

## **CHAPTER FOUR AFFECTED ENVIRONMENT**

### Introduction

This section provides a description of those elements of the environment that would be affected in some manner by the alternatives. This discussion is not meant to be encyclopedic but rather a summary of information excerpted mainly from secondary sources. The source documents used are incorporated by reference and are on file at the National Area. A brief description of the surrounding region is presented first, followed by a discussion of the National Area.

### The National Area in its Regional Context

#### ***Communities and Transportation Routes***

The National Area is located approximately 70 highway miles north and west of Knoxville in portions of Fentress, Scott, Pickett, and Morgan Counties in Tennessee and McCreary County in Kentucky. The counties surrounding the National Area may be characterized as having scattered, low-density rural community development with no major urban areas. Oneida and Jamestown in Tennessee are the largest towns (1990 census population of 3,502 and 1,862, respectively), with Whitley City, Kentucky and Huntsville in Tennessee being two of the other larger towns. Scott County, TN had a 2000 census count of 21,127, a 15.1% increase over 1990; Pickett County, TN had 4,945, a 8.7% increase; Fentress County, TN had 16,625, a 13.3% increase; McCreary County, KY had 17,080, a 9.5% increase; and Morgan County, TN had 19,757, a 14.2% increase.

These towns and other, smaller communities along the main highways provide services to business and pleasure travelers into and through the region, including visitors to the National Area. Motels, bed-and-breakfasts, and restaurants of all types are available. Most of these are but a few miles from the boundary of the National Area.

There are a number of instances where private lands adjacent to the National Area are being subdivided for vacation homes and primary residences—an indication of a growing awareness of the attractiveness of the National Area. Land use planning for the surrounding local jurisdictions has been done some years ago, but implementation through zoning and subdivision regulations has only been accomplished for the larger towns. A recent Tennessee law requires needed county-level growth development planning.

The larger communities are found along the two US-marked highways running north-south on both sides of the National Area. State-marked routes running through or near the National Area connect these highways. Approximately twenty-five miles separate the National Area from interstate highway 75 and slightly more from interstate highway 40.

Except for Highway 297, Kentucky and Tennessee each own the rights-of-way of the state roads within the National Area. The counties have some 57 miles of road rights-of-way that appear on county highway maps within National Area boundaries.

#### ***Land Use***

Coal mining was previously mentioned regarding its presence and impacts around the National Area, particularly the New River headwaters. It is noteworthy that the majority of historic and current coal mining in Tennessee has occurred and still occurs within the Big South Fork watershed, especially in the New River drainage. Approximately 25,100 acres of unreclaimed abandoned coal mines exist in the Tennessee counties adjacent to the National Area, and there are about ten abandoned surface coal mine sites in McCreary County, Kentucky. Most of these sites were mined prior to 1977, before the Surface Mining Control and Reclamation Act required reclamation of mine sites. (NPS, 1997a)

Timber production is a major land use adjacent to the National Area. This includes smaller, privately owned tracts, large holdings owned by industrial forest companies, and publicly owned lands managed by the US Forest Service. Timber markets in the nearby Tennessee region include approximately 26 sawmills and 16 secondary manufacturers, according to 1996 information. Most are able to use the lower grade hardwoods that characterize much of the second growth forests of the region. Hardwood flooring and log homes are major industries in Scott County. (NPS, 1997a)

Oil and gas production is a significant resource use in the watershed counties. Large fields are adjacent to and extend into the National Area, mostly in the southern portion. In 1994, 82% of Tennessee's total oil production and 60% of its total gas production came from watershed counties. In 1992, there were 788 producing oil wells and 529 producing gas wells in this area. There are currently about 300 wells of both types within the National Area boundary. (NPS, 1997a)

Agriculture other than forestry occurs on less than 20% of the land in adjacent counties. Most of this is dedicated to hay production, livestock grazing, and only a very little row-cropping. (NPS, 1997a)

Adjacent public lands include the Daniel Boone National Forest and Pickett State Rustic Park and Forest. The National Forest boundary totally encompasses the Big South Fork NRRA within Kentucky, although many areas immediately adjacent to the National Area are privately owned. Forest Service-administered lands are essentially solid along the National Area's western edge in Kentucky and also along the eastern side, north of highway 92. This area is in the Stearns Ranger District and offers campgrounds and trails for recreation in addition to its other uses of timber, wildlife, and water. Specific cooperation is necessary on trail and road use between the two areas, in addition to other aspects of land management.

Pickett State Rustic Park and Forest lies adjacent to the west boundary and consists of 11, 752 acres. Of this total, 865 acres are managed by the Tennessee State Parks Division and include an area developed in the 1930s by the CCC with cabins, a campground, trails, and a recreational lake. The Tennessee Division of Forestry manages the remainder of the area for uses including timber harvest. As with the National Forest in Kentucky, cooperation is maintained on land and visitor use management issues including trail uses between the areas.

Scott State Forest is completely surrounded by the National Area. It is managed by the Tennessee Division of Forestry to provide a genetically superior white pine seed stock. There have been discussions of NPS acquisition of this area but the state is still interested in maintaining seed production and even expanding it on currently unplanted state acreage. Its location surrounding the intensively used Bandy Creek campground, including trail development and use in the state forest by National Area visitors, has not been a significant concern to date. Continuing cooperation is crucial.

The National Area is surrounded by other regionally important recreation sites, which provide a wide variety of visitor experiences. Some of them offer similar opportunities to those offered at Big South Fork. Some of the larger publicly owned areas are listed below. Not included are state wildlife management areas and large privately owned areas cooperatively managed with the states as public hunting areas.

