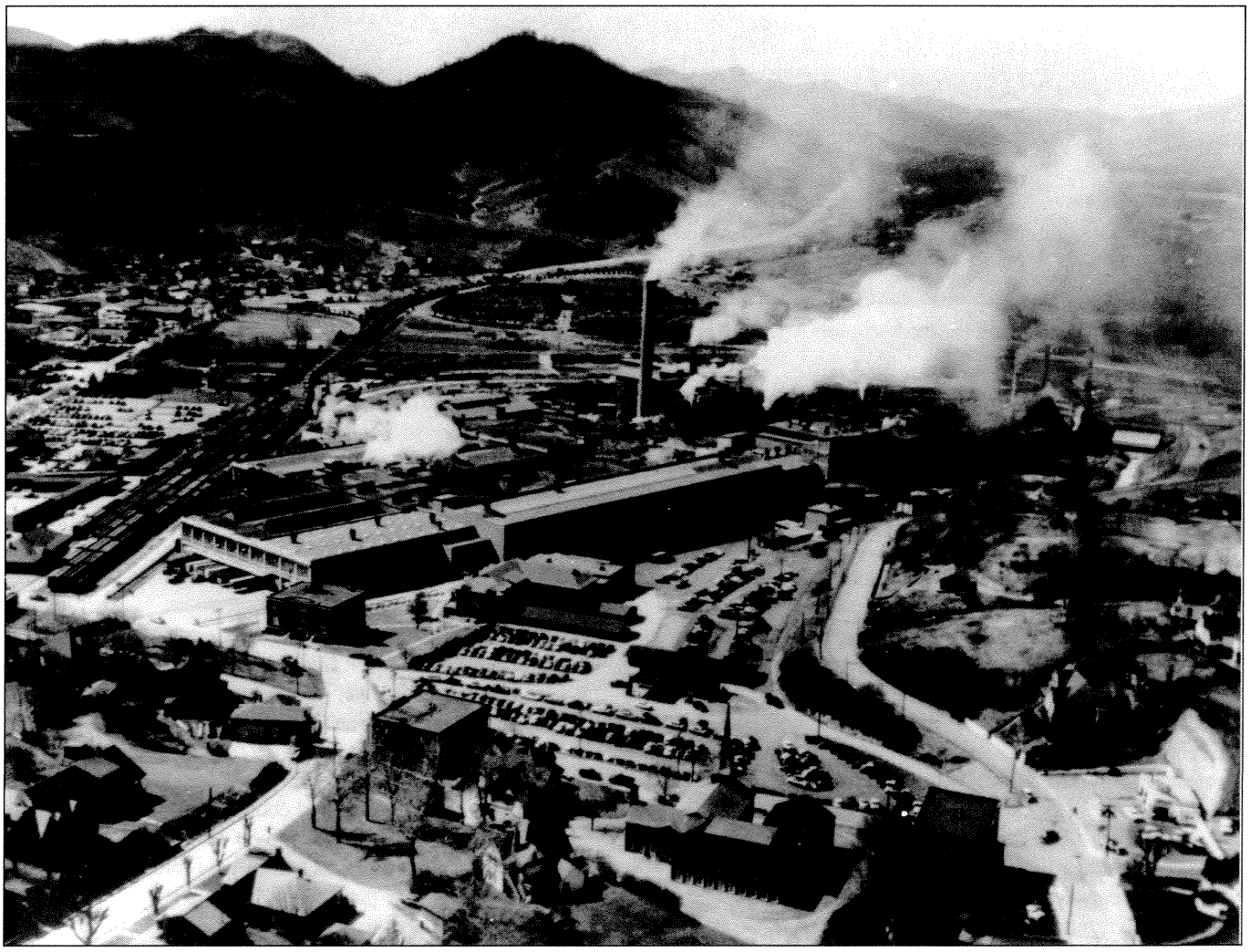

Figure 22—Champion Carolina, a paper mill, in the late 1950's or early 1960's.

