



Red River Comprehensive River Management Plan



Cumberland Ranger District, Daniel Boone National Forest, Kentucky

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Chapter 1: Introduction

Federal agencies charged with the administration of the National Wild and Scenic Rivers System are required to prepare a comprehensive river management plan for designated river segments to provide for the protection of the river values. This plan is designed to address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of the Wild and Scenic Rivers Act, section 3(d)(1).

The Red River Designation Act of 1993 (P.L. 95-625) amended the Wild and Scenic Rivers Act to designate 19.4 miles of the Red River as a wild and scenic river. Congress found that “the natural, scenic, and recreational qualities of the Red River in Kentucky are unique and irreplaceable resources; and the majority of the Red River corridor is within the Red River National Geologic area, which contains sedimentary rock formations unique to Kentucky and the United States, and should therefore be preserved for public enjoyment” (US Congress, 1993). The Act designated a 9.1 mile segment known as the “Upper Gorge,” extending from the Highway 746 Bridge to Swift Camp Creek, as a wild river, and a 10.3 mile segment known as the “Lower Gorge,” extending from Swift Camp Creek to the School House Branch, as a recreational river. (See figure 1 below for a map of the Red Wild and Scenic River corridor with overlapping designations and features).

At the time of this planning effort, the Red River and surrounding Gorge have been experiencing increasing levels of recreational use and overcrowding (Sharp 2014, USDA Forest Service 2014, USDA Forest Service 2018). As a result, many of the natural and cultural resources have sustained or are under threat of sustaining varying degrees of impairment, wear, damage, and vandalism from proliferation of unauthorized campsites and trails, user-created parking impacts to road infrastructure, abandoned campfires and wildfires, and other user impacts. Additionally, recent flooding events brought to the forefront concerns about climate change and the need to build infrastructure strategically and improve resource resiliency for future large weather events. The Red Wild and Scenic River needs proactive and adaptive management of these resources with planning to address visitor use and protect these resources for the future.

Purpose of the Comprehensive River Management Plan

The purpose of the comprehensive river management plan is to establish overall management direction to protect and enhance the values for which the Red River was designated (free-flowing condition, water quality, and outstandingly remarkable values). This plan establishes river corridor boundaries and incorporates river-specific management direction, user capacities, monitoring, and other management practices necessary to protect and enhance the river values. Adoption of the comprehensive river management plan occurs through issuing the accompanying decision notice for the Environmental Assessment.

Vicinity and Proposed Boundary Map

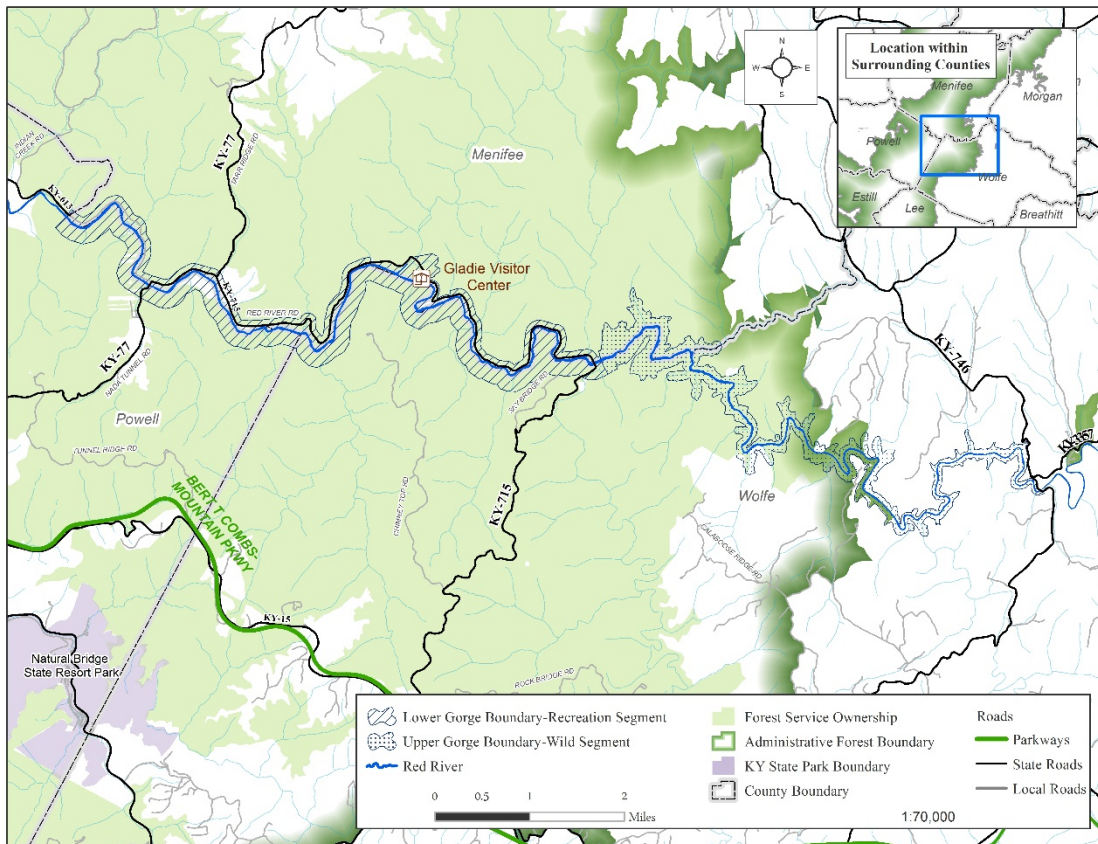


Figure 1. Map of Vicinity and Proposed Final Red Wild and Scenic River Boundary¹

¹ The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information contact Daniel Boone National Forest, 1700 Bypass Road, Winchester, Kentucky 40391, or by phone at (859) 745-3100.