- Lake Cumberland, with its two state parks
- Dale Hollow Lake, and its associated state park
- Cumberland Falls State Resort Park
- Daniel Boone National Forest
- Pickett State Rustic Park and Forest
- Obed National Wild and Scenic River
- Frozen Head State Natural Area
- Norris Lake, and its associated state park
- Cumberland Gap National Historical Park
- Standing Stone State Park
- Lone Mountain State Forest

The National Area functions within this network of areas, and in an even larger grouping that includes Great Smoky Mountains National Park, the Cherokee, Nantahala, and Pisgah National Forests, Mammoth Cave National Park, Little River Canyon National Preserve, and New River Gorge National River. To some extent, opportunities available at the National Area reflect its role within this network, and this is appropriate. However, as discussed in the Required Management section, the National Area has rather specific purposes for its establishment, as expressed by Congress, as well as quite specific management directions in its legislation. This provides guidance for many aspects of planning and management, with some aspects being given very specific direction.

## Natural Resources of the National Area

### Geology, Physiography, and Soils

Big South Fork National River and Recreation Area encompasses approximately 125,000 acres of rugged terrain on the Cumberland Plateau in northeastern Tennessee and southeastern Kentucky. The Big South Fork watershed lies within the Cumberland Plateau physiographic province, which is the southern portion of the Appalachian Plateaus structural province. The geology of the National Area is characterized by parallel, horizontally-bedded sedimentary rock of Pennsylvanian age overlaying Mississippian age rock. The Pennsylvanian rocks are predominantly sandstone and shale, and include siltstone, conglomerate, and coal. Oil and gas deposits associated with the Mississippian age limestone are found in many areas within and outside the southern portion of the National Area. There are an estimated 100 abandoned deep coal mine openings and associated spoil piles within the National Area. Mine reclamation efforts, funded by the Office of Surface Mining, have concentrated on areas having visitor access. Approximately 300 active or abandoned oil or gas wells and an unknown number of unmapped wells exist within the National Area. Mineral development is a possibility on the 18,900 acres where previous owners have retained mineral rights, subject to the National Area legislative restrictions and Federal regulations.

The upstream topography of the National Area is characterized by a dendritic drainage pattern and narrow, v-shaped gorges. The focal point of the area is the massive gorge with its many sheer bluffs at the gorge rim towering over wooded talus slopes and the naturally fluctuating river and tributaries below. The valleys are dotted with huge boulders broken from the cliff faces above. Streams include stretches of fast, rugged whitewater and quiet pools. Weathering processes have produced an impressive array of rock formations, including arches, mesas, chimneys, cracks, and rockshelters. Prior to National Area establishment, Tennessee designated Twin Arches and the Honey Creek area as State Natural Areas because of their superlative geological and other natural attributes. The gorge, as defined by the establishing legislation, is roughly one-half of the total acreage of the National Area.

Soils are weathered from the broad, massive and acidic sandstone caprock. There are two main soil groups in the National Area: the Ramsey-Hartsells-Grimsley-Gilpin complex located immediately adjacent to the gorge, and the Hartsells-Lonewood-Ramsey-Gilpin complex found on the plateau. They are generally acidic, thin, and stony but richer on the floodplains. (Primary sources: US Army Corps of Engineers, 1980; NPS, 1997a) No reference is made to area soils as "prime" or "unique."

### Water

The Big South Fork River begins within the National Area at the confluence of the New River with the Clear Fork and flows northward through the National Area for approximately 49 miles. It is free-flowing for about 37 miles until it is affected by the headwaters of Lake Cumberland. The Big South Fork watershed upstream of the northernmost National Area boundary covers approximately 1,123 square miles, primarily in Fentress and Scott Counties, Tennessee, and McCreary County, Kentucky. Smaller areas of Anderson, Campbell, Morgan, and Pickett Counties, Tennessee, are also included in the National Area watershed. The National Area includes only about 17% of the total drainage area. Other than small farm ponds and a few local water supply reservoirs within the watershed, there are no large artificial impoundments upstream to regulate flow or to trap

suspended sediments. Lake Cumberland, at the lower end of the watershed, is managed by the US Army Corps of Engineers, which maintains flowage easements over approximately 177 acres within National Area boundaries.

Flows are highly variable due to the steepness of slopes, relative impermeability of exposed rocks, and the thinness of soils. Flow levels relate directly to seasonal and storm event variations. Highest flows occur in the winter (January – March), and low flows in the late summer and fall (August – October). The average annual flow at the one US Geological Survey gauge station in the National Area near Stearns, Kentucky, is 1,760 cubic feet per second (cfs). The maximum discharge recorded here was 93,200 cfs and the minimum was 11 cfs. A minimum of 800 cfs is needed for rafting through the main gorge and 10,000 cfs is the recommended maximum for safe rafting.

The geology of the area is a limiting factor in terms of water availability. There are limited water resources on the plateau because of the low producing formations. Lack of reliable groundwater in the watershed has resulted in a search for other options of water supply for surrounding communities. This search has included consideration of upstream impoundments and also direct withdrawals.

Floodplains have not generally been delineated in the National Area; however, in the headwater areas, slopes are steep and floodplains are not well formed. Minor floodplains generally occur the farther downstream one proceeds. Several recreation sites in the main gorge are in the 10-year floodplain.

Wetlands also have not yet been completely inventoried. Certain National Wetlands Inventory maps have been completed. The Tennessee Wildlife Resources Agency is identifying wetlands over five acres from aerial photography. The Kentucky Division of Water has provided estimates of wetland acreage totaling approximately 530 acres, not including lake-type wetlands associated with Lake Cumberland.