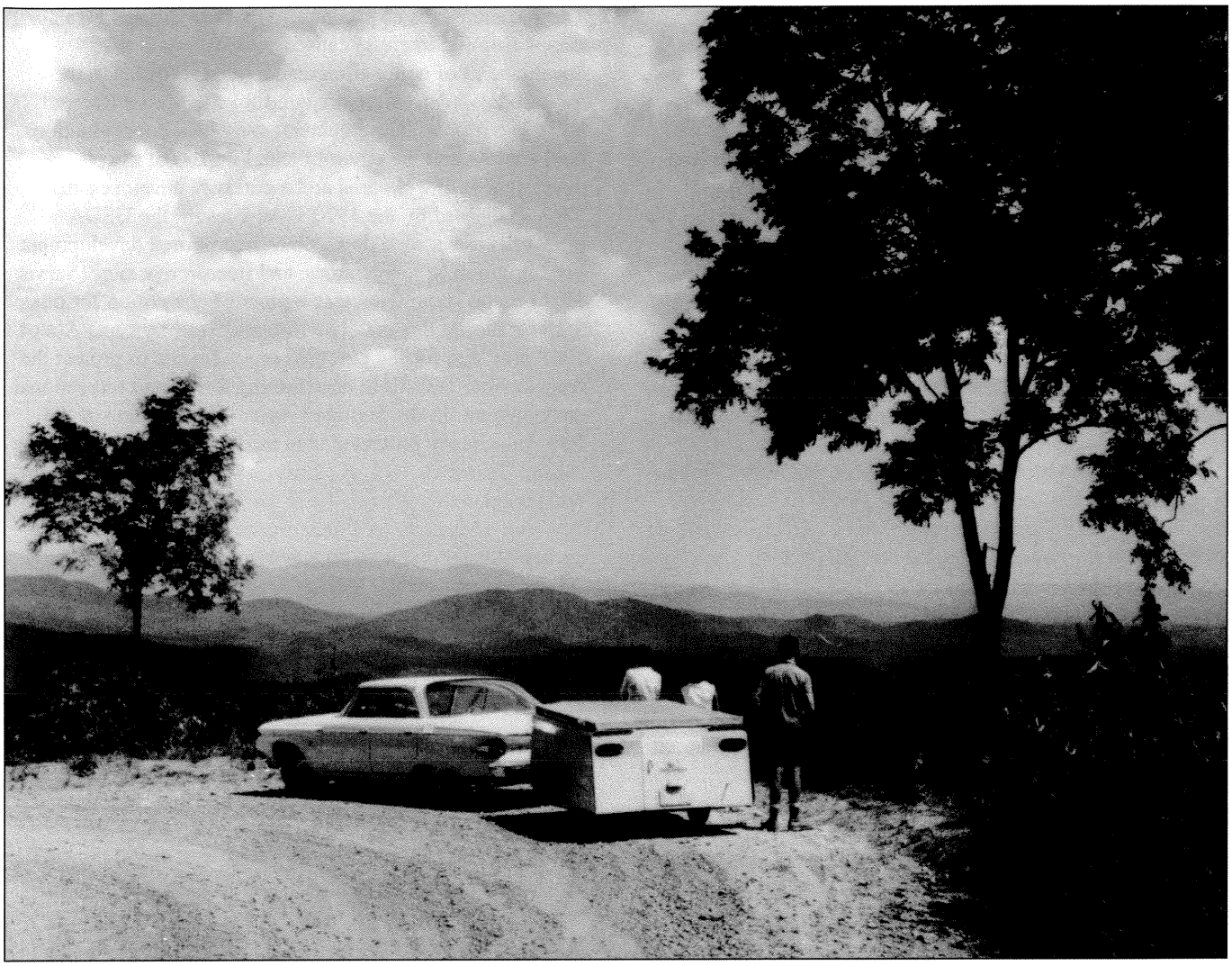

Figure 23—Scenic overlook on Potato Patch Mountain, Chattahoochee National Forest.

Land condemnations, such as those in the Red River Gorge of Kentucky, and wilderness designations under the Roadless Area Review and Evaluation brought a great deal of protest from mountaineers. Lumbermen and those holding timber-related jobs feared loss of employment from the removal of forest from timbering. Other mountain residents resented additional Federal intrusions into their communities. Owners of inholdings in proposed wilderness areas feared loss of their land. Citizens groups also protested the lost revenue to county governments, the exclusion of motorized vehicles—a problem for older forest users— and the influx of outsiders. For the most part, dissent followed legal channels, but arson as a method of protest was revived as well (Mastran and Lowerre 1983: 158–159, 167–172).

