

Wildlife and other Aspects of the Mountain Longleaf Pine Forests and other Ecosystems of Northeast Alabama and Northwest Georgia

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Johnny Stowe: SC Department of Natural Resources: Wildlife Diversity Section
P.O. Box 167 Columbia, SC 29202 USA: 803-734-4037: jstowe@scdnr.state.sc.us

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Introduction

As a small boy, I grew up hunting fox squirrels (*Sciurus niger*) with dogs in longleaf pine (*Pinus palustris*) forests in Polk County, Georgia, and later, when I got old enough to ramble the ridges hunting deer (*Odocoileus virginianus*), most of my favorite places to hunt were on the rocky and rugged ridges where longleaf still grew. Until I went to forestry school at the University of Georgia, I thought that longleaf *only* grew in these rough mountain lands here in northeast Alabama and northwest Georgia. Imagine my surprise when I learned in dendrology class that mountain longleaf was something of an anomaly, and that most longleaf grows in the sandhills or coastal plain. But I reckon that revelation only intensified my love for mountain longleaf, an affinity that most likely initially developed as a result of the tree growing in the roughest, most isolated areas of the Ridge and Valley (R&V) and Blue Ridge (BR) physiographic provinces where I was raised. I've always liked to hunt in places where most other hunters didn't go. Another thing that likely enamored longleaf to me was its scarcity and beauty -- its big cones and long needles especially -- plus the uncommon critters and plants and caves and rock outcrops that tended to be found where longleaf grew. Fox squirrels and prickly pears (*Opuntia humifosa*) were mighty exotic things to me back then.

Longleaf wasn't always confined to the steepest, most rugged, inaccessible and xeric parts of this region though; it once grew on a variety of rocky soils on a large portion of the landscape, including hollers [sic] and gently rolling hills with more mesic soils, on extensive gravelly-clay flatwoods, and even on the north slopes of some ridges. At the turn of the nineteenth century, Reed (1905) reported that about 87% of the landscape in Coosa County, Alabama was dominated by longleaf. Even in the remaining 13%, which Reed called "creeklands," longleaf was a co-dominant species (Varner, Kush, and Meldahl 2000, 2003a).

To look at where we are and hope to be going, it'll be helpful to look back at where we've been. So let's go back, way back, and consider the geology, topography, hydrology, and the parent materials of our soils, then look at the plants and animals and

ecosystems of the distant past -- some of which are still with us -- and finally at the people who've lived here and managed this land over the millennia, and then at where we are today and the opportunities for the future.

It's a rare honor and privilege for me to come speak to y'all today about mountain longleaf, a subject most dear to my heart. Although I've lived in South Carolina for almost 8 years now, I'm going to speak in the inclusive voice of a native, for that I proudly am. I was raised here; these hills and hollers are my home, the center of and the most important part of the Earth to me, so when I speak -- and I am going to speak more colloquially than formally -- when I speak of what "We" have here -- you'll know where I'm coming from. Let's look back.

Physiography and History

The rocks and soils of the R&V, BR and Cumberland Plateau are among the oldest on Earth; they began forming about 600,000,000 years before present (BP) during the Paleozoic Era's Cambrian, Ordovician, Mississippian and Pennsylvanian periods. Seas covered much of this area periodically during the geologic past.

This land near the Georgia-Alabama state line along the 34th parallel of latitude is unique in its convergence of landscapes and ecosystems, and dialects and cultures. The R&V, BR, Cumberland Plateau, and Piedmont all join in this area, and the Coosa River -- which drains the area, is unusual for draining all these physiographic regions -- as well as, in its lower reaches -- the coastal plain. If you look at the range maps for many species, you'll see that they overlap here, and/or that this area represents a range extension (mostly running up the Coosa River Valley or down from the Appalachians) or that the populations are disjunct from the rest of the species' range. This area has a spectacular array of biodiversity, from alpha to beta to gamma diversity -- the whole range from the genetic to the population to the landscape level -- found nowhere else in the world. And the culture of the Deep South meets that of the Southern Appalachians here also, resulting in a unique dialect, accent, and blend of Southern traditions.

Many of the soils of the valleys of the R&V tend to be calcareous, which has led to a proliferation of eastern redcedar (*Juniperus virginiana*), which in turn led to the part of the valley in Georgia just north of the Cartersville Fault being named the Cedar Valley.

Most of the soils around these parts tend to be rather heavy compared to soils in other parts of longleaf's range -- they consist of cherty, shaley, or gravelly loams ranging from the sand to the clay extremes of the soil triangle. Most of these soils have relatively high bulk density compared to longleaf sites of the coastal plain and sandhills.

The R&V runs 900 miles from New York to Alabama, and has been shaped by thrust and fold faults so that the landscape, when viewed from above, resembles a kicked-back floor rug. This belt of parallel ridges and valleys was formed by the continental collisions that built the Appalachians and formed the Pangaea supercontinent 300-400 million years ago (<http://tapestry.usgs.gov/features/06valleyridge.html>).

Physical and chemical erosion has shaped our hollers [sic] and formed rock shelters, and caves and sinks have weathered from limestone to form one of the major karstlands of the eastern U.S. (Back et al. 1988). The ridges tend to be oriented northwest to southeast or north to south and capped with quartzite (Varner et al. 2003b), sandstone and chert. The rocks of the valleys tend to be shale, limestone (Mount 1975), and dolostone. Minerals such as limestone, flagstone, shale, slate, brick and tile clay, Portland cement, ocher, iron-ore, manganese, coal, barite, bauxite, bentonite, tripoli, and chert are in varying degrees abundant (Furcron 1964, <http://soilphysics.okstate.edu/S257/book/mlra28/index.html>), and have played a major role in how the area has changed since Europeans arrived.

Some of the South's largest springs and best drinking water are found in the R&V. My hometown of Cedartown, Georgia in Polk County was named after the abundant eastern redcedar and longleaf pine that once dominated the area, and was founded around the Big Spring, the second largest limestone spring in the South, which produces an average of 4,000,000 gallons of water per day. Just north of the Polk/Floyd County line in the town of Cave Spring a phenomenal spring gushes 2,000,000 gallons of pure water per day from a large limestone cave.

The Cartersville Fault (a.k.a., Talladega Uplands [Wharton1998], Weisner Ridges [Yarrow and Yarrow 1999]) averages 1,100-1,300 feet > mean sea level (MSL), and is classified by many authorities as a narrow, linear extension of the BR separating the R&V from the Piedmont (e.g. Brown and Kirkman 1990) and terminating near the boundary of Alabama's Calhoun and Talladega counties. Other, more general references show the R&V and Piedmont joining at the Fault (e.g. Mount 1986). The Fault roughly delineates the Polk/Haralson and Polk/Paulding county boundaries and is known locally in Georgia (from west to east) as Treat, Casey, Dugdown, Cobb, Hightower, Everett, Paris, Vinson, Brushy, and Braswell "mountains." In Georgia, the springs bubbling up from the Fault that run northward feed Big Cedar and Euharlee creeks; the springs that emanate from the western end of the fault also feed Big Cedar, as well as Terrapin Creek, and the Tallapoosa River, all of which eventually run into the Coosa. The Coosa is formed in Rome at the confluence of the Oostanaula and Etowah rivers and the Coosa joins with the Little and Chattooga rivers near Lake Weiss dam. The rich and once heavily-timbered bottoms of the Coosa likely harbored the extinct Carolina parakeet (*Conuropsis carolinensis*) and the now probably-extinct ivorybill woodpecker (*Campephilus principalis*) just a little over a century ago.

The elevation of the Valley ranges from about 900 feet MSL at the foot of the Fault to 564 feet MSL at Lake Weiss dam on the Coosa River, and of course the elevation drops steadily as the Coosa runs to the Fall Line. The elevation of some of my favorite Alabama ridges in or on the edge of the Valley range from 1,940 feet MSL on Oakie Mountain to 1,968 feet MSL on Flagpole Mountain to 2,140 feet MSL on Dugger Mountain. Dugger is the second highest point in the state; it's not much lower than Cheaha, which at 2,407 feet MSL is Alabama's highest point.