National Area waters are generally considered good quality; however, acid mine drainage and excessive sediment from logging, substandard road construction, and other past and present ground disturbing activities significantly affect certain tributary streams and to a lesser extent the Big South Fork. Agricultural chemicals also contribute negatively to water quality. In general, streams in the western portion of the National Area watershed are less disturbed than streams in the eastern and southern portions. Impacts in the eastern and southern areas are more frequent and severe because coal mining, logging, and stormwater runoff are concentrated in these areas (NPS, 1986). The Big South Fork River has nearly twice the dissolved solids and suspended solids, and 2.5 times greater sulfate yield as a comparable unmined river basin (Evaldi and Garcia, 1991). Acid mine drainage impacts are most notable in Bear Creek and Roaring Paunch Creek. Sediment impacts are evident in these streams, New River, and several others. The New River is a slowly recovering system, as land stewardship in general becomes more compatible with water quality goals. Threats continue, however, in the New River headwaters as coal mining has seen a recent resurgence. Even inside the National Area boundary, a large portion of the New River corridor remains in private ownership and is the location of a major oil well field. Much of the corridor is designated gorge. A special reclamation effort is being made for the Bear Creek watershed in Tennessee by numerous agencies, communities, organizations, and landowners, under the leadership of the Natural Resource Conservation Service. The National Area also has undertaken remediation studies of selected sites where contaminated mine drainage is of concern.

Tennessee and Kentucky have anti-degradation and non-degradation policies, respectively, and both include the Outstanding National Resource Waters (ONRW) category of protection. Both states have designated their portions of the Big South Fork River as an ONRW. Kentucky has also recognized the section of the Big South Fork from the state line to Blue Heron mine as a Kentucky Wild River.

Kentucky and Tennessee have stream use classification systems to protect surface water quality. Water quality criteria values are specified for each stream use. Tennessee has classified all streams within the National Area for primary contact recreation and fish and aquatic life. Kentucky classifies all National Area streams for primary contact recreation and for either warmwater or coldwater aquatic habitat. A number of streams in the National Area in both states do not meet standards, primarily due to acid mine drainage and/or

sediment. Some of the streams have been identified as impaired streams, pursuant to the Clean Water Act. (Sources for this summary of water resource information: US Army Corps of Engineers, 1980; NPS, 1997a)

## General Vegetation

The general forest type is mixed-oak with mixed-mesophytic pockets. This type is divided into an upland community on the plateau and a ravine community. The upland vegetation types range from red maple-dominated stands on poorly-drained flats to Virginia pine-dominated stands on dry ridges and cliff edges. On the broad flats and gentle slopes are mixed oaks with hickory. Ravine communities are generally dominated by more mesic species—beech, sugar maple, and yellow birch—with oaks on the middle and lower slopes. Hemlock is prominent in the narrow gorges and along streams. River birch and sycamore typify the floodplains.

A wide variety of specialized habitats exists on the floodplains, in protected coves and ravines, on moist north-facing slopes, and on the sandstone caprock with dry, shallow soils. The rugged topography and moist, moderate climate combine to produce a great variety of microclimatic influences due to slope, orientation, and exposure.

Because of logging in the early-to-mid-20<sup>th</sup> century, most of the forest areas are 2<sup>nd</sup> or 3<sup>rd</sup> growth. As a result, mature forests and groves of particular scenic interest are rare. Due to inaccessibility, several small areas containing impressive examples of 2<sup>nd</sup> growth floodplain, mixed-mesic, and hemlock forests still exist, mostly in the more northern coves of the National Area. (US Army Corps of Engineers, et. al., 1974; NPS, 1997a)

Of note is the widespread damage caused between 2000 and 2002 by pine beetles. Dead standing and fallen trees remain virtually everywhere in the National Area where Virginia pine stands existed prior to the infestation. The safety hazard of falling limbs and trees is still significant although trees have been felled in all areas where visitors congregate. Many trails and some back roads will remain hazardous until the dead trees are down. The visual impact of so many dead trees is significant.

## General Terrestrial and Aquatic Animal Life

The variety of natural conditions combine to provide a high diversity of habitat. Sixty-eight species of fish, 215 taxa of macroinvertebrates, and 23 species of mussels have been documented in recent surveys within the National Area. Game fish include resident native channel catfish, longear sunfish, muskellunge, rock bass, and smallmouth bass. Walleye, striped bass, and white bass migrate upstream from Lake Cumberland; and brown and rainbow trout have been stocked in three streams by state agencies. Mammals hunted in the National Area include white-tailed deer, raccoon, and gray squirrel. Game birds hunted include ruffed grouse, mourning dove, and turkey. Non-game species are plentiful and include a variety of salamanders, and various predators such as bobcat, gray fox, and the red-tailed hawk. Black bear have been re-introduced on an experimental basis, with analysis still continuing. Exotic wild boar exist in the area but data are lacking.

The diversity of habitat notwithstanding, water pollutants adversely affect aquatic diversity and populations. The macroinvertebrate and fish community is still essentially non-existent in Bear Creek, and other streams are suspected to be in a similar condition. Other effects of a lesser degree are generally known, but data are lacking to clearly identify pollution sources and direct and indirect impacts.

Mussel species are the most jeopardized and rapidly declining faunal group in the United States. Twelve of the nation's 300 species are now extinct, and over sixty-seven percent are listed as endangered, threatened, special concern, or are being considered for listing. The National Area currently has 27 documented species, five of which are federally listed as endangered. In the southeast, only the Clinch and Green Rivers contain this level of diversity, and only two other NPS units in the country have greater diversity. In the National Area, sedimentation and chemical pollutants are the primary threats to these species. (US Army Corps of Engineers, 1980; NPS, 1997a; NPS, 1997b)

## **Endangered Species and Other Listed Species of Concern**

Already mentioned are the five mussel species known to be endangered in the National Area. The duskytail darter is also known to be in National Area waters. Other federally listed animal species that may be in the watershed are Anthony's river snail, slender chub, Palezone shiner, blackside dace, Indiana bat, American peregrine falcon, red-cockaded woodpecker, and the bald eagle. Three federally listed plants are known to be in the National Area, i.e., Cumberland sandwort, Cumberland rosemary, and Virginia spirea. The green pitcher plant and American chaffseed are thought to be within the watershed. Approximately 100 state listed endangered or threatened species may be located in the watershed. The river otter, which has been re-introduced into the National Area by the Tennessee Wildlife Resources Agency, is a state-listed endangered mammal. It is NPS policy to also protect state-listed species. The stretch of the Big South Fork from Leatherwood Ford to Bear Creek is noteworthy because its water quality and streambed characteristics combine to provide critical habitat for several listed plant and animal species. Detailed lists are available in National Area files.