Some of these conflicts have been exacerbated by differences between the viewpoints of mountaineers and those of environmental groups, which gained in strength after the 1960's. Related problems have arisen between long-time mountain dwellers and new, temporary residents who vacation in the Southern Appalachians. National forest and park expansions resulted in anxiety over loss of property and homes. New areas, particularly the Redbird Purchase Unit in Kentucky, reintroduced the USDA Forest Service to land acquisition and rehabilitation problems that had been common during the early 20th century.

New laws resulted in new management goals and strategies for government agencies. In addition, the National Environmental Policy Act of 1969 required environmental impact studies of resource management on Federal lands. The Endangered Species Act of 1973 gave new importance to wildlife issues and complicated timber harvesting, recreational development, and economic development projects. In the 1980's, concern over air pollution expanded as researchers considered its role in acid rain and tree mortality. These new problems illustrated a new understanding of the scope of human influence on the environment.

Recent history has provided new solutions and new challenges to the ancient Southern Appalachian landscape. Reforestation and restocking efforts begun in the early 1900's have been successful in reestablishing forest cover and many species, particularly the white-tailed deer. The lumber supply of the region has increased substantially; however, resource use, while varying along with the national economy, has steadily risen. Forest management for lumber does not provide habitat for all native species, and conflict remains on how to provide space for both human and nonhuman needs. Wilderness designations have reduced human impact on some tracts of forest, but roads have opened most corners of the mountains to industry and tourism. Demand for timber and minerals continues to make conservation efforts problematic, whereas pollution from within and without the region threatens the forests and streams. The sheer numbers of people using the Southern Appalachians for homes, livelihood, or recreation make the issue of human impact on the environment more important today than ever before.

Conclusion

As it has for 10,000 years, human interaction with land, water, and wildlife remains at the core of environmental change but on a much larger scale. The role of humans in landscape change has steadily increased in intensity over the centuries until it seems to pervade every aspect of the environment. Paleo-Indian impact on the land was limited to establishing camps, hunting game, gathering plants, and using fire. Human activity encouraged plants and animals favored by fire and clearings and spread the seeds of gathered plants. Although the impact was significant, it left most areas relatively undisturbed. Human influence on the environment, however, increased along with human population, augmented at times by new technologies in hunting, fishing, and managing plant populations. With the development of horticulture between 2,500 and 1,000 B.C., the number of humans and their impact on the landscape increased significantly. Nevertheless, widespread clearing remained restricted to the valleys around villages and settlements.

The arrival of Europeans and Africans in the 1500's introduced new species of plants and animals, new technologies, and new diseases. New diseases caused the first significant change, decimating the American Indian population and causing the paramount chiefdoms of the Southeast to collapse. Warfare and slave raids exacerbated the social disruption, whereas trade with the newcomers led to overhunting of deer, elk, and fur-yielding animals. Initial European settlement focused on depopulated areas but soon pressured American Indian hunting territories. By the late 1700's, pressure increased on Cherokee settlements, culminating with their removal in the 1830's.

During the 1800's, many species of plants and animals became extinct or severely restricted in the Southern Appalachians. Mining and lumbering, begun as localized endeavors, grew into large-scale enterprises with widespread effects. The small-scale islands of human disturbance of prehistory and early European settlement expanded to include all but the most remote areas. Starting in the late 19th century, improvements in transportation and mechanization accelerated deforestation, resource extraction, and pollution. By the time national forests were established in the Southern Appalachians in the early 20th century, 70 percent of the region's forests were cutover. Fire and floods were common and the composition of forest plant and animal populations was drastically altered.