Fossilized crinoid stems, bivalves and other marine critters attest to the longterm inundation of this area. The rocky flatwoods northwest of Cave Spring, Georgia and

south of the Coosa River and Lake Weiss near the Alabama/Georgia line are an especially-fruitful place to find fossils as well as Indian artifacts. These flatwoods were once annually burned and dominated by longleaf (Wharton 1998), but are now covered with loblolly pine (*P. taeda*) plantations. Lake Weiss inundated many longleaf forests (Wharton 1998).

The First Americans arrived here as the last glaciation ended, when the climate warmed and boreal tree species (e.g. jack pine (*P. banksiana*)) were being displaced by Southern taxa (Buckner 1989). Here along the 34th parallel of latitude is about as far south as the boreal tree species migrated (Carroll et al. 2002), and at that time longleaf and many other species were pushed into refugia farther south. The retreat of the glaciers obviously affected this landscape, but so did the Indians. In the 12,000 or more years the Indians were the dominant (and only) people in the Southeastern United States (SE), they changed the landscape dramatically.

When the Indians first arrived here they found, as they did all over the continent, the Pleistocene megafauna still intact, but maladapted to withstand predation by bipedal, tool-wielding, cooperative hunters. Martin's (1967) highly-contentious "Pleistocene Overkill" hypothesis, which holds that these first southeasterners and their Clovis and Folsom-culture cohorts across the Americas hunted the megafauna to extinction, seems at least partially true, although oversimplified. Some contend that climate change was the paramount cause of the demise of the giant sloths, giant armadillos, glyptodonts, horses, tapirs, capybaras, llamas, mastodons, mammoths, and other animals that once roamed this land, but that seems to beg the question of why the other glacial periods preceding the last one failed to eradicate these animals. To me, the most cogent argument is that a combination of climate change and/or overkill was responsible, depending on the species.

"Place names" – those often-colorful terms which are used to identify topographical and geographical features such as springs, streams, mountains, towns, trails, and roads -- are often long-established and based on native plants or animals, and/or indigenous words. Many times these place names are all that is left, the animals that they describe them having long been extirpated (Cox, Maehr and Larkin 2001, Stowe 2003). Indian names persist all over this area -- names like Hickory, Appalachia, Cheaha, Kennesaw, Chickasawhatchee, Hiawasee, Pinhoti, Sylacauga, Choccolocco, Tallasseehatchee, Talladega, Tallapoosa, Coosa, Oostanaula, Etowah, Chattooga, Chattanooga, Conasauga, Coosawatee, Alabama, and others -- they add character and charm to the landscape and remind us of the past.

The Native Americans were a culturally diverse people (Krech 1999) -- but I'll be forced to make some generalizations in the interest of time. When the Indians arrived these soils were similar to what they are today, except that King Cotton sent much of the topsoil of the arable land down to the Gulf of Mexico via the Coosa River as a result of creekbank-to-creekbank plowing. And we continue to send our topsoil to the sea. Today sediment-laden rivers like the Tallapoosa --which emanate above the sandhills and coastal plain

-- are called “redwater” rivers, but they were not always muddy. Bartram (1928) -- who traveled through the SE in the late 1700s -- wrote that the waters of the lower Tallapoosa [sic] River were very clear, agreeable to the taste, and esteemed salubrious.”

The PaleoIndians (12,000 BP–10,000 BP) in the SE developed from their initial nomadic hunter-gatherer lifestyles through the Archaic (10,000 BP–3,000 BP) and Woodland (3,000 BP–1,300 BP) cultures, and finally into the sophisticated Mississippian culture (1,300 BP–300 BP)(Hudson 1976) that De Soto and his gold-greedy, swine (*Sus scrofa*) - herding army encountered in the 1540s. After the collapse of the Mississippian culture because of European influences such as disease and disruption of trade alliances, the tribes we know as the Creek and Cherokee developed in the early Historic Period (late-1600s to mid-1800s).

The boundaries of the nations of people we came to call Creeks and Cherokees met and shifted back and forth across what is now Polk County, Georgia and Cherokee and Cleburne counties in Alabama. Martin and Szuter (1999) describe western US lands lying between certain tribal boundaries and within these boundaries as “war zones and game sinks,” respectively. Game was especially abundant in war zones (game sources) as a result of only nomadic or even less lengthy inhabitation (hunting or raiding forays) by tribes on either side because of the hazards of intertribal war. A more peaceful arrangement might have produced similar distributions of game species; e.g., some tribes in the Ohio River Valley agreed to not live in, but rather only to hunt in areas between tribal territories (Phil Wilkinson, SCDNR, personal communication). A situation similar to both of these may have once been the case here along the Creek/Cherokee boundary. Tradition holds that these tribes once played a ball game to settle an ownership dispute over the Big Spring and the Cedar Valley and surrounding lands. The Cherokee won and they occupied this land when European settlers arrived. No doubt other disputes were less sporting.

Societies such as the Mississippian Etowah and Coosa chiefdoms both represent the pinnacle of cultural achievement and also harbored some of the highest pre-Columbian population densities in North America. As these Indian cultures evolved, they moved more toward specialization of labor and large population centers, and they more tightly embraced active, purposeful land management such as larger scale agriculture and the use of fire. Morgan Varner speculates that the densely-populated chiefdoms of the R&V and the frequent Indian-set fires may be the reason that longleaf radiated so far up the R&V, as opposed to other inland areas (Stowe et al. 2002).

All humans are a keystone species, and we have been since we’ve been human. Wherever we go -- for better or worse -- we affect the landscape and the survival and abundance of other species. Native Americans, who may have numbered 100 million or more in pre-Columbian times, were the ultimate keystone species (Kay 1998). The primary land management tools of the SE Indians were the bow and arrow, the spear, and fire. Aboriginal people’s use of fire as a management and/or hunting tool in various places around the globe is well-documented (e.g. Bulpin 1987, Komarek 1981, Turnbull 1987, Bell 1989, Johnson and Hale 2000) and the Indian’s use of frequent fire is no

exception (e.g. Bartram 1928, Savage 1970, Komareck 1981, Delcourt and Delcourt 1997, Johnson and Hale 2000, Van Lear and Harlow 2000). Paleoecological research in this region reveals land use patterns, with charcoal deposits indicating that regional fires continually increased from the late Archaic period through the Woodland and Mississippian periods up to the Historic period (Delcourt and Delcourt 1998). The palynological record shows that both pine and corn pollen increased significantly about 2,500 years BP in central Alabama (Ron Smith, US Army Fort McClellan, personal communication), with increasing fire and land clearing for slash-and-burn agriculture leading to proliferation of Southern pines.

Lewis (1973), being something of a “splitter,” attested that the Indians used fire for at least 70 different reasons, but being more a “lumper” myself, I prefer the 11 general categories Williams (2000) lists, which are: hunting, crop management, insect collection, pest management, range management, fireproofing, warfare and signaling, economic extortion, clearing areas for travel, tree felling, and clearing riparian areas. Hudson (1976) suggests that burning the woods may have facilitated collection of chestnuts and acorns.

Speaking of “acorns,” I’ve got to make a few comments on our dialect and accent. Dr. Sydney Johnson -- Professor Emeritus at the University of Georgia and Southern Scholar -- once chastised some of my schoolbuddies from up north for pronouncing the word “A-korn,” instead of “A-kern,” as is proper. His rationale was that the last syllable’s root was derived from the word “kernel,” and that’s good enough for me, since when I hear someone say “A-korn,” I think at once of thick calluses from ill-fitting shoes. I admit though, that my American Heritage College Dictionary (Costello 1993) allows both pronunciations.