## **Natural Resource Data**

Important natural resource inventory information and management strategies are needed in many subject areas. Foremost among these relate to water resource management. The National Area has prepared a Water Resource Management Plan, which addresses problems and data needs relating to the aquatic systems of the Big South Fork drainage. Data and strategies are also needed for managing mineral resources, more effectively protecting sensitive plants and animals, and restoring sustainable native vegetation and wildlife populations.

## **Cultural Resources of the National Area**

### **Archeological Record**

The rugged terrain and relatively infertile soils of the general Cumberland Plateau area resulted in its use as a transportation corridor and hunting area by the American Indians who chose to live in the more fertile Tennessee and Ohio River valleys. No remains of permanent American Indian settlements have been found. Without question, however, the numerous shallow caves, or rock shelters, provided ready cover for temporary use. Unfortunately, through the years most of these sites have been looted by illegal "pot hunters." (NPS, 1996)

No cultural chronologies exist for the National Area, but surveys indicate pre-European occupations spanning the early Paleo-Indian Stage cultures of 12,000 years ago to approximately 400 years ago. The number of archeological sites within the National Area is very large. It is estimated, based on sampling, that approximately 10,000 sites exist within the boundary. About one-half of the known sites are historic, i.e., post-contact, the rest being pre-European.

### **Historical Record**

A major influx of settlers began in 1812, with farmsteads developing throughout the Big South Fork gorge and, by the 1880s, on the plateau as well. Remnants of these homesteads and communities are found throughout the National Area in the form of stone walls, structural remains, road traces, and remnants of orchards and fields. Among the several historic farmstead sites in the National Area, 13 buildings and other structures have been determined eligible for listing in the National Register of Historic Places. Four component landscapes have been identified in a recent survey through the NPS Cultural Landscapes Program.

In 1880, educator and author Sir Thomas Hughes founded the colony of Rugby on the plateau near Clear Fork. It existed for approximately 20 years as an experimental utopian community for the younger sons of English gentry, who were traditionally excluded from family inheritance. The colony thrived briefly, reaching a

population of about 450. The town is now a National Register District and is adjacent to the National Area boundary. The NPS cooperates with the town in visitor education programs.

The National Area is also marked by industrial development, which also began in 1812 with the drilling for salt and the mining of niter for the war effort. In 1818, the first commercial oil well in North America was drilled here. This well and the nearby saltworks are potentially eligible for National Register listing. But it was the presence of coal and timber that left their mark the most on the Big South Fork landscape. Their extraction, extending from the 1880s to the 1960s, resulted in lumber and mining towns, railroad spurs, mine sites, haul roads, and the erosion and other pollution that still affect the area. Several structural and engineering sites are eligible for the National Register, and one of these, the restored Blue Heron mine site, is now a primary visitor attraction.

There are 56 known cemeteries and gravesites in the National Area, which represent another type of cultural resource. They provide a record of the cultural evolution of the region. Some of the cemeteries are still owned and maintained by others, while some grave sites have been abandoned and are now owned by NPS. NPS provides access to cemeteries in the gorge on a limited basis.

Surveys and studies, including those concerning natural resources, have produced thus far a collection of over one-hundred thousand items. This collection is currently housed in several locations, including non-NPS facilities. The items in the collection, and more to come as studies and inventories continue, are of critical importance to historical and scientific research and public education related to the Big South Fork region. Better storage conditions at the National Area are needed for those items it has and for those it is expecting to receive from the other facilities. (US Army Corps of Engineers, 1980; NPS, 1996)

## Cultural Resource Data

Many data collection projects and studies are needed in the cultural resource area to provide additional information to better protect and manage the large and varied resource base included in the National Area. Inventories and surveys are needed, as are studies of specific resources, including identification of ultimate treatments. Determinations are needed whether and how to make resources available to visitors.

## Visitor Use of the National Area

Total visitor use of the National Area has stayed around the mid-800,000 mark for the five years prior to 2001 and increased significantly to 917,000 in 2001. Prior to 1995, there was a reasonably steady increase. Seasonal distribution of recreational use is typical for this part of the country where summers are quite warm and humid and winters are mostly cold with frequent rain. Summer visitation is heavy due to school vacations and is heaviest on weekends and holidays. Water uses are the most popular. Fall sees slightly more visitors because days are cooler and less humid, and there are fewer bothersome insects. Weekends are very busy, and fall colors draw the largest crowds. Winter is the time of the least visitation, although hunting and fishing are popular and whitewater enthusiasts take advantage of increasing river flows. Spring is the third most popular season after the fall and summer, with warming temperatures and usually peak conditions for river running.

The following is a sketch of National Area visitor use.

### River Use

The National Area was established, in part, to preserve the free-flowing Big South Fork and its tributaries. This system of rivers affords some of the highest quality rafting and canoeing in the eastern U.S. Whitewater rafting and kayaking generally occur in the upper reaches, upstream from Leatherwood Ford (TN 297), while canoeing occurs mostly downstream from Leatherwood Ford. Commercially provided trips are popular. NPS is committed to providing high quality experiences for visitors floating the National Area's rivers.

Whitewater uses occur mostly in the spring and are most popular with visitors from outside the local area. User education on safety and resource management objectives is important. A backcountry management plan is needed to address these objectives in terms of what can only be an increase in river use, with its attendant camping, rest stops, and accompanying waste issues.