Although the conservation and environmental movements have ameliorated some problems in the Southern Appalachians, many problems remain. New technology promises solutions for old problems but creates potential new hazards for the environment. Ecological research has expanded knowledge of environmental processes, the needs of various species, and the effects of many human activities. However, long-term human influence on the environment has complicated attempts to understand mountain ecosystems. National forests and parks have successfully protected old forests and fostered new forests in the region. Federal and State laws have restricted the impacts of industry on the environment, but the enormous increase in human population over the last century makes pressure on the land and resources of the Southern Appalachians inevitable. In addition, different groups of people make different demands on the resources of the mountains (fig. 24). Many of these demands are incompatible, and there is not enough space in the Southern Appalachians to give each group its own territory. How the Southern Appalachians are divided between industry, agriculture, tourism, and wilderness will continue to alter the face of these ancient mountains.

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Figure 24—Jefferson National Forest "show me" trip designed to explain USDA Forest Service projects and activities to the public.

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Appendix

Plant Names

Trees
Ash (*Fraxinus*)
Beech (*Fagus grandifolia*)
Butternut (*Juglans cinerea*)
Cherry (*Prunus*)
Chestnut (*Castanea dentata*)
Fir (*Abies*)
Hackberry (*Celtis*)
Hickory (*Carya*)
Oak (*Quercus*)
Peach (*Prunus persica*)
Persimmon (*Diospyros virginiana*)
Pine (*Pinus*)
Red cedar (*Juniperus virginiana*)
Spruce (*Picea*)
Sumac (*Rhus*)
Sycamore (*Platanus occidentalis*)
Tuliptree (*Liriodendron tulipifera*)
Walnut (*Juglans nigra*)

Herbaceous Plants
Amaranth (*Amaranthus*)
Beans (*Phaseolus*)
Bluegrass (*Poa pratensis*)
Bunchgrass (*Galium*)
Canary grass (*Phalaris canariensis*)
Cane (*Arundinaria tecta*)
Clover (*Trifolium*)
Copperleaf (*Acalypha*)
Corn/Maize (*Zea mays*)
Cotton (*Gossypium herbaceum*)
Cowpeas/Black-eyed peas (*Vigna sinensis*)
Cushaw (*Cucurbita moschata*)
Flax (*Linum usitatissimum*)
Ginseng (*Panax quinquefolia*)
Goosefoot (*Chenopodium berlandieri*)
Gourds (*Cucurbita*)
Grape (*Vitis vinifera*)
Knotweed (*Polygonum erectum*)
Little barley (*Hordeum pusillum*)
Marshelder/Sumpweed (*Iva annua*)
Maygrass (*Phalarsis caroliniana*)
Pigweed (*Amaranthus retroflexus*)
Pokeweed (*Phytolacca decandra*)
Potato (*Solanum tuberosum*)
Pumpkin (*Curcurbita pepo*)
Purslane (*Portulacca oleracea*)
Squash (*Curcurbita maxima*)
Sunflower (*Helianthus annuus*)
Sweet potato (*Ipomoea batatas*)
Tobacco (*Nicotiana tabacum*)
Watermelon (*Citrullus vulgaris*)

Animal Names

Bear (*Ursus americanus*)
Beaver (*Castor canadensis*)
Bison (*Bison americanus*)
Brown trout (*Salmo fario*)
Cougar/Mountain Lion/Panther (*Puma concolor cougar*)
Elk (*Cervus canadensis*)
European wild boar (*Sus scrofa*)
Mammoth (*Elephas primigenius*)
Mastodon (*Mammut*)
Mink (*Mustela vison*)
Otter (*Lutra canadensis lataxina*)
Rainbow trout (*Salmo irideus*)
Sea turtle (family Cheloniidae)
Turkey (*Meleagris gallopavo*)
Turtle (order Testudines)
White-tailed deer (*Odocoileus virginianus*)

Yarnell, Susan L. 1998. The Southern Appalachians: a history of the landscape. Gen. Tech. Rep. SRS-18. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 45 p.

Natural and geological processes have changed the Southern Appalachian landscape repeatedly over millions of years. About 12,000 years ago, humans arrived and became important agents of change. The extent and degree of human influence increased along with the population. Today, pressure remains intense on the Southern Appalachian landscape and management issues bring contention as different groups seek to use the region's resources in different ways.

Keywords: Agriculture, environmental history, lumber industry, mining, prehistory, Southern Appalachian, tourism.

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