Coordinate System: NAD 1983 State Plane Kentucky FIPS 1600 Feet
Datum: North American 1983

Chapter 2: Regional Setting and River Values

This section summarizes the finding and description of the river values that contributed to the river’s designation within the National Wild and Scenic River System. For a complete description of the river values, including regions of comparison, baseline criteria, and baseline and present situation, see the River Values Evaluation for the Red Wild and Scenic River (USDA Forest Service 2021b).

Wild and Scenic River Classification

River segments are classified as wild, scenic, or recreational based on the condition of the river and the adjacent lands as they exist at the time of designation.

- Wild rivers are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive, and waters unpolluted. These represent vestiges of primitive America.
- Scenic rivers are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive, and shorelines largely undeveloped, but accessible in places by roads.
- Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The 9.1-mile Upper Gorge wild river section currently includes 1,096 acres in the Middle Kentucky River Management Area as described in the Daniel Boone National Forest Land and Resource Management Plan (forest plan). A forest plan administrative change proposed for analysis concurrently with this comprehensive river management plan would correct this acreage to include 1,010 acres to match the legal description of the Kentucky Wild River boundary, as required in the Red River Designation Act.

The 10.3-mile Lower Gorge recreational river segment includes 1,440 acres in the Middle Kentucky River Management Area as currently listed in the forest plan. A proposed forest plan administrative change also being analyzed simultaneously with this plan would correct this acreage to include 1,597 acres.

Table 1. Description and Classification of Wild, Scenic, and Recreational River Segments

Designated Segment	Description	Miles	Classification
Upper Gorge	Red River from Highway 746 Bridge to Swift Camp Creek in the Clifty Wilderness.	9.1	Wild River
Lower Gorge	Red River from Swift Camp Creek to the School House Branch.	10.3	Recreational River

River Setting Description

Located in the tri-county area of Menifee, Powell, and Wolfe counties in Kentucky, the Red River runs through the Red River Gorge on the Cumberland District of the Daniel Boone National Forest. The Red River Gorge is located on the western edge of the Cumberland Plateau, where a

dense dissection and cliff formation known as the Pottsville Escarpment hosts the highest concentration of natural arches east of the Mississippi. The Red River crosses this escarpment, meandering through multiple geologic strata with diverse geologic features while flowing freely through a variety of primarily forested habitat.

The wild segment is in the upper reach of the river, starting at the bridge that crosses the river on State Route 746 and terminating at the mouth of Swift Camp Creek, approximately 600 feet upstream from the State Route 715 Bridge. It flows entirely through the Clifty Creek sub-watershed in Menifee and Wolfe Counties. Tributaries to this segment include upper Red River, Stillwater Creek, Big Calaboose Creek, Silvermine Branch, and Clifty Creek. This segment was also designated in 1972 by the state as a Kentucky Wild River. Approximately five miles of the upper reach of the wild segment is outside the forest boundary, while the remaining portion of this segment is within the Clifty Wilderness and the overlapping Red River Gorge Geological Area. Outside the wilderness, beyond the forest boundary, the steep terrain precludes most development. Most of the non-forest section of the corridor is comprised of predominantly forested private land with a few areas of pasture and cropland (USDA Forest Service 2004, p. 3-268). It is free of impoundments, meets water quality requirements, and has an essentially primitive shoreline and immediate environs. No habitations or other signs of development can be seen from this stretch of river. It is completely inaccessible except by trail and can only be accessed easily at two sites, except where an undeveloped trail parallels the river for approximately 2.5 miles in the lower reach of the segment (USDA Forest Service 1988).

The recreational segment is in the Lower Gorge, paralleling Kentucky Highway 715 and 77, part of the Red River Gorge National Scenic Byway, and extending from the mouth of Swift Camp Creek to Schoolhouse Branch. The recreational segment of the Red River originates in the Clifty Creek sub-watershed, briefly flows through the Gladie Creek sub-watershed and ends in the Indian Creek sub-watershed. Tributaries to this segment include Edwards Branch, Chimney Top Creek, Gladie Creek, Sal Branch, Laurel Branch, Compress Creek, and Swift Camp Creek. This segment has some development along the shoreline but remains primarily forested, with some agricultural land, visible dwellings, and commercial subdivisions. The recreational segment contains three bridges, trail segments and trailheads, two canoe-launch sites, pastureland, and the Gladie Historic Site (USDA Forest Service 1988). Three public roads and some private land are also located in this segment. This segment is non-wilderness, located entirely in the Red River Gorge Geological Area (USDA Forest Service 2004).

See the River Values Evaluation for additional description of existing user impacts and resource conditions along the river (USDA Forest Service 2021b).

Free-Flowing Condition

Section 7 of the Wild and Scenic Rivers Act directs federal agencies to protect the free-flowing condition and other values of designated rivers. The term free-flowing is defined in the Act as “existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.” Therefore, it is important to describe both the free-flowing characteristics of the river as well as structures that impact it. The Red River meets the free-flowing condition requirements.