Wading and playing in the river is a favorite summer pastime, particularly of nearby resident families. This occurs mostly at the approved access points, although many people hike along the rivers to favorite places. Safety is a concern because of the force of moving water and uneven bottoms. Due to the location of the larger streams, this use occurs within the legislatively defined gorge.

Fishing is seasonal and according to state regulations. It occurs in both the larger and smaller streams as well as in the headwaters of Lake Cumberland. Creek fishing is more popular with local residents than with regional visitors, and both fish the main rivers and Lake Cumberland. This is another "gorge" activity, except for the part of Lake Cumberland north of Yamacraw, and legislative restrictions on traditional motorized access to and along the rivers has curtailed this use in many locations.

Floating on smooth flowing stream stretches is more of a summertime, local resident activity, taking place on the upper portions of Clear Fork and on stretches downstream from Leatherwood Ford. Fishing is a common accompanying activity.

Motor boating on the slack waters of Lake Cumberland occurs largely in the summer but spans spring and fall. Boaters mainly from the local and regional area are likely to visit the National Area this way. Depending on lake elevations, which fluctuate seasonally, boats are able to go upstream to just below Devils Jump rapids, according to legislative provisions. Fishing is a primary reason for most of these outings. Jet skis have been a concern mainly because of the noise and water pollution, but national regulations prohibit their use in the National Area.

Hunting along the rivers for deer and waterfowl is popular for local and regional hunters. This is managed consistent with state regulations and the safety zones established by NPS. Vehicular restrictions imposed by the legislation have reduced the amount of this activity.

### *Trail Use*

Trail use, with its many varieties, makes up a large portion of the total visitor use to the National Area. These activities occur on over 300 miles of trails and many additional miles of roads. Some of these trails are single-use and many are multiple-use. Some trails connect to and are part of trails administered by others on adjacent lands. With the legislative restrictions on motorized vehicle use in the gorge, which is roughly one-half the total area, trail use is important to visitors and necessary to see most of the attractions. The John Muir Trail, the Sheltowee Trace, and the Twin Arches Loop Trail are designated National Recreation Trails. National Recreation Trails are designated by the Secretary of Interior or the Secretary of Agriculture to recognize exemplary trails of local and regional significance. Through designation, these trails are recognized as part of America's national system of trails.

Horseback riding is very popular. The National Area has achieved a reputation for being a premier riding area, and riders come from the local area, nearby states, and beyond. Many bring their own horses and camp at special campgrounds. Many of these are members of equestrian organizations and come for pleasure riding, although competitive events occur also by special permit. Visitors not having horses and who wish to ride may rent horses from a concessionaire inside the National Area or from licensed businesses outside. Pack trips for hunting, fishing, and just camping are also available and offer another means for visitors to have an extended experience in the backcountry.

Approximately two-thirds of the Area's horse trails are located in the area between White Oak Creek and the Tennessee state line and consist of 15- to 25-mile loops. Portions of the National Area don't have trail connections that would provide for better distribution and variety. Riding occurs in all but the coldest months,

and sunny winter weekends can still find riders enjoying the area. Horse-pulled wagons on marked routes are a specialized trail use and are popular with some local and regional visitors.

Maintenance of horse trails is a major work item for NPS staff. Proper design, installation, and maintenance are critical for resource protection as well as for rider safety and enjoyment. Resource impacts have occurred at stream crossings, on steeper terrain, and where riders (and other user group types as well) go off the trail to avoid boggy sites or downed trees. Because of the terrain, there are only certain places where trails can be located, and concentrations of use can also result in adverse effects. Riding groups often assist in trail maintenance.

Hiking is the other primary trail use. Hikers find significant opportunity to pursue their activity in the scenic, legislatively protected gorge. Trails are available on the plateau as well, and often provide access to some particular historic feature. There are short, paved trails leading from parking areas to overlooks, loop trails for day-hiking, and long-distance trails traversing much of the entire area, which provide backpacking opportunities. Hiking is mostly a use by visitors from outside the local area, who visit the area year-round. Spring breaks are a favorite time. Hikers can hike cross-country (off of trails), but trails receive the most use by far. Backcountry camping impacts on resources are the main concern.

Biking is currently allowed on three single-use, dedicated trails, all horse trails and marked multiple-use trails, and on all roads in the area. It is growing in popularity and the demand for additional available trails is increasing because of the concerns of conflicting use. Many of the roads and trails open to bike use are not really suitable because of the gravel or sand surface or heavy use by other user groups. Many who come belong to organizations and are from the local and regional areas. The dedicated trails were constructed and are maintained by one of the organizations. Increasing numbers of vacationers who pass through from other states come with their own bikes. Spring and fall are the most popular seasons for biking, as with most other activities.

Riding all-terrain vehicles (ATV) is a popular activity with local area residents. ATVs are currently used in the National Area on many of the graveled and old roads on the plateau. They also enter the gorge for recreational riding and during hunting season to get to sites for transporting game. Use on designated public roads leading to and within the National Area occurs and is contrary to law. Federal regulations require ATVs (all off-road vehicles) to be restricted to designated routes on all federal lands, and this plan considers and proposes acceptable routes to minimize impacts on resources and visitors. It is important to note that just the enforcement of the legislative gorge restrictions and state and county regulations will result in a reduction in the use of these vehicles within the National Area.