Our dialect and accent are heavily influenced on-the-one-hand by the Scots-Irish hillbilly culture of the Southern Appalachians (for a wonderful account of this culture, see Kephart 1992), with its Middle English words, and on-the-other-hand by the Deep South culture, with its African influence. From the Scots-Irish we get words like “holp” used for “help,” plus the word “yonder,” which many people think sounds like hick-talk, but it’s just antediluvian English from Shakespeare’s day. Think of Romeo and Juliet, ... “Hark what light through *yonder* window breaks” The mountain influence also imparts strong use of the “r” sound, which is unlike Deep Southese, in which “r”s are generally dropped off the ends of words, as in “Ah’m goin to de rivuh dee-uh huntin to-moh uh.” Mark Twain wrote that an educated Southerner never used an “r” except at the beginning of a word. The African influence in the Deep South is evident in words like “tote” for “carry,” and “cooter” for turtle.

I’ll make one more comment about dialect before I move on. I like people and cultures of all kinds and think our differences make life interesting. But it really makes me sad to see and hear the homogenization of American cultures, especially changes in Southern culture, which is mostly, I reckon, through the influence of television. The most deplorable instance to me of this phenomenon is the common use by born-n-bred Southerners with accents as thick as mine -- or thicker -- of the term “you guys,” instead

of the proper Southern “Y’all.” This is even more egregious to me when used to refer to a group of men *and* women. Some of my older friends do this unconsciously, but young folks seem to purposefully try to avoid sounding Southern, which is a real shame.

Given the extremely high incidence of lightning strikes in the SE, more fires may have been ignited by lightning than by the Indians, but in the steep lands of the BR and R&V, probably more acreage was burned by Indian-set fires (at least in the past few thousand years) because: (1) weather that fosters thunderstorms does not usually coincide with high fire hazard conditions, (2) lightning strike fires are often extinguished by rain, (3) most lightning fires were ignited on ridgecrests and did not spread into or across the lower coves and hollers (Barden 1997), and because (4) the Indians were burning for specific purposes.

Osage orange (*Maclura pomifera*) was once restricted to southern Arkansas and Oklahoma and northeastern Texas (Harlow et al. 1991). The Indians used this tough wood for bows, and its common occurrence along many creek bottoms in the Cedar Valley seems to likely be a result of plantings by the Indians.

Cane (*Arundanaria gigantea*) once dominated extensive riparian areas in the SE. Many early authors document this phenomenon. I counted at least 24 instances in which Bartram (1928) mentioned cane in his classic *Travels of William Bartram*, using phrases like -- “vast cane swamps,” “a large cane swamp and meadows,” “cane swamps, of immense extent,” “wide spreading cane swamps,” and “canes grow here thirty or forty feet high, and ... three or four inches in diameter.”

Canebrakes were prime hunting grounds. Frontier naturalist Gideon Lincecum described canebrakes as the ““great *sanctum sactorum*; the inner chamber of the hunting ground”” (Platt, Brantley and Rainwater 2002). Animals such as the canecutter, or buck rabbit (*Sylvilagus palustris*), canebrake rattlesnake (*Crotalus horridus*), and place-names like the ubiquitous “Cane Creeks” in this and other parts of the SE attest to the bottomland prominence of cane in the past. Black bear (*Ursus americanus*) were once common in this area, and were very fond of canebrakes for cover, and considering how much bear love greenbriar (*Smilax* spp.) leaves, vines and fruit as year-round forage (Landers et al. 1979) -- for feeding as well -- since canebrakes are often laced with greenbriar.

Bachman’s warbler, once found here, but now-likely extinct, may have been a cane-dependent species (Remsen 1986). Swainson’s warbler (*Lymothlipis swainsonii*) (Meanley 1971) and hooded warblers (*Wilsonia citrina*) nest in cane thickets. Wild turkeys in canebrakes are mentioned in many historic accounts, and Audubon’s famous wild turkey (*Meleagris gallopavo*) painting includes cane. Six species of butterflies -- five of them species of concern -- are canebrake specialists, viz., Creole pearly eye (*Enodia creola*), Southern pearly eye (*E. portlandia*), cobweb little skipper (*Amblyscrites aesculapius*), cane little skipper (*A. reversa*), and yellow little skipper (*A. carolina*) (Platt, Brantley, and Rainwater 2002). Deer (*Odocoileus virginiana*) sought cover in cane and fed on its tender new growth (on cane savannas), and in the 18th century, large herds of elk (*Cervus elaphus*) and buffalo (*Bison bison*) were documented on canelands as far east

as the Charlotte, NC area (Barden 1997). Most records of buffalo east of the Mississippi River were associated with canelands (Platt, Brantley, and Rainwater 2002).

Cane is disturbance dependent, but also disturbance sensitive. Overgrazing and too frequent or not-frequent-enough fires suppress cane. Seeding is poorly understood also, but seems to be neither regular nor frequent (Platt and Brantley 1997). Cane likely quickly invaded abandoned Indian fields.

The Indians burned canebrakes to drive game (Savage 1970) and to clear riparian areas for various reasons. When burned, the airtight internodes on canes explode loudly -- that's several explosions per stem, multiplied times tens-of-thousands of stems per acre. It must have been exciting to witness such a fire. In some of my family's old papers, a tale is told of a few settlers riding past a canebrake one day when the Indians were still in Cedar Valley, when they were subjected to an ostensible barrage of gunfire. Well, no one being injured, they put the spurs to their mounts and hightailed it back toward the settlements in the Atlanta area, sounding the alarm Paul Revere-style along the way. Imagine their embarrassment when the supposed "gunfire" turned out to only be the Indians burning a canebrake as they happened to pass by.

Cane ecosystems are classified as critically endangered; > 98% of the canebrakes are gone (Noss 1995) as a result of overgrazing by cattle, land clearing, alterations in the fire regime (Platt and Brantley 1997), and inundation and flood control. Scattered stems of cane are still extremely common across the SE, but the extensive thickets we once had are almost gone. Many former cane sites now are either in pasture or row crops, or have been invaded by the invasive exotic plants privet (*Ligustrum* spp.) or *Microstygium*. Not much good can be said of privet, but woodcock (*Scolopax minor*) do seem to be fond of it, and deer browse it and use it for cover. But I'd rather have the cane back. Managing for cane is not a popular or well-understood practice. Like longleaf pine, cane as a species is not imperiled, but the unique ecosystems centered on each of these species are nearly gone. At the 3rd Longleaf Alliance Conference in Alexandria, LA in 2000, Dr. Bill Boyer pointed out the need to research and manage for cane and other disappearing habitats embedded within the longleaf pine ecosystem.

As they developed agriculture, hunting and gathering became less crucial to the Indians, but they nonetheless remained an important part of their lives. Animals were honored in ritual and ceremony and continued to provide an important part of the diet up to the historic period. The archaeological record indicates birds -- including waterfowl, raptors, passenger pigeons (*Ectopistes migratorius*), and ivorybill woodpeckers, as well as upland gamebirds such as bobwhite quail (*Colinus virginianus*), and especially wild turkey, were an important part of Indian life (Goslin 1945). Rattlesnakes (*C. horridus* & *Sistrurus miliarius*) held an eminent position, as evidenced by the rattlesnake-festooned dancers depicted on ornamental gorgets. Deer were likely the most important single animal; their remains dominate many archaeological sites. Animals were killed not just for their meat and hides, but also for tools such as bone fishhooks, and for decorative and ritual purposes. At sites in Etowah in Georgia and Chucalissa in Tennessee, Eastern box turtle (*Terrapene carolina*) remains are more common in some excavations than any other

animal except deer (Larson 1980). Their shells were used as rattles, and their meat was also likely eaten. Tribes in the Northeastern U.S. overcollected box turtles and may have been responsible for extirpating them from certain areas (Stowe 1995).