The Red River is a vegetated meandering entrenched channel. In many locations, cross sections typically consist of a high flow floodplain terrace 15-20 vertical feet above a narrower low flow channel. Channel and bank materials are mostly sand, silt, and clay. In some places, an even

higher flood terrace can be observed that corresponds to the 100-year flood elevation. Very little development exists on the floodplain on the valley floor, and practically none on National Forest System lands. Red River Adventure, a private outfitting and guiding company, owns facilities located on private land on the floodplain, but probably does not influence flows along the channel. Flood levels can increase to 20-30 feet above the low flow channel elevation at higher flood levels. Typically, terrace banks are well vegetated with hardwood species with tree roots that knit the banks together with a dense network of roots that maintain the integrity of banks in most places. When trees wash out, banks can become locally unstable, until vegetation can become established again. The low flow channel starts at the base of the terrace slope and is composed of sand and small gravel. The project hydrologist observed few large rocks along the low flow channel, but large rocks were infrequently observed in or along the channel. The low-flow channel typically floods every 1.5 to two years. Floods that inundate the higher floodplain terrace are around the 50-year return interval and typically flood much of the valley floor. Riparian tree species are common throughout the floodplain.

Besides one groundwater and one surface water withdrawal permit in the area, where Campton Water Treatment Plant withdraws water from Swift Camp Creek, no hydropower or other facilities are in the area that would modify streamflow rates (RRWPR 2015). No major diversions are on the Red River, but some small withdrawals for agriculture may exist along the reaches downstream of the Daniel Boone National Forest. There are no official records of withdrawals, but any withdrawal along the wild or recreational segments of the Red River is likely minimal and not expected to significantly reduce flows.

Currently, two highway bridges (KY-77 and KY-715) are the only structures that exist along the wild and scenic river segments, and those structures do very little to influence the free-flowing conditions of the river. At low flows, bridge piers would influence flow no differently than a large boulder, which are prevalent throughout both sections of the Red River; and at very high flows, would possibly constrict flows very rarely and briefly. Because no other structures, such as impoundments (i.e., dams), are in the Red River Wild and Scenic River corridor, nothing regulates flows, particularly during floods. No evidence suggests the free-flowing conditions of the Red River have substantially changed since its designation in 1993. In order to change the natural flow condition, a major project would need to impound, divert, straighten, riprap, or modify the waterway. Highway 715 sits on the ridge adjacent to the river, typically much higher than the river. This likely indicates there was no channelization of the river when Highway 715 was built.

For more information about free flow, including monthly streamflow averages, see the Free Flow section in the River Values Evaluation (USDA Forest Service 2021b).

Water Quality

Wild Segment

The water quality is generally good in the wild segment of the Red River (RRWPR 2015). The entire reach of this segment is designated as one of six types of exceptional use waters - outstanding state resource water (Kentucky Division of Water 2015). The quality of exceptional use waters exceeds that necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water (Kentucky Division of Water 2015). Neither the wild segment of the Red River nor any of its direct tributaries are listed as impaired. However, an impaired stream,

Swift Camp Creek, flows into the Red River at the boundary between the wild and recreational sections.

Clifty Creek and Big Calaboose Creek fully support warm-water aquatic habitat but have insufficient data to assess other uses. Karst topography can be found at the boundary between the wild and recreational segments of the Red River. Karst topography can cause gaining and losing streams on the Daniel Boone National Forest (Cherry 2019). Gaining and losing streams can pose a threat to water supply, as they can be direct conduits of pollution to groundwater.

Recreational Segment

The water quality in the Red River recreational segment is worse than in the wild segment. Swift Camp Creek, an impaired stream, flows into the Red River at the border between the wild and recreational sections. The headwaters of Swift Camp Creek are impaired from *Escherichia coli* (*E. coli*) and sediment, and Swift Camp Creek mainstem is impaired from *E. coli*. Red River mainstem and Wolfpen Creek are special use waters - outstanding state resource water. Chimney Top Creek, Swift Camp Creek, and Gladie Creek are special use waters - cold water aquatic habit.

Wolfe County officials estimate that there are approximately 35 failing septic systems or direct discharges in the Swift Camp Creek area (personal communication with Wolfe County Health Department in RRWPR, 2015). This is likely a major factor for why Swift Camp Creek is impaired for *E. coli*. A citizen-science water sample for *E. coli* was collected from Swift Camp Creek on August 1, 2020, showing levels well above acceptable thresholds defined by the EPA. Because *E. coli* levels can fluctuate greatly, it is not possible to draw conclusions about management practices from a single sample. However, in 2020, the Kentucky Division of Water reassessed the impaired reach of Swift Camp Creek (from Rockbridge to the headwaters), confirming that the reach is impaired from *E. coli* (Kentucky Department of Water 2020). Even though the Daniel Boone National Forest has been working to remediate the sources of *E. coli* in Swift Camp Creek on Forest Service ownership, the 2020 assessment indicates more work is needed to reduce *E. coli* levels in Swift Camp Creek, including attention to failing septic tanks upstream of Forest Service ownership

The Red River Gorge Restoration and Watershed Plan Project included in-depth monitoring of portions of the Red River recreational segment between 2011 and 2012. Indian Creek was also sampled, downstream of the Red River recreational segment. These efforts established a critical framework for understanding the water quality in this segment. All the results are available in the Red River Gorge Restoration and Watershed Plan Project (RRWPR 2015) and are summarized in the River Values Evaluation (USDA Forest Service 2021b).