### *Sightseeing*

*The National Area has pleasant roadways, both paved and unpaved, for visitors to travel and enjoy a natural setting. Overlooks available a short walk away from parking allow scenic views of the gorge and the river below. Historic sites are also available for easy visits to view pastoral scenes and sites of past coal extraction. While these are available, the National Area is not considered a “touring” park where large numbers of visitors enjoy the area in a passive manner as they tour by passenger vehicle. The main roads either cross or dead-end into the area because of the terrain and because of the legislative restrictions on roads in the gorge.*

### *Camping*

Camping at Bandy Creek and Blue Heron campgrounds offers visitors the conveniences of improved campsites. Bandy Creek has about 190 sites and Blue Heron 45. The Station Camp and Bear Creek “horse camps,” each having about 25 sites, offer equestrians specialized camping facilities. Improved group campgrounds are also available, and groups also are allowed by special permit to camp in certain open fields. A small primitive campground is available at Alum Ford. Other than these areas, camping is allowed along some of the back roads and in the backcountry reached by foot or horse. Some amount of vehicle camping still goes on at sites within the gorge that have been used since before the National Area was established. This type of camping was very popular because of the desire to camp along the streams but has now been

curtailed by legislation. Recreational vehicle camping is showing steady increases and tent camping is decreasing. Backcountry camping is also increasing. Summer sees the most campers, but spring and fall weekends are also popular, particularly May and October. During the fall, hunters also add their numbers to those camping in the area. Camping in areas other than designated sites has resulted in minor amounts of resource impact, and increases in this activity could require measures to mitigate such impacts.

### *Hunting*

Hunters come to Big South Fork from long distances for large game, but most are from the local and regional area. Small game hunting is a local activity. Hunting seasons and limits are regulated and enforced by NPS in cooperation with the states, state laws having been adopted for the National Area. Fall and early winter and the spring turkey season bring hunters to the area. Hunting occurs in all areas except designated safety zones around developed sites. While hunting is available throughout the National Area, the legislative restriction on motor vehicle use in the gorge has effectively limited hunting to the plateau and nearby gorge areas easily reached by ridgeline back roads. Hunting by arranged pack trips is an option to some.

### *Other Activities*

Rock climbing, including rappelling, is an increasingly popular activity throughout the country, and the terrain of Big South Fork is attractive as a climbing destination. The extensive network of sandstone cliffs provides numerous opportunities, and recreational climbing is recognized as an acceptable way for people to enjoy the area. These same areas—along cliff lines and other, sometimes delicate, rock formations—also are important resources. They often are the sites for endangered and other rare species, and some species are cliff line-dependent. Some of the lichen mats on exposed rocks are extremely old and vulnerable. Archeological sites abound along the cliffs, and some formations are delicate enough to be damaged by this activity. Use of undesignated social trails to access climbing areas can result in damage to vegetation. A climbing management plan is needed to identify responsible use of the National Area while protecting important resources.

Nature study, such as photography, bird watching, and flower or plant identification, is enjoyed by growing numbers and occurs in many different areas. Frequently, such activities are a part of other pursuits such as hiking. National Area staff provides special programs for many of these activities. School groups are frequent participants.

Riding a sightseeing train into the gorge to Blue Heron mine from Stearns has been a popular, seasonal activity for many wishing to experience the trip in a manner reminiscent of earlier days. The non-profit McCreary County Heritage Foundation owns and operates the train, which travels the historic route. The route extends from a restored depot in historic downtown Stearns into the gorge through the redeveloped mining community of Barthell adjacent to the National Area boundary and on to the Blue Heron mining town site. This visitor access by rail was specifically provided for by the legislation. Expansion plans are being developed for extension north to Yamacraw.

National Area staff provides regular programs and sponsors special events to interpret the wide variety of resources available. Some of the events are annual occasions that draw attendance from long distances. The National Area legislation is different from most other NPS units' legislation in that part of its stated purpose is to interpret the area's resources for the public's enjoyment.

Rustic lodging in the backcountry, accessed only on foot or horseback, is provided by a concessionaire at Charit Creek Lodge. Located within the gorge in a scenic tributary valley, the lodge with its bunkhouses incorporates National Register-eligible historic log cabins providing accommodations for a maximum of 48. The National Area legislation specifically provides for continuation of this service, along with improvements, being careful not to change the character or exceed the carrying capacity of the approximate 30-acre site.

## National Area Operations

NPS currently manages approximately 115,000 acres within the boundary. Within this area, National Area personnel are responsible for the preservation, management, and interpretation of resources, visitor use management and protection, facility construction, and maintenance. Supplementing on-site operations is a large variety of coordination and cooperative arrangements with other entities that support the purpose of the area. These include arrangements with the McCreary County Heritage Foundation, Rugby, Barthell, adjacent public agencies and counties, concessionaires and businesses, universities, and user groups. Limited staff and funding make it necessary to obtain assistance in addressing management concerns.

Facilities in the National Area include four improved campgrounds, one primitive campground, one rustic lodge, six day-use areas, one horse stable, one interpretive center/visitor contact station located at Bandy Creek, one visitor contact station located on 9 acres in Stearns, eleven river access areas, and eight administration buildings. There are also almost 300 miles of roads and over 300 miles of trails. Approximately 180 miles of roads are unimproved dirt roads, 95 miles are graveled, and 20 miles are paved. Most of the roads and trails existed prior to government acquisition of the land and were not located or constructed to protect resource values. National Area personnel are continuing to bring these routes up to standard.

The National Area's base operational funding for fiscal year 2004 was approximately \$3,572,000.00.

Various land rights remain in state, county, private, or other federal ownership. Privately owned land remaining to be acquired totals approximately 5,900 acres. The use of these lands is sometimes inconsistent with the purposes of the National Area, often contributing to water pollution, mainly through soil erosion from land disturbing activities.

A 20-acre tract adjacent to Highway 297 between Oneida and the National Area was acquired by the US Army Corps of Engineers for administrative use. It remains undeveloped.

## Selected Area Highlights

The following are brief descriptions of selected area environments. The previous description of the National Area as a whole provides context and serves to supplement these area descriptions.