Following the epidemic diseases introduced by Europeans and the resultant 90% decline in the Indian population, elk and buffalo became abundant in the SE. Desoto mentioned no buffalo from his travels through the SE in 1539-1542, but later writers reported buffalo along DeSoto's route. Buffalo were abundant in Georgia in 1733 and extirpated by 1770 (Geist 1996). The astounding flocks of passenger pigeons described by early explorers -- flocks 10 miles wide and 120 miles long that darkened the sky and took days to pass over -- may have been an "un-natural" population irruption -- an artifact of the "American Holocaust" (Kay 1998). These range extensions and population explosions likely resulted from relatively sudden landscape-level habitat changes, freeing up of mast crops, and a lapse in hunting pressure, all of which occurred after the Indian populations collapsed within 50 years of Old World contact (Geist 1996, Platt and Brantley 1997; Kay 1998; Platt, Brantley, and Rainwater 2002).

The ranges of the red wolf (*Canis niger*) and gray wolf (*C. lupus*) once overlapped here, and we had cougars (*Puma concolor*) as well. Today the coyote (*C. latrans*) seems to be filling the red wolf's niche.

The population crash precipitated by European diseases devastated Indian society, and when the Indians first obtained and became dependent on guns and other European trade goods, their millennia-old culture began to change even more. The brilliant human ecologist Paul Shepard (1997) noted how "profound psychological stress, due to catastrophic epidemic diseases, resulted in a relaxing of customary circumspection and a collapse of respect for the sacredness of animals" permitting the Indians to join whites in overkilling game. But this historic era of rampant overexploitation of game came only after the market in human lives collapsed.

When the Creeks found that their captives from intertribal warfare were in great demand by the English, they launched all-out war against neighboring tribes to capture slaves to trade for guns and powder and other commodities. After < 20 years of this slave-raiding, only the strongest tribes remained (Green 1990).

Then in 1717, the colonial government banned the Indian slave trade, and the Creeks, for whom the deerskin trade had been secondary to slave-trading, became entirely dependent on the deerskin trade. The trade in deerskins exploded. Good records of the trade are sketchy, but Green (1990) reports that during the period 1740-1760, Charles Town [sic] merchants shipped about 48,000 deerskins to England annually, and that Savannah traders annually shipped about 31,000 deerskins to England between 1755 and 1772. Creek hunters alone may have killed as many as 45,000–50,000 deer per year for sale (Green 1990). Wood (1992) maintains that by the 1730s Charleston was shipping 80,000 deerskins to England annually, and that figure doubled by 1748, in a slaughter comparable to that of the bison on the Great Plains later on.

As the deerskin trade grew, communal hunting declined, and the reasons for deer hunting changed. Deer were shot not only for food, but also for their hides, and the meat was often left to rot (Hudson 1976). The white-tailed deer -- the animal that had been most important to SE Indian culture and survival -- was tragically and ironically part of the culture's downfall once the Indians began viewing deer primarily as a means to acquire European goods.

Northwest Georgia was the last part of the state permanently invaded by Europeans, who began settling here in the late 1820s. The rich valley land was mostly grabbed up by people of English Cavalier stock, while the Scots-Irish settled what was left -- the rugged mountain land. These Scots-Irish hillbillies -- who would have been called "Crackers" if they had lived in north Florida or South Georgia -- brought with them ancient Celtic characteristics that would be indelibly stamped on the land -- a tradition of hunting, range-burning, and open-range livestock (Johnson and Hale 2000), great independence and disdain for authority -- especially the government -- and the knowledge of how to clandestinely make likker [sic] (Kephart 1992).

My great-Grandfather Sterling Young, who was born just north of the Cartersville Fault in 1855 and lived until 1949, was persuaded to let one of his daughters write down some of the memories of the mid-late 1800s, and they've been passed down to me. I'll read you a few lines:

"The valley was a kind of paradise for those who depended on hunting and there were some who knew the country round about like a fox or bird. They could spot game just walking along and did little besides hunt and fish. Before and after the [Civil] War we had the passenger pigeons, deer, and the wild hog. The woods were full of squirrels and possums. Partridges [bobwhite quail] were plentiful and there would be generally from thirty to forty in one covey. When flushed, they flew a hundred or a hundred and fifty yards and could then be walked up and bagged with a muzzle loaded gun. It took hardly anything to get a pan of fish. ... Len [Highfield] once caught a wolf -- a young cub."

In another passage, great-Grandpa Young continues along the same vein (please excuse the redundancy, but I didn't want to edit his words too much):

"What was Cedar Valley and environs like in these early times? This was some twenty-five years before I was born [in 1855] and so all I shall say on this subject is what I have been told. Everywhere were hills, valleys, and bubbling springs. The hills that cradled the valleys were covered with oak, hickory, pine, chestnut and cedar with an undergrowth of fern, holly, and wild flowers [sic]. Every few miles was a glen with a bubbling spring and a waterfall. The creek banks were live with tall grass on which the cattle of the newcomers took to field. Ranching and stock raising were the principal occupations of the first settlers; they knew how to grow cotton, but there were no roads by which a farmer could get cotton to a market."

"Those who depended on hunting and fishing for a livelihood found the woods full of squirrels, possums, and rabbits. Wild hogs were found when there were chestnuts and

acorns to feed on. Hickory nuts, haws and berries abounded. Walnuts were plentiful also. Sounds rosey [sic], but Paulding [County][part of Polk County was in Paulding County at that time] was no paradise in the 1830s. Indians made travel and living generally dangerous for some years.”

The Indian’s land was taken bit-by-bit once they became dependent on European goods and were overcome militarily. The 1814 defeat of the Creeks by the U.S. Army at the Battle of Horseshoe Bend on the Tallapoosa River broke the back of the Creek Nation (Green 1990). The 1830s saw the mass migrations of SE Indians from this area, culminating with the infamous Trail of Tears in 1838. And gone with the Indians went centuries of ethnobotanical lore and other wisdom, most of which has disappeared.

I was lucky to grow up knowing my Grandpa, Gordon Brewster, who was born in 1886 in Esom Hill, Georgia close to the Alabama line. He told me tales he had heard as a boy of folks hearing “painters” scream and of livestock and dogs being killed by “dog-eaters.” He told of killing a sackful of partridges often when he went bird hunting, and of his Daddy taking him turkey hunting near Borden Springs, Alabama and calling the birds with a folded leaf. He told me that quail, rabbits (*Sylvilagus* spp.), and foxes were extremely abundant, but that the deer and turkey were about gone, with only place-names such as “Turkey Heaven Mountain,” “Gobblers’ Knob,” and “Buck Snort Holler” remaining. Folks would travel for miles to see a deer track. The deer and turkey were simply overhunted, since there was plenty of good habitat for them. The small game populations were a function of both the patchwork of small farms, as well as the annual burning of the longleaf pine stands that punctuated the farmlands. At that time all the mountains in this area were full of homes and communities, most of which are identifiable now only by old chimneys, wells, remnant cultivar plants, and cemeteries (e.g. Antioch Graveyard on Overhead Bridge Road in between Terrapin Creek and Little Terrapin Creek in Cleburne County, Alabama).

“Development”: The Age of Railroads, Steamboats, King Cotton, Charcoal-Iron, and the (almost) University of the Southland

My Grandpa Brewster was born about the time the Birmingham-Atlanta railroad line was run. Prior to that the nearest major railroad to these parts was the Selma, Rome, and Dalton line, which was chartered in 1866 (Sargent 2000). The railroad greatly accelerated landscape change, as did steamboats; the latter became a lucrative business on the Coosa River as far up as Rome, Georgia.