The samples collected for the Red River Gorge Restoration and Watershed Plan Project, from 2011 to 2012, established baseline water-quality conditions for the Red River recreational segment and helped identify areas of concern. Since then, a Clean Water Act 319(h)-funded project in the Red River Gorge has worked to improve conditions, completing projects to reduce sources of contaminants, especially along Swift Camp Creek.

Outstandingly Remarkable Values

Scenery, recreation, geology, fisheries, history/archaeology, and botany are outstandingly remarkable values for both the wild and recreational segments of the Red River. These values are described below.

Although some terrestrial wildlife species are federally listed, sensitive species, or conservation species, similar habitat is present throughout the Western Allegheny Plateau ecoregion within the state of Kentucky in which these species are just as likely to occur. Although suitable habitat is present for several terrestrial wildlife proposed, endangered, threatened and Regional Forester sensitive species found in the Red Wild and Scenic River corridor, these species do not contribute substantially to the function of the Red River, nor do they owe their location or existence to the presence of the river. These species can be found in similar river corridors across the landscape. As a result, wildlife does not constitute an outstandingly remarkable value of the Red Wild and Scenic River.

Scenery

Scenery along the Red River corridor, within the Red River Gorge, is exemplary within the region of comparison. The following attributes meld together to create attractive and distinctive scenery:

- The concentration of unique geologic features;
- The rich composition of plant communities; and
- The distinct water characteristics.

The Gorge instills a sense of enclosure within a rich, intact natural area. Natural sounds are pleasing to the ear. Birdsong and insect noises constantly change throughout the day and night. Night skies are dark with little light pollution. Vegetation has mostly recovered from human modifications and appears intact with little fragmentation except in areas of very high public use.

Erratic erosion along the Pottsville Escarpment has created a high diversity of distinct geologic features such as alcoves, rock houses, natural arches, spires, palisades, pillars, boulders, precipitous cliffs, and promontories (USDA 1984, p. A-5). This in turn has created diverse soil types, moisture conditions, plant communities, spatial dimensions (Braun 1950, p.97), and sun and shade contrasts (Berry 1991, p. 75). Soils on ridges and along the river are derived from sandstone, making them sandy and well drained. Soils on the side slopes and in the more sheltered landscape positions are deep well-drained silt loams derived from shale and sandstone. Shale deposits add to the patterns of terrain weathering. Bold bands of exposed sandstone are prominent focal points in the upper elevations of the cliffs (Braun 2001, p. 97). Huge boulders have cleaved off from the canyon walls and become popular destination points along the river.

Along the river and its tributaries, floodplains harbor rich bottomland forest. Pockets of limestone outcrops add to a diverse mosaic of riparian vegetation. Picturesque plant assemblages adorn the tops of large boulders in the river that rise above the scour of the flood stage (Berry 1991, p. 58). Slope forest grows beneath sandstone cliffs that tower 500 to 600 feet above the river valley (Braun 2001, p. 100). On the surface of the flat-topped plateau, dry pine and oak forest contrast with moister forest within the Gorge. Coniferous trees complement deciduous forest with year-around green. Pine trees cap the rims of the winding cliff lines (Braun 2001, p. 100). Coves and recesses along the escarpment shelter dark pockets of hemlocks. Evergreen, glossy leaves of rhododendron, and kalmia grow in the shrub layer, sometimes limiting views.

Seasonal changes create a suite of distinct settings. In spring, deciduous forest emerges with bright green leaves and carpets of ephemeral wildflowers beneath. Summer brings humidity and a lush, full-bodied, contiguous tree canopy. Rock features and meadows of asters, goldenrods and grasses add variety to the matrix of green. Leaves, such as those of bigleaf magnolia, filter

sunlight for a soft lighting inside deciduous forest. Fall colors are picturesque with oranges, bronzes, yellows, greens and reds. In winter, leafless trees reveal a tangle of interesting woody branching structures and allow for more sun exposure.

Within the Red River Gorge, water takes on numerous forms and characteristics. Where tributaries have eaten away at the plateau escarpment, spectacular spindly waterfalls drop long distances into crystalline plunge pools. The main stem of the Red River's flow is robust and fluctuates between flood stage and base flow. In times of flood, the river is swollen, turbid, noisy, and palpable (Berry 1991, p. 7). Low flow is sluggish, revealing boulders and beaches - shallows become clear, and deeper pools murky green.

The attributes of the scenery outstandingly remarkable value occur throughout the wild and recreation sections. However, the scenic character differs between the two sections. In the wild section, the river's floodplain is more constrained. The river and its tributaries are actively incising a cleft in the upland plateau. This has created a variety of spatial dimensions between the canyon walls (Berry 1991, p. 54). Reaches of the wild section contain jumbled piles of large sandstone boulders. Wendell Berry describes one particular reach as the Roughs of the Red where impressive boulders impede overland travel and make river navigation treacherous (Berry 1991, p. 56). The wild section's river gradient is high and displays whitewater in rapids and translucent water in straight runs. Overall, the wild section has less suspended sediment than the muddier recreation section. It is also shallower with more riffles and rapids. Named geologic features visible in this section are Red Byrd Arch, Eagle Peak, and Moonshiners Arch.