### **Yahoo Falls**

*This area was previously a US Forest Service Scenic Area. The site includes cliffs, waterfalls, rock shelters, and natural stone arches. Yahoo Falls, at 113 feet, is the tallest in the National Area and in the state of Kentucky. Its associated rock shelter is very large and contributes significantly to visitor interest. Vegetation is lush with large hemlocks and hardwoods above and large beech trees below in the ravines. The area offers picnicking, scenic trails, and access to the Sheltowee Trace National Recreation Trail.*

### **Alum Ford**

This site is forested and scenic with the bluff line above and the headwaters of Lake Cumberland below. The calm waters are conducive to passive recreation. Slope vegetation consists of mature and semi-mature oaks with open forest floor. Sugar maple, beech, and yellow birch characterize the shore areas. The site has a boat ramp, picnicking, shore fishing, and primitive camping (7 sites). The site adjoins Lake Cumberland. The Sheltowee Trace trail goes through the site.

### **Yamacraw/Highway 92**

On the west side of the river, this area provides boat access to a calm portion of the river influenced by the Lake Cumberland pool. On the eastern side, the area provides picnicking and access to the Sheltowee Trace trail. Some of the developed area is within the floodplain.

## **Worley**

This riverside area was a mining community and remnants of mining operations are evident, including mine tailings. Access, other than by river and the abandoned rail line, is through a narrow ravine and is difficult. Slopes are steep. The site primarily functions as river access for nearby residents but also serves as a stop for canoeists and a trailhead for hikers. Water quality on the site is an issue due to acid mine drainage. This is a site where remediation of mine effects is being planned.

## **Blue Heron**

Located on a larger expanse of floodplain, this area was a major coal mining site and included a small community. Today, the restored mining structures and interpretation of the community through exhibits attract many visitors. Access is by paved roads and by the sightseeing train from Stearns. River access, shore fishing, and access to trails are available. The site's natural resources have been affected by development although the present day natural setting of bluffs, forest, and river now provide a scenic backdrop.

## **Bear Creek Area**

This plateau area above and to the north of Bear Creek consists of two large, flat ridges of agricultural lands and hardwood forests. The area borders the gorge rim, and provides exceptional overlook views. The area is known for its rim edge views, equestrian campground and trails. The forested areas are mainly mixed hardwoods approximately 60 years old; however, there are small sections where old fields have become reforested in short-leaf pine. Some of these areas have been clear-cut within the past 10 – 20 years and are presently in the process of succession. The xeric gorge rim areas above Bear Creek are predominantly Virginia pine, while the northern portion of the area is a mature beech-hemlock community with some old-growth timber. A sandstone glade on the rim near Split Bow Arch has been identified as sustaining two rare plants. The area contains the Bear Creek Horse Camp, the Bear Creek Overlook, Split Bow Arch, the Newtie King homesite, and a gravel loop road and trails. It also provides administrative access to a river gauge.

## **Station Camp Area**

This is an area of wooded ridges and ravines. Tree cover consists of mixed deciduous and oak to a mixture with Virginia pine. The site also contains rock shelters where the plateau breaks at the gorge rim. There is some evidence of ancient upland lithic campsites. The area contains the Station Camp Horse Camp, trails, and river access via graveled road. The road to the river exhibits some severe erosion and areas of poor horizontal and vertical alignment. Endangered mussels are found at the Station Camp ford.

## **Twin Arches State Natural Area**

Twin Arches State Natural Area is a 1,500-acre tract formerly owned by the Stearns Coal & Lumber Company. It was designated a state natural area in 1974, primarily because of two impressive geological formations known as the Twin arches. This area protects the largest natural bridge complex in Tennessee, and one of the largest such complexes in the world. A high diversity of forest species, rockhouse species, and sandstone barrens species exists within the area, including the federally-endangered Cumberland Sandwort (*Arenaria cumberlandensis*) and State-threatened Lucy Braun's White Snakeroot (*Ageratina luciae-brauniae*). Scenic views of the surrounding forested upland and creek gorges are common.

## **Charit Creek Lodge**

This lodge and its supporting structures are located within the gorge at the junction of Charit Creek and Station Camp Creek. This is a rustic facility that provides food and overnight accommodations in a scenic valley setting. The lodge can only be reached by trail. The main lodge was erected in approximately 1816, and it and several other structures are eligible for the National Register. Several trails emanate from the lodge area.

## **Bandy Creek and West Bandy Creek**

This rather large area of plateau is woodland interspersed with openings of old farmsteads, fields, areas currently managed for visitor use, and the primary through highway, TN 297. The forested areas consist primarily of maple, oak, and hickory, with pockets of more mesic species, including hemlock, in ravines. Remnants of lithic material have been uncovered on many of the ridges. The Bandy Creek area is the largest visitor development area and includes a large campground with swimming pool and play structures, electric and water hookups, and restroom/shower houses. Group campgrounds are also provided as are stables for horse boarding and rentals, picnicking, a large variety of trails, and a small visitor information station.

## **Leatherwood Ford**

Adjacent to Highway 297, Leatherwood Ford is a primary river access area. It offers river access for canoeists and rafters as well as boardwalks along the river that are universally accessible. There are shallows for water play, trailheads, picnic sites, shore fishing, and restrooms/showers. The river's flood cycles have deposited broad alluvial terraces on its eastern bank. The vegetation is primarily deciduous, with two distinct zones, resulting from different levels of flooding. Sycamore, tulip poplar, and sweetgum occur in the lower areas, while red maple, black gum, white pine, holly, and sourwood are found in higher areas. Cove hardwoods are found on the slopes of the gorge.

## **Headquarters Area**

Located on TN 297 near the eastern boundary, this office complex is the National Area's administrative center. It consists of a mix of structures, including houses acquired with the land and buildings constructed since establishment. A 20-acre parcel located east of the National Area was acquired during the land acquisition phase specifically for administrative purposes. However, the existing complex is believed sufficient and there are no plans for using the outlying parcel.