Atlanta was at first a railroad town, and its most prominent name-icon, i.e. “Peachtree” -- as in the many Peachtree streets and roads-- may have indirectly been named after longleaf or perhaps a shortleaf (*P. echinata*) or loblolly (*P. taeda*) pine. A “persistent tradition” holds that the name was actually “Pitchtree” after a lightning struck or Indian-blazed pine the Indians used to get resin from on a high hill where “Peachtree” Creek runs into the Chattahoochee River. (Garrett 1969)

Steamboats and railroads enabled rural folks to get crops, forest-related commodities, and iron (from local mines and furnaces) to city markets, and also for them to get tools and provisions delivered relatively close to their homes. These improved logistics led to more land being cleared for agriculture, and to extensive mining and more timber being cut. Timber was high-graded for lumber, charcoal (longleaf was the top choice for iron furnace charcoal), and other fuel by animal-driven logging and steam-powered peckerwood sawmills, whose sawdust piles still dot these mountains.

The resulting logging-related slash -- combined with no cessation in woods burning, plus the coal-burning, spark-spewing, incendiary steam locomotives -- greatly altered the fire regime; extreme fire behavior became much more common, and this, coupled with the land clearing along with foraging of open-range hogs, severely impacted longleaf stands.

The iron-ore industry boomed along the state line in western Polk and eastern Cherokee counties in the latter half of the 1800s, because of an abundance of coal, iron-ore, limestone, and timber (charcoal) -- the main raw materials necessary for steel production. Places like "HIMMI-tite" [Hematite] (that's the way we pronounce it in Polk County), Oremont, Rock Run, and Bluffton were bustling economic communities based on charcoal-iron.

In pre- or early-automobile days, the railroads were the conduits folks used to go on vacation and for other travel, as well as to ship freight. Where we now drive or fly to the mountains or the beach for a week, folks in cities such as Birmingham, Chattanooga, or Atlanta rode the train to swanky resorts centered on large springs in the R&V. From 1904 until the Great Depression, "Hotel Springs" in Borden Springs boasted a 100-room luxury hotel with French chefs and a golf course (Sargent 1998) on a hill beside a large mineral spring beside Terrapin Creek near Rock House Mountain. The most prestigious inn was the Signal Hotel in Bluffton, Alabama, a charcoal-iron industry town in Cherokee County on the Selma-Rome railroad. Nothing remains of Bluffton but a few big houseplace oaks (*Quercus* spp.) and a kudzu (*Pueraria montana*) patch, but during the Civil War it was one of the South's top industrial centers, and by 1890 it was a thriving city of 8,000 residents with a furnace, arms factory, and one of the finest resort hotels in Alabama. Many famous people, including Rudyard Kipling, stayed at the hotel, which was the first structure in the county to have electric lights. The University of the Southland was slated for Bluffton. City officials raised \$500,000 for start-up costs for the \$2,000,000 project, and in 1889 dignitaries from across the nation attended the groundbreaking ceremony, but the collapse of the iron-ore industry doomed the project (McElwee 2000; Cherokee County, AL Chamber of Commerce, personal communication).

The area along the Georgia/Alabama state line has been an insular and lawless area and fertile soil for certain Scots-Irish traditions since European settlement (and remains so today, although to a lesser degree). In the pre-radio days of law enforcement when not only communication -- but also transportation and records were primitive, interstate extradition difficult, and federal intervention sporadic and often inefficient -- it was a simple matter to hop from state-to-state as needed when the authorities were in pursuit.

This made the likker-making enclave along the state line a place where public anti-fire campaigns such as the federal government's Dixie Crusaders (Jacobs 1978) and Smokey Bear were unlikely to be embraced. This has ironically and coincidentally helped longleaf persist here (Stowe et al. 2002). Putz (2003) points out the inverse correlations between redneck culture, and hyperabundant deer populations and also fire suppression. This area would make a perfect study site for Putz's hypothesis.

Many of the places that we -- as well as the folks one or two generations before us -- think of as "natural," are in fact artifacts of fire suppression. Many of our longleaf sites are forested now in blackjack (*Q. marylandica*), scarlet (*Q. coccinea*), chestnut (*Q. prinus*) or other oaks, and Virginia (*P. virginiana*), shortleaf, and loblolly pines. Fire suppression coupled with the relatively sudden demise of the American chestnut (*Castanea dentata*) as a result of introduced chestnut blight (*Cryphonectria parasitica*) -- enabled these species to invade many sites for which they are not best-adapted. American chestnut once comprised about one in four trees in certain non-calcareous parts of the Appalachians. It was once the dominant overstory tree in eastern deciduous forests (Vandermast et al. 2002) and of enormous value as a reliable wildlife food.. I know a few spots where remnant longleaf and chestnut grow side-by-side still, and Dr. Bill Boyer (USFS, personal communication) found a healthy five-inch dbh chestnut on Fort McClellan. Vandermast et al. (2002) discovered a fascinating fact about chestnut recently, i.e., the allelopathic properties of leachate from its leaves. This finding may have significant implications for restoration and management of Southern Appalachian forests. The American Chestnut Foundation is working on several methods to bring chestnut back. One day we may again have montane longleaf ridges interspersed with American chestnut coves and hollers. That would be a wildlife paradise, and an aesthetic marvel.

The Southern hard-pine dependent, red-cockaded woodpecker (*Picoides borealis*)(RCW) hangs on in these parts in the longleaf/shortleaf pine woodlands of the Talladega National Forest. The RCW was once found in Georgia above longleaf's known range in 2 counties along the Tennessee line, as well as in Floyd County, where longleaf still grows -- and in Jackson County, Alabama, the state's northeastern-most county, also along the Tennessee line.

Longleaf may have once grown close to the Alabama-Tennessee line, outside its known range. Dr. Bill Boyer (USFS, personal communication) once showed me a newspaper clipping showing a bald eagle (*Haliaeetus leucocephalus*) nest in what appeared to be a longleaf pine along Crow Creek in Jackson County.

A study by Hill (1998) in the Talladega Mountains compared breeding birds in four forest types: hardwood forest, mixed pine/hardwood forest, established longleaf, and recently cut sites planted in longleaf -- and found that the "greatest diversity and abundance along with many species of concern occurred in established and recently planted longleaf stands." Womack and Wilson (2002) found that bird species richness was positively correlated with pine age and fire frequency. Frequently-burned longleaf pine stands have the diverse herbaceous layer favored by many grassland and shrub/scrub species, and

they provide cover and the variety and abundance of insects essential to turkey poults and bobwhite quail chicks, both of which predominantly feed on insects the first few months post-hatching. Fire also reduces parasites that infest turkey and quail (Landers 1981). Varying the season, frequency and intensity of prescribed fire ensures an abundance of the soft mast relished by birds and many other species of wildlife.

In the SE, the fox squirrel is almost invariably linked to open pine (especially longleaf), pine hardwood, or maritime forests, and displays a range of stunning pelages from silver to black to rust, sometimes with white or black heads or faces or combinations thereof. Three subspecies of fox squirrels (*S. n. bachmani*, *S.n. niger*, *S.n. rufiventer*) converge in this general region (Weigle et al. 1989), and based on physical characteristics, they seem to intergrade. Of the many dozen I have seen in this area, mostly in Georgia, all were the reddish color phase, suggesting the *S. n. rufiventer* race, although they did not tend to exhibit *S.n. rufiventer*'s smaller body size, suggesting intergradation with *S.n. bachmani* and/or *S.n. niger*. Larger body size has been hypothesized to be an adaptation to facilitate cutting, carrying, and opening the large cones of longleaf pine. Perhaps intergradation favored reddish pelage of the Midwestern race -- which matches many of the reddish soils of this area -- while the body size of the more southeasterly races was selected for as a feeding advantage.

Brent Womack (Jacksonville State University, personal communication) has seen black phase fox squirrels on the Talladega National Forest. Weigle et al's (1989) range map shows the mostly-midwestern *S.n. rufiventer* race coming no farther south than Tennessee, but I suggest that their range delineations may be a bit off.