The dimensions of the recreation section open within a broader floodplain with deeper views towards the enclosing cliffs. The river's banks are steeper and muddier. Here, the river has incised deeper into its floodplain. Foliage of bankside plants shade the river. In the recreation section, erosive forces appear to have had more time to shape the landscape, and the plant communities' have had more time to develop. Prominent landmarks are visible, such as Sky Bridge Arch, Hens Nest Rock, Jewell Rock, Raven Rock, Auxier Ridge, Chimney Top Rock, Courthouse Rock, Tower Rock, Cloud Splitter, and Jump Rock. As the river takes a sinuous path through the valley, spaces between river and cliffs contract and expand. Views vary in duration as terrain hides, reveals, and frames scenes. The gradient of the river in the recreation section is low. The flow is deeper and slower with more flow volume than the wild section.

Recreation

Recreation is an outstandingly remarkable value along the wild and recreational segments of the Red River. The Red River attracts visitors from across Kentucky, the United States, and internationally to partake in canoeing, kayaking, hiking, sightseeing, photography, camping, rock climbing, and rappelling. Recreation use occurs year-round, although type and intensity vary per season, with the highest use occurring from March through November.

Two launches, Big Branch and Copperas Creek, and the Osborne Bend Trailhead access the wild segment of the river. Copperas Creek Canoe Launch also provides boater access in the recreational section of the river. Rugged shorelines, large boulders, and inaccessible Wilderness provide canoeists and kayakers with one of the most challenging stretches of whitewater in the southeast. This technical river run varies from class III during winter and spring run-offs to class I during the low water flows of summer. Visitors also access trails, camping areas, arches, caves, waterfalls, and scenic overlooks along the river corridor. The towering sandstone cliff lines that

buttress the wild segment of the Red River are known as some of the world's premier rock-climbing areas, attracting rock climbers from across the globe.

The recreational section of the river sees moderate to heavy canoe and kayak use during spring and early summer. Use level is often dictated by river level and flow, as this fluctuates and is often inadequate for paddling mid-summer through fall. The recreational segment is primarily flat water with small riffles and some class I rapids, making it a popular option for beginning paddlers. Canoeists and kayakers access the river at Copperas Creek Canoe Launch using personal watercraft or an outfitter/guide. Hiking, sightseeing, and camping opportunities are abundant within the recreational segment. Multiple trails within the corridor, including the Sheltoewe Trace National Recreation Trail, access the river, campsites, arches, and geological features where the river adds to the scenic backdrop from ridgetop overlooks. During the hot summer months, the river serves as a cooling spot as many visitors congregate to swim, especially at a deep pool adjacent to a large sandstone bolder named "Jump Rock". The soaring sandstone cliffs formed by the slow and steady carving of the Red River offer outstanding rock-climbing opportunities. Similar to the wild segment, miles of cliff line within the recreational corridor attract rock climbers from around the world with premier rock-climbing opportunities.

Geology

Geology is an outstandingly remarkable value in the wild and recreational segments of the Red River corridor. The wild segment is remarkable for large boulders along the shore and in the river that have created class III rapids. Within the recreational section, the geologic features reach their greatest density and development, and large boulders add scenic value for river users.

Much of the wild and scenic river corridor is located within the Red River Gorge Geological Area. The area contains unique and rugged topography full of natural arches, pinnacles, and prominent cliffs among other geologic formations. Most ridges harbor clifflines with rock shelters at their base. Perhaps the most striking feature is the sandstone arches carved out by years of wind and water erosion. The most popular arch is Sky Bridge, a graceful arch over 70 feet long and 23 feet tall. Another is Princess arch, over 30 feet long and eight feet tall. With over 100 known arches, the Red River Gorge Geological Area contains the largest concentration of arches east of the Rocky Mountains.

Fisheries

The Red River designated segments collectively possess an outstandingly remarkable value based on the river's ability to support high native aquatic biodiversity and provide habitat for recreational fisheries and at-risk aquatic species. A total of 70 native fish species and 16 mussel species have been detected or are believed to occur in the river segments. In general, fish species biodiversity in the river segments is at or above the average species diversity values reported for entire sub-watersheds within the southeastern United States (Elkins et al. 2016). Extensive research has demonstrated that the southeast has the highest biodiversity of freshwater fishes and levels of rarity or imperilment within North America (Sheldon 1988; Warren and Burr 1994; Warren et al. 2000; Jelks et al. 2008). Therefore, the designated river segments have outstandingly remarkable value relative to their fish biodiversity on at least the national scale.