## **O&W Railbed**

This railbed was once the rail link with Oneida that served logging and mining operations within what is now the National Area and ran as far west as Jamestown. With the general decline of the extractive industries in the area, the small communities and camps that grew up around the O&W disappeared. The railbed is potentially eligible for the National Register of Historic Places as a contributing industrial archeological resource. This resource includes the railbed cuts and fills. The graveled railbed currently supports passenger vehicle access from Verdun, near Oneida, to the bridge over the Big South Fork. Some vehicles are able to continue to the site of the bridge over North White Oak Creek. The portion from the eastern boundary to North White Oak Creek is within Scott County. The county has acquired and maintained a deeded interest in the former right-of-way. This interest is coupled with an implied dedicated easement in favor of the public to travel on the right-of-way to North White Oak Creek. Beyond this, the railbed lies in Fentress County and is considered legally abandoned. This portion is used as a trail. The entire railbed is within the legislative gorge and lies beside portions of—from east to west—Pine Creek, Big South Fork, and North White Oak Creek. The route was studied, as directed by Congress, for reestablishment of rail transportation or some alternative mode. Findings of studies by the US Army Corps of Engineers and by NPS indicated trail use was most appropriate. Currently known is the presence of a federally endangered mussel and a state-listed fish in North White Oak Creek, and there are state-listed plants and animals throughout the gorge. The condition of the railbed and its use has resulted in problems with erosion, water pollution, soil compaction, and vegetation damage. Scott County is planning some improvement of the portion from Verdun to the bridge over the Big South Fork.

## **Airport/Confluence Road Area**

*Confluence Road extends past the Scott County airport, through the wooded plateau ridge to a small parking area within the National Area used to access a trail leading to the confluence of the New River and Big South*

*Fork. The road is graveled and there are no other facilities. Several rare plants occur in the area of the river access and the federally endangered Cumberland Rosemary may also.*

### **Burnt Mill Bridge**

Located on the Clear Fork tributary of the Big South Fork, the site remains a popular riverside area for shore fishing, wading, picnicking, boat access, and baptisms. The riverbank is lined with large sycamores, and large oaks are found throughout the site. Boulders in the streambed, moderate rapids, and views to the bluffs above characterize the river in this section. Some lithic scattering is found in some areas of the site. A new bridge is being planned immediately downstream from the existing structure. This will result in some changes, but, overall, will enhance the public use area.

### **Honey Creek State Natural Area**

Accessible by graveled road and trail, this 109-acre natural area was set aside in 1970 by the former landowner, Bowater, Inc., as a Pocket Wilderness Recreation Area. In 1973 it was designated a State Natural Area by the Tennessee Division of Natural Heritage. The area was set aside primarily because of its rich forest communities that have been undisturbed for many years, as well as its numerous geological formations. The area is extremely scenic, with lush vegetation, streams, a waterfall, rock shelters, and picturesque views of the gorge and river. The area contains a high diversity of forest species, rockhouse species, and sandstone barrens species, including the Federally-threatened Virginia Spirea (*Spirea virginiana*) and possibly the Federally-threatened Cumberland Rosemary (*Conradina verticillata*). A parking area, information board, access ramp, and overlook are the only facilities.

### **Mt. Helen Road Area**

This area located on the plateau north and east of Potter Branch is a mixed-oak community, with open areas from the prior ownership. Access has been by graveled road off Mt. Helen Road and use has been informal trail use.

### **Joe Branch**

This area in the Clear Fork corridor is used for its horse and wagon trails, primitive camping, picnicking, and pond fishing. Access to the site is by four-wheel drive vehicle. The typical plateau vegetation in the area is thick and open areas are closing in.

### **Rugby Area**

Short destination and loop trails lead from Rugby into the National Area along the Clear Fork. Certain trails date back to the time when Rugby was founded. The upland areas include mixed oak and pine forest as well as open areas. Near the river, there are ledges, rock shelters, seasonal waterfalls and springs characteristic of steep slopes leading to the river. The ravine vegetation consists of mountain laurel, rhododendron, holly, big leaf magnolia and hemlock. Archeological sites have been identified within the area.

### **Brewster Bridge/Highway 52**

This site has been used over many years for river access and picnicking. The highway has been rerouted over a new high bridge spanning the gorge. The previous roadway and bridge remain. The small developed area is relatively narrow and wooded where not cleared for visitor use. Endangered mussels have been found in the vicinity of the old bridge.

### **Peters Bridge**

Picnicking and river access are available at this crossing of the Clear Fork at the southernmost tip of the National Area. Primitive camping and shore fishing occur. The site is surrounded with thick vegetation,

including hemlocks, mixed pine and oak and an understory of redbud, dogwood, mountain laurel, and rhododendron.

### **Zenith**

This site is tightly confined by the gorge along North White Oak Creek. The gorge walls are steep, where rhododendron, holly, big leaf magnolia and American beech can be found. White and Virginia pine are found on the alluvial terraces, while tulip poplar, red maple, and sycamore can be found between the bluff and stream. Mine openings, tailings and foundations still remain from the ca. 1913 settlement built adjacent to the O&W Railroad. While not specifically developed, the area is popular for picnicking, water play, fishing and access for river floating due to the relatively difficult run to Leatherwood Ford. A gravel road provides vehicle access. This site is used by some to access the O&W railbed by fording the stream.

### **Darrow Ridge Area**

Large portions of this extensive area in the southwest (including Tar Kiln Ridge) have only been acquired in the last few years. Logging and mining have occurred over the area, and the area has scattered oil and gas development activity with its associated wells, equipment, and access roads. Resource inventories have not yet been conducted but numerous natural attractions exist in this area, notably Laurel Fork (known locally as East Laurel) and its associated gorge. Horse riders and ATV users are the most prominent current users of the many old roads. Roads are generally in a degraded condition in need of rehabilitation for control of erosion and exotic plant invasion.