There seems to be a fire-related, mutualistic symbiosis between fox squirrels, longleaf, and mycorrhizal fungi. Fox squirrels gain nutrients by eating these fungi, and they scatter the spores via defecation. These spores may be crucial to longleaf survival and growth by re-inoculating the bare mineral soil resulting from fire. Certain of these fungi fix nitrogen, increase root surface area and nutrient absorption, and produce plant hormones, auxins and cytokinins. Other animals may eat these fungi, but few travel as far over open ground as the fox squirrel does (Weigle et al. 1989).

Gray squirrels (*S. carolinensis*) are rapidly displacing fox squirrels in many longleaf forests as a result of fire suppression. As the canopy closes, grays gain the competitive advantage, especially when the canopy closes enough for grays to travel from one tree top to another. Squirrel hunting with dogs is becoming popular again in these parts, and it is quite enjoyable and a great way to introduce and "put a fire in kid's bellies" for hunting, because it doesn't involve being still and quiet, and the odds of killing a squirrel are high. We used mongrel, fiest-type dogs when I was a boy, but today it's mostly done with registered, often high-dollar fiests and curs (registered fiests and curs always sounds oxymoronic to me).

Sadly, squirrel hunting regulations in most SE states do not distinguish between fox and grays when it comes to season length or bag limits, even though the literature indicates that because of the dramatic differences in reproduction and survival (foxes have higher

survivorship than grays; foxes are more “k-selected” and grays more “r-selected”) -- that fox squirrel harvests should be much more restricted (Tapp and Guynn 1998, Conner 2001, Wood 1985). I think this line of thinking is even more on the mark when fox squirrels are in marginal habitat, or when dogs are used. I support hunting certain fox squirrel populations; a fox squirrel can make a wonderful trophy for a child, as well as a good meal, but we need to use much greater care in harvesting them than we do gray squirrels.

Healthy longleaf forests provide both some of the characteristics of both old growth forests as well as early successional ecosystems -- old growth traits such as a variety of age classes and diameters, snags as well as fallen trees and lighter stumps, abundant fungal component, and early successional traits such as an incredibly diverse understory of grasses and forbs, with little or no understory.

Dead mature longleaf provides key refugia for numerous critters because of its tendency to remain standing as snags for a long time compared to other species, and because of its characteristic and very durable “lighter” stumps with their complex subterranean crevices. About 60 species of birds and mammals in the SE -- not to mention herpetofauna -- depend on dead or dying trees of many species for roosting, resting, nesting or protection (Melchior 1991), and the durability of dead longleaf is even more important as we lose older age-classes of hardwood forests and the natural cavities they provide.

The Longleaf Alliance’s John McGuire has railed against synonymous use of the terms longleaf and wiregrass, and I hope he wins this battle. He says this of the montane longleaf pine woods, “nary a sprig of wiregrass is found. This is bluestem country” (Stowe et al. 2003).

I am really glad to see our natural resource agencies recognizing (Miller 2003) and slowly moving away from the often-harmful practice of planting invasive exotic plant species for wildlife, and toward restoring ecosystem integrity by restoring “Made in America” native species and ecosystems such as native shrubs (Moorman et al. 2002) and warm season grasslands. Some of these private and public land initiatives are aimed at grasslands and associated species like the suite of declining grassland birds (including bobwhite quail), and these goals go hand-in-hand with longleaf restoration and promotion of prescribed fire. Varner et al. (2003b) noted that fire seems to be an effective management tool to prevent invasions of exotic plant species. Just like we now see government agencies paying folks to restore wetlands that were once destroyed in the name of so-called “progress” by the same or similar agencies, one day we’ll see a major government campaign to eradicate the invasive exotic plant species that the government incentivized folks to plant for wildlife or other reasons.

Beaver (*Castor canadensis*) were pretty much extirpated from this area, as they were all over the SE, but they have rebounded since the collapse of fur prices, and the wood duck (*Aix sponsa*) has bounced back with them. Both species are secure around here now. The

woodies tend to roost mostly on our numerous beaver ponds and to feed on watercourses such as Terrapin and Cedar creeks and the Tallapoosa River.

The buck rabbit is also associated with beaver ponds. For a young hunter, a buck rabbit is a fine trophy. I remember killing them when I was so little that their ears dug the ground when I slung them over my shoulder. The rare Appalachian cottontail (*S. obscurus*) is found along our highest ridges. This species was once classified as the New England cottontail (*S. transitionalis*), but was recently split into a separate species (Chapman et al. 1992). The Appalachian cottontail is thought to be the only cottontail known to feed extensively on conifer needles (Linzey 1995). The symbiotic nexus between this rabbit and longleaf may be mutualistic or commensalistic, rather than parasitic, and warrants further study. The buck rabbit and Appalachian cottontail are sympatric nowhere else but in this area. They can be found < 1 mile apart where beaver swamps lie at the base of ridges. We of course also have the eastern cottontail rabbit (*S. floridanus*), and rabbit hunting with beagles was once very popular in these parts before deer populations became hyperabundant and made it so difficult to train dogs.

The limestone caves the R&V is well-known for are used for roosting by several species of bats, including eastern pipestrelles (*Pipistrellus subflavus*), big browns (*Eptesicus fuscus*), and the northern long-eared bat (*Myotis septentrionalis*), as well as the rare gray myotis (*M. grisescens*), Indiana myotis (*M. sodalis*), and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*). The winter ranges of the northern long-eared bat and gray and Indiana myotis all make dramatic funnels into this area (Harvey et al. 1999). The caves, rock shelters, and sinkholes of the R&V need to be located and inventoried, and where practical, protected.

Reptile and amphibian distributions are particularly interesting here -- intriguing range overlaps or extensions, endemism, and disjunct populations seem to result from topography, geology, hydrology, fire regimes, and the unique intersection of physiographic provinces and ecosystems.

The Alabama map turtle (*Graptemys pulchra*) reaches its northern limit here; the common map turtle (*G. geographica*) its southern limit; the range of the chicken turtle (*Deirochelys reticularia reticularia*) juts out up the Coosa River Basin; and races of the painted turtle (*Chrysemys picta*), river cooter (*Pseudemys concinna*), and sliders (*Trachemys scripta*) overlap and/or intergrade here.

We have a couple of unusual woodland salamanders. The pigeon mountain salamander (*Plethodon petraeus*) is tightly endemic to Georgia's Pigeon Mountain, which is near the boundary of the R&V and BR. This locally abundant salamander is found only on this one mountain, and nowhere else. The largest of the disjunct ranges of Webster's salamander (*P. websteri*) -- which I happen to manage on South Carolina's Steven's Creek Heritage Preserve -- centers here.

We have a disjunct population of the Southern hognose snake (*Heterodon simus*), and the northern pine snake's (*Pituophis melanoleucus*) oddly-shaped range covers this area, too.

Four species of venomous snakes crawl our woods: the copperhead (*Agkistrodon contortrix*), canebrake rattler, and Carolina pygmy rattler, and Mount (1975) reports a valid record of the cottonmouth (*A. piscivorous*) from this area. Mount (1975) also notes that the R&V is unique among Alabama's upland regions for having at least 5 species of Coastal Plain herpetofauna species not known to occur elsewhere above the Fall Line, viz., the chicken turtle, southern hognose snake, eastern glass lizard (*Ophisaurus ventralis*), oak toad (*Bufo quercicus*), and pine woods treefrog (*Hyla femoralis*). I am happy to learn that herpetofaunal data specifically for the mountain longleaf pine forest is being collected (George Cline, Jacksonville State University, personal communication).