Habitat in the wild segment is considered to be good or great based on high Kentucky Index of Biotic Integrity (KIBI) scores coupled with high biodiversity. In general, habitat in the wild segment consists of cooler water, higher gradients, and coarser substrates compared to the

recreation segment. These differences in habitat along the designated river segments contributes to habitat diversity which likely supports high biodiversity. Two ESA listed fish species can be found within the Red River planning area: the Kentucky arrow darter and the snuffbox mussel. The designated river segments provide habitat for at least three aquatic species of management concern, which include the northern brook lamprey, eastern sand darter, and elktoe mussel. Both the northern brook lamprey and elktoe mussel are listed as threatened by the state of Kentucky. Although not a listed species, the eastern sand darter has almost vanished in much of Kentucky because of stream channelization, dam construction, and siltation (Grandmaison et al. 2004). This species requires clean sand in moderate to large rivers (Daniels 1993; O'Brien and Facey 2008). While the species can no longer be found in many of its former habitats, it is still present in the Red River. The river segments also provide habitat that supports wild fish stocks used in recreational fisheries. These wild fish stocks include rock bass, sunfish, catfish, smallmouth bass, and muskellunge. The river is one of the few free-flowing muskellunge streams in Kentucky. Most of the muskellunge fishery occurs in the recreational segment given the presence of suitable habitat. Therefore, the Red River designated segments have outstandingly remarkable value relative to their habitat on the regional scale.

History and Archaeology

Historical and archaeological resources in the Red Wild and Scenic River boundary meet the evaluation criteria for an outstandingly remarkable value along both the wild and recreational segments. As described above, many sites have unique and rare characteristics, with both regional and national importance. The wild and scenic river area and the surrounding Red River Gorge area has been occupied for over 10,000 years, often by multiple cultural groups and for sacred purposes. At least 20 sites within the corridor are contributing elements to the National Register of Historic Places, and the corridor is only 17.8 percent surveyed.

The uniqueness of the Red River Gorge Geological Area and its river corridor is not only a draw for present day recreation, but it has also drawn the interest of Native Americans for over 10,000 years, and Euro-Americans for the last 200 years (USDA Forest Service 2021b). The dry microclimate of the rock shelters has preserved, to this day, woven fiber slippers, fiber bags filled with cultivated and foraged products, and wooden tools, as well as the remains of cultivated and uncultivated plants. Preservation of these artifacts has produced an important and unique insight into the culture of ancient Native Americans. Wyss and Wyss (1977) state, "The prehistoric archaeological sites of the Red River Gorge area are well known for excellent preservation of normally perishable ethno-botanic remains, the bulk of which have been recovered from sites of the Woodland Tradition. The remains of about 50 species are present in these collections."

Further, the numerous petroglyphs in the Red River Gorge Geological Area are an important addition to the artifacts mentioned above. The Red River Gorge Geological Area reportedly has the highest concentrations of petroglyphs east of the Rocky Mountains (Coy et al. 1997; Ison 2004).

In addition to unique archaeological features, the Gorge (including the area within the wild and scenic river boundary) also contains significant historic resources. These include standing structures, architectural and landscape features. The significance of these features is embellished by recorded descriptions of the area. The earliest intact historic resources are wooden remnants of 19th century niter (saltpeter) mining, which supplied a component of gunpowder to early Euro-American settlers of Kentucky and to the early American military effort during the War of 1812. In the late 19th and early 20th century, the Gorge was a hotspot of logging. The Nada tunnel, the

western portal for the Red River Gorge Geological Area, is a narrow tunnel dug out of the rock originally for a narrow-gage rail line to haul logs out of the area. The Gladie Cabin site, over a century old, was built during the era of this early logging industry and still stands. Finally, the Sleepy Hollow Lodge is another standing cabin along the Red River. Built in 1939 by a couple who enjoyed visiting the area, this cabin represents the earliest period of Euro-American recreational use of the Red River Gorge area.

Botany

Botanical resources are an outstandingly remarkable value for the Red River corridor. The outstandingly remarkable value is related not to any one species, but rather the combination and stratification of species within the corridor. While the local endemic species, white-haired goldenrod, is present in both segments, the bulk of its distribution is outside the corridor. No outstandingly remarkable value is specifically related to that species. The diversity of vegetation, both canopy trees and understory species including herbaceous plants in the corridor is exceptional. Species range from mesic yellow buckeye, sugar maple, American basswood and eastern hemlock to xeric pitch pine, scarlet oak, chestnut oak, and downy serviceberry. All are on display on the face of the river gorge. Less visible but still present are the shrubs and herbaceous plants. Shrubs range from spicebush, bladdernut, and leatherwood at lower elevation to buffalo nut, lowbush blueberry and pinxter flower azalea on dry to xeric sites. Herbaceous species range from the typical spring wildflower suite of mesic forest including trilliums, hepatica, blue cohosh, and seersucker sedge to dwarf iris, yellow-eyed grass, and hastate violet of upland forest. Summer flowers include poke milkweed, Canada lily, and a variety of asters and sunflowers. The flora in the corridor is relatively intact, especially in the federal ownership portion of the wild segment where access is somewhat more difficult, and provides a good example of dry to mesic, sandstone to limestone, shaded to exposed, and spring to fall variation. Mixed in are several state rare and regionally rare species. The species that occupy specialized habitats of river bars, cliffs, and rockhouses provide additional diversity in the corridor.

The recreational segment has somewhat more diverse flora than the wild segment as more discrete habitat types are available in that segment. This diversity is the outstandingly remarkable value. The wild segment, however, has a more intact flora, and the outstandingly remarkable value for this segment is bolstered by this.

Chapter 3: Land Uses and Infrastructure

This section presents information known about the current uses along each river, including private lands.

Land Ownership within River Corridor

Table 2 and figure 3 below depict acres of land ownership within the river corridor.

Table 2. Land Ownership within Wild and Scenic River Corridor

Land Ownership	Recreation Segment	Wild Segment
National Forest System	1,475 acres	704 acres
Private	122 acres	221 acres
Other	None	85 acres (State: Office of Kentucky Nature Preserves)
Total Acres	1,597 acres	1,010 acres

The following is a discussion of private land from the 2004 Forest Plan Environmental Impact Statement:

Private Land Use: Except for the five-mile long river segment east of the DBNF proclamation boundary, most of the private land (555 acres) within the 2,678-acre Red River Wild and Scenic corridor is on the recreational segment of the river. The majority of the private land in the corridor is steep, forested land that cannot be developed. The developable land consists of small tracts, which contain private residences or are not developed, except for clearing of trees to create small (<10 acres) grassy openings or pastures. Even though no county zoning regulations exist, there are few negative impacts from these lands on the corridor within the proclamation boundary. An emphasis on land acquisition in the RRGGA has allowed the Forest Service to acquire much of the private land in the RRGGA. Since 1986, a total of 6,795 acres has been acquired from willing sellers. Several private tracts within the river corridor were acquired as part of this program.

There are also eight miles of public roads that parallel the recreational segment of the river. While the land in the state road right of way [is national forest], the state is responsible for maintenance of the [highway and] right of way². Recently, nomination by the Commonwealth of Kentucky was successful in having state roads within the corridor designated as part of the National Scenic Byway system.³

The five-mile long segment of the corridor that is outside of the forest proclamation boundary is primarily private land in small farms. Almost all of the land immediately adjacent to the river, which makes up the majority of this section of the corridor, is forested, steep, and undeveloped. Above the steep sides of the river, the corridor is mostly forested with some small areas of pastureland.

² The boundaries of the right of way are not documented, but the state claims the top of the cut slope to the bottom of the fill slope as their right of way.

³ No plan has been developed as of the writing of this Comprehensive River Management Plan for the National Scenic Byway referenced above.

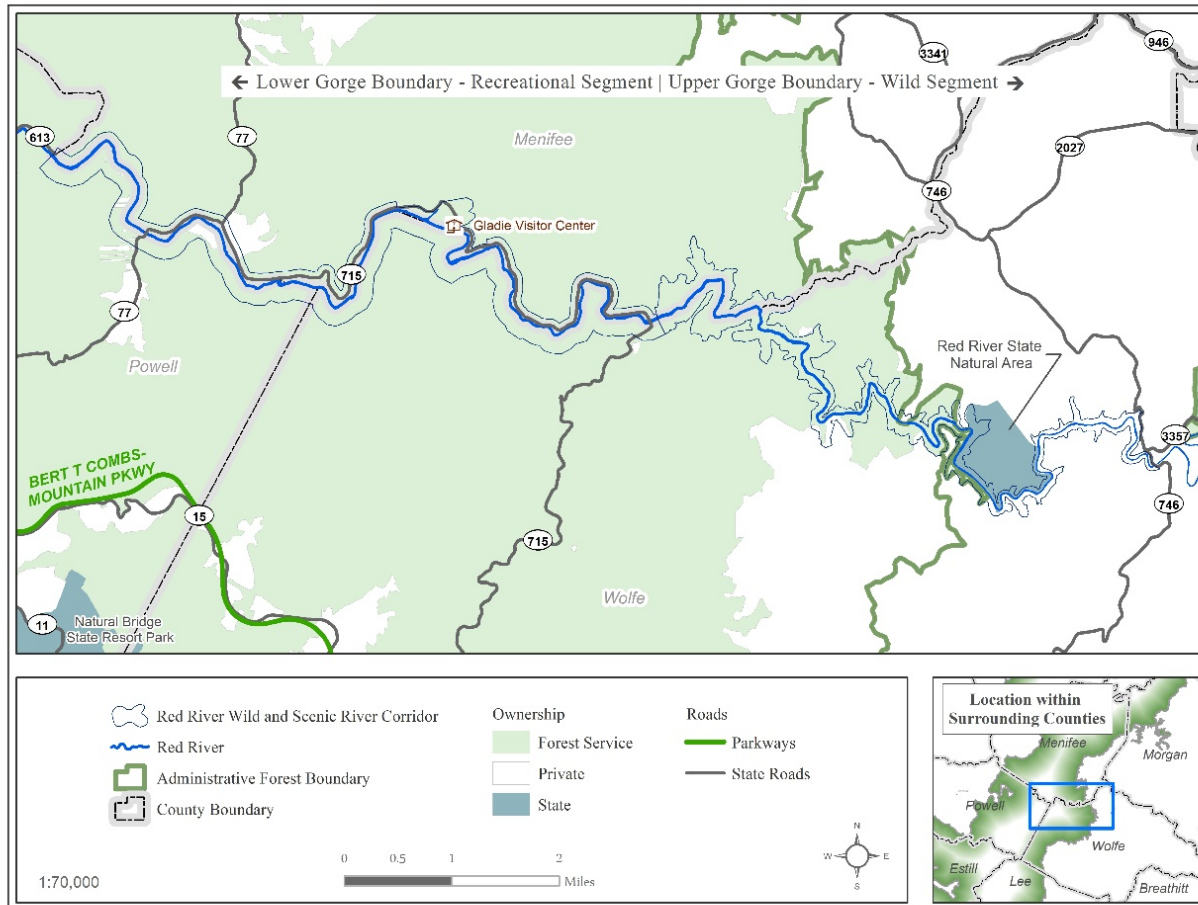


Figure 2. Land Ownership Within and Adjacent to the Red Wild and Scenic River Corridor