The SE, especially Alabama, is a hotspot of aquatic biodiversity. Alabama has the greatest aquatic biodiversity of any state, and ranks first in freshwater turtles, bivalves, snails, crawdads, dragonflies and damselflies, and second only to Tennessee in freshwater fishes (TNC 1997). This area's imperiled and/or endemic fishes include the blue shiner (*Notropis caeruleus*), tricolor shiner (*Cyprinella trichroistia*), Tallapoosa shiner (*C. gibbsi*), pretty shiner (*Lythrurus bellus*), Southern cavefish (*Typhlichthys subterraneus*), trispot darter (*Etheostoma trisella*), coldwater darter (*E. ditrema*), lipstick darter (*E. chuckwachatte*), Tallapoosa darter (*E. tallapoosae*), Coosa darter (*E. coosae*), crystal darter (*Ammocrypta asprella*), black madtom (*Noturus funebris*), pygmy sculpin (*Cottus pygmaeus*), and river redhorse (*Moxostoma carinatum*). Some of these fishes are tightly endemic to the Upper Coosa or Upper Tallapoosa; some are rare; and some are locally abundant but in jeopardy because of very limited distribution. Threats include loss of spring, shoal, ripple and other sensitive habitats from sedimentation, pollution, and dams, impoundments and other alterations of streamflow. The pygmy sculpin is found only in Coldwater Spring, which supplies water to the City of Anniston (Page and Burr 1991, Mount 1986, GA DNR 1999). Our rivers produce some fine gamefishing too, including huge flathead (*Pylodictis olivaris*), channel (*Ictalurus punctatus*), and blue (*Ictalurus furcatus*) catfish. Lake Weiss claims to be the world's crappie (*Pomoxis* spp.) capital.

The pink lady slipper orchid (*Cyperidium acuale*) reaches its southern limit in this area. Large-flowered skullcap (*Scutellaria montana*), white fringeless orchid (*Platanthera integrilabia*), and several species of trilliums (*Trillium* spp.) are among our rarest and prettiest plants. At one time, pitcher plants (*Sarracenia oreophila*) grew in boggy wetlands around here (Wharton 1998), but only a few populations remain, most likely as a result of land clearing, interruptions in streamflow by dams and ditches, and fire-suppression. For a well-done description of select sensitive plants of the Talladega National Forest, see Stewart and Barger (2002).

Range limits of many BR and Coastal Plain plants join in this area (Maceina et al. 2000). Plants generally associated with rich, moist mountain soils grow in the coves among mountain longleaf pine ridges, including ginseng (*Panax quinquefolium*), galax (*Galax urceolata*), mountain laurel (*Kalmia latifolia*), wild ginger (*Hexastylis* spp.), trilliums, and umbrella magnolia (*Magnolia tripetala*). Coastal plain and sandhills plants ranging from the xeric-site-loving prickly pear and turkey oak (*Q. laevis*) (Varner 2000) to the swamp-loving fetterbush (*Lyonia lucida*) (Greear 1986) and sweetbay (*M. virginiana*) are found here too.

The Future

Landscape changes in the mountain longleaf pinelands are accelerating at an alarming rate. Rough mountain land that 20 years ago sold for \$300 per acre is selling for 10 times that now, as the area's population grows and folks are building homes and second homes on ridges with views of the valley.

Much land is still held by timber companies, and hopefully hunting leases will continue to be a lucrative business and provide additional income to landowners and incentives to keep lands wild. When I was a boy, there were very few hunting leases in this region. I had one of the first in Polk County back in the early 1980s, and paid \$.20 per acre for it; that same land and land like it is leasing for around \$6 per acre today -- and good leases and clubs are hard to find or join.

Our deer population has grown from 5-10 per square mile when I was a boy (I'm 42-years-old) to 20-40 per square mile today, with more in and near the farmlands, and less in the mountains. We produce some really nice bucks, especially where the herd is managed well. One exceptional buck killed in 1988 that was confiscated by the Georgia Department of Natural Resources was poached off the Cartersville Fault in Haralson County. At only 3.5 years-of-age, it was barely mature, yet it scored a phenomenal 164 - 13/16 points on the Boone & Crockett scoring system (Bud Jones Taxidermy; Tallapoosa, GA; personal communication). Bucks generally reach peak antler development at 5.5-7.5 years-of-age.

Three things make big bucks: nutrition, genetics and age; we have excellent nutrition and genes, but most of our bucks have in the past been shot at 1.5-years-old. Today many hunters are letting small bucks go, and the result is an increase in the number of large-antlered bucks being taken.

Turkeys were restocked in the early 1980s in Georgia, and the results have been phenomenal; we have flocks on most all suitable habitat, and even some on poor habitat.

The major ridges along the edge of the R&V drop off via spur ridges into the bottomlands, many of which are pastures or planted in wildlife-friendly crops such as corn, soybeans, and/or winter grazing. Double-cropping corn, and especially soybeans, with wheat is beneficial to game. The deer tend to bed on the ridges in the day and feed in the bottoms at night, and the turkeys do the opposite, roosting on the ridges and coming to the pastures and fields in the day.

Clean-farming, plantation forestry, fire-suppression and other factors have decimated bobwhite quail, which were still fairly plentiful as recently as the early 1980s. Few people are seriously managing for quail around here now. As times passes, abundant quail populations will be determined by the frequency of fire.

Deer and turkey hunting are what supports this area's hunting leases, and so wise management of these species can help us protect our longleaf and other wildlands.

Economic incentives to keep private lands wild are crucial. Aldo Leopold (1939) recognized this when he wrote, “Conservation means harmony between men and land. When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation. When one or the other grows poorer we do not.”

Coyotes invaded this area about the same time that turkeys were stocked, and although we feared they would stymie the turkey recovery effort, they have not seemed to impact it at all. Most coyote predation on deer is in the spring fawn-dropping season, or in the fall when crippled or lost deer are scavenged. Not liking invasive exotic species at all, I resented the coyote when it first arrived, but I’ve changed my mind in admiration of this adaptable omnivore, and now look at it as an ecological replacement for the red wolf, which we’ll likely never be able to restore to these lands. If the red wolf can be restored anywhere, it will be in huge wildlands such as the Alligator River National Wildlife Refuge on the North Carolina coast. Fleet-footed predators like coyotes are what made deer swift over the millennia, and maintaining at least one such predator is vital to keeping deer wild and swift over the evolutionarily long term (Stowe 2001).

Free-ranging hogs were extirpated decades ago in this area, but have been released in the Borden Springs area in the last few years. With a gestation period of three months, three weeks, and three days, they have proliferated. They will make longleaf restoration more difficult, in addition to polluting springs and degrading sensitive habitats, and possibly spreading diseases like swine brucellosis and pseudorabies to hog farms. Releasing swine should be condemned in the strongest possible manner through enforcement and education.

Other new critters include the red imported fire ant (*Solenopsis invicta*) and the armadillo (*Dasypus novemcinctus*) -- the former a pestilence and reminder of the hazards of moving species outside their native ranges, accidentally or on purpose -- and the latter a reminder that species’ ranges change naturally, and that this change will always be with us.

We’ve been responsible for the demise of the chestnut and the near disappearance of mountain longleaf, and as a result for the loss of ecosystem resilience. Invasion of oaks and other hardwoods on chestnut and longleaf sites may be a fragile phenomenon that will perhaps be crippled by diseases such sudden oak death (*Phytophthora ramorum*) or insects such as the gypsy moth (*Lymantria dispar*). By retaining the species adapted to the land, we lessen the chance of environmental catastrophe.

We probably have less than 100,000 acres of mountain longleaf left, and I reckon most of that is more fire-suppressed and more threatened by so-called “development” than longleaf in other parts of the species range. We are not only losing our wildlands, but we are also losing their connectiveness, and crucial management practices are being challenged.

Ecosystem integrity can be defined as a function of three factors: (1) natural processes such as streamflow, fire and predation; (2) native species composition, and (3) natural structure (Noss 1990). Fragmentation, dams and other large-scale watershed alterations, and threats to the ancient practices of hunting and to the ability to light fires on the land threaten these key processes, which in turn affect species composition and forest structure.

We need to protect big tracts; we need to connect them; and we need to be able to manage them properly. Protecting isolated postage stamp parcels may make folks feel good, but if that's all we do, then we may end up saving the crown jewels but losing the crown" (Kohlsaas 2001).

Both public and private lands are part of the conservation equation, as are easements as well as fee simple acquisition. Economic incentives to keep wild land wild for wildlife [sic] can include tax incentives, carbon sequestration credits and other air (or water) quality incentives, timber products, pine straw raking, and nature-based tourism, which includes hunting as well as other recreation. The myth that land protection is inversely related to economic well-being has been debunked (see, e.g., Lerner and Poole 1999, or Donella Meadows' extensive works), but few politicians seem to recognize that fact. We need to re-examine the definitions of the terms "progress" and "development." Thus far, progress has been defined as a "steady improvement, as of a society or civilization" or to "advance;" and the term develop has been defined as "to improve the quality of" (Costello 1993). Yes, we need to rethink the way we use these words.

We need to be extremely careful in how we promote economic use of natural resources (Geist 1994), and to not place too much faith in economics as a tool to preserve land, as vitally important as it is. We must also promote the value of natural areas for reasons beyond the scope of finance. Economics are inescapable, but if we value *only* the things the market tells us to, we risk losing something much more precious than anything tangible -- the ancient connection that lies deep in our psyche and is essential to our well-being -- our precious link to the Earth that soothes our souls. Aldo Leopold (1949) described the perils of losing our connections with the natural world in his conservation classic, *A Sand County Almanac*, when he warned, "There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace." We must reconnect with Nature in ways both tangible and intangible, and value Nature for its own sake, for its intrinsic value. And in the end, this paradoxically will ensure our own survival.

Rhett Johnson laments the fact that our schoolchildren learn lots about the wonders of the tropical rainforest, yet many remain unaware of the disappearing treasures of the longleaf fireforest in their backyards. Most adults are also ignorant of the wonders of our mountain longleaf ecosystem.

Despite mainstream scientific consensus that fire suppression is causing mountain longleaf to be supplanted by hardwoods and loblolly pine (Southern Appalachian Man and the Biosphere Cooperative 1996), some environmental groups (who do great work in

other arenas) actually fight longleaf restoration on our public lands. A few years ago I read in a newsletter how one of these groups (WildLaw) had won a battle against the US Forest Service over a plan to replace hardwoods with pine plantations on the Talladega National Forest. I found out that what actually had been blocked was a restoration project to restore mountain longleaf to fire-suppressed sites invaded by hardwoods. Now that's a whole lot different from clearing hardwoods off a proper hardwood site and then replacing them with thickly-stocked loblolly to be cut on a short-rotation, but that seemed to be what the group thought it had nobly prevented. This type of twisted anti-management logic that equates a loblolly pine plantation biodesert with a fire-maintained longleaf pine ecosystem epitomizes an abysmal mindset that considers any type of human intervention "un-natural," no matter the cost to biodiversity. The incident is all the more disconcerting considering that WildLaw funded Hill's (1998) aforementioned study that showed greatest breeding bird diversity and abundance of breeding birds on the Talladega National Forest to be found not only in mature longleaf, but also in "recently-planted longleaf pine sites," as compared to hardwood or hardwood/pine forests. I just learned of a movement by the Sierra Club to "Save the Hardwood Forests of North Alabama." Sierra Club has a phenomenal conservation record, and I almost always support their efforts, but I wonder why they and other folks never press for restoration and maintenance of the mountain longleaf pine forest, which is much more precious than any hardwood forest I am aware of in the Southern Appalachians. Leopold (1942) identified the root of the problem causing these well-meaning folks to fight longleaf restoration, as well as the solution, when he wrote, "I am convinced that most Americans have no idea what a decent forest looks like. The only way to tell them is to show them." It would be a shame if we end up with nothing worthwhile to show (Orr 1993).

Our mountain longleaf pinelands are a result of thousands of years of burning and other manipulations by man. To question whether the Indians purposefully managed and altered the landscape may be ethnocentric, since it exemplifies how Caucasians exaggerate their own power to modify the landscape while diminishing that of the Indians (Rolston 1991).

Vitousek et al. (1997) described the necessity of active management well when they wrote, "There is no clearer indication of the extent of human domination of Earth than the fact that maintaining the diversity of 'wild' species and the functioning of 'wild' ecosystems will require increasing human involvement." This is especially true in the SE, where many intact ecosystems are the direct result millennia of active management. Noss and Cooperrider (1994) cautioned against inaction in certain ecosystems, "... perhaps the key principle for managing biodiversity is prudence. Prudence does not imply hands-off management in most cases." And Howard (1974) took it a step farther, into the realm of culpability and resultant obligation, when he wrote, "Man has a moral responsibility to manage nature once he disrupts it."

We should never confuse management with goals, of course, and fall into the trap of viewing management as an end in itself, rather than as a means to an end. But manage we must, if we wish to retain the natural treasures of the fire-dependent mountain longleaf pine forest.

The Longleaf Alliance, Auburn University, the state of Alabama and the federal government have stepped up to the plate by promoting mountain longleaf and researching its uniqueness, by protecting the Talladega National Forest and by the creation of the new Mountain Longleaf Pine National Wildlife Refuge -- the state of Georgia and the University of Georgia need to do their part, and quickly. Georgia's responsibility and culpability for loss of this tremendously valuable ecosystem is enormous given the superb lands in the state and the fact that cancerous and insatiably-hyperconsumptive Atlanta is responsible for many of this region's woes, as it extends its malignant tentacles in all directions:

- 1) in search of water via interbasin transfers and proposed dams on the few unobstructed streams we have left, such as the upper Tallapoosa River;
- 2) by impeding our ability to conduct prescribed burns (burning is now prohibited in much of northwest Georgia from May through September because of Atlanta's air quality problems, which are among the worst in the nation) and to otherwise manage this land through imposing its rurban attitudes on this area;
- 3) by reducing opportunities to continue the ancient ritual of hunting, which is not only an irreplaceable management tool, but also, for many of us, a crucial cultural practice and icon, and a vital link with the land; and;
- 4) by sucking our lands up with its insatiable appetite. Atlantans and folks working there commute 100,000,000 miles per day, the metro area is larger than any other city in the history of civilization -- 110 miles north to south and 70 miles east to west -- and there is no serious plan in the works to limit any of this metastasis. A study my agency conducted in the Charleston, SC area showed that for each increment in population growth there was a 4-fold increase in development (based on impervious surfaces like roofs, cement and pavement). A similar relationship, or worse, likely exists in the Atlanta area.

Of its plan to sprawl, megalomaniac Atlanta brags, "... there are no natural barriers such as mountains or large bodies of water to impede the city's growth," (http://www.sos.state.ga.us/tours/html/atlanta_history.html), and the city seems blinded by greed as well as both ignorant and apathetic to the environmental destruction it wreaks in all directions.

Matthews (1992) defined the term "rurbanization" as "the invasion of affluent urban and suburban-oriented people into rural areas, looking for a self-defined 'country' lifestyle, while importing urban attitudes and values and expecting urban amenities," and discusses how such conflict "tears apart the fabric of rural communities, and often destroys the very nature of the 'country' experience originally sought, though few rurbanites realize it." I think Matthews hit the nail on the head.

Affecting “rurban” activities is crucial to protecting mountain longleaf, and doing that will be a monumental task. Education of Atlantans and other “rurbanites” about the special nature of what we have is imperative. We need to publicize what we have and how it needs to be managed, and we need to get folks out here to see it. It can be a Catch-22 -- by increasing visitation we increase impacts on the land, but without visitation and the accompanying public support, we will lose it anyway. We have no choice but to try if we want to restore and maintain this quintessential part of our Southern natural heritage, and to keep mountain longleaf from being reduced to a few novelty trees in people’s yards.

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