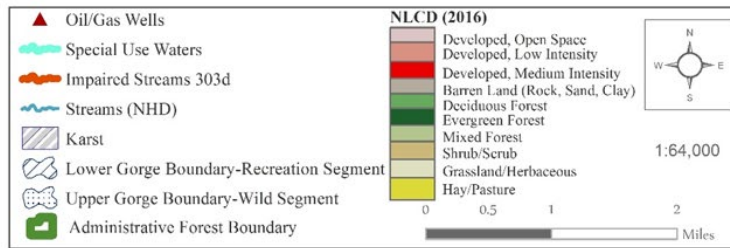
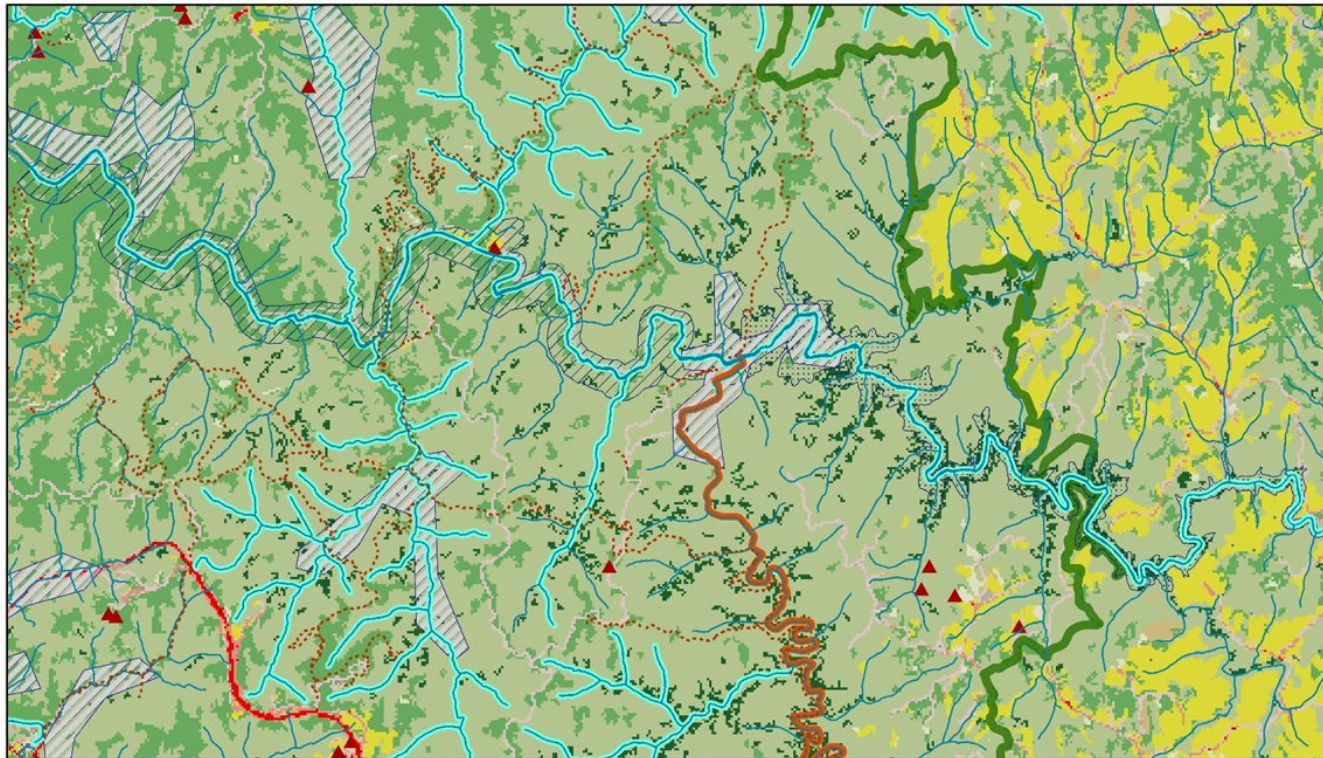
The Red River Adventure company owns and operates John Swift's campground on nearby private land and operates as an outfitter and guiding company within the Red River Corridor under a special use permit. At another private inholding near Gladie, known as Pumpkin Bottom, the owners are building cabins. Additional private tracts exist along the Red River corridor, but we are not aware of any additional development planned at this time.

This comprehensive river management plan implies no jurisdiction over private land or private rights in the river corridor, outside the bed and banks of the designated river. While the forest plan lists goals to acquire private lands and mineral rights from willing sellers within the river corridor (3.C.1-Objective 1.A and 3.C.3-Objective 1.A), this plan does not include authority to manage or acquire private land except from willing sellers.

Other Land Use

The dominant land use directly adjacent to the Red River is mixed and evergreen forests. At the upstream reaches of the Red River wild section, hay and pastureland become more prevalent as land ownership changes to private. Developed land can be found in the area and what little is found usually lies adjacent to a road. The land use along the recreational segment is similar to the wild segment, but with more forest and less developed land, primarily because less private land surrounds the recreational segment. The developed land around the headwaters of Swift Camp Creek and the city of Campton is likely a major source of *E. coli*. A few oil and gas wells can be found in the Clifty Creek sub-watershed and the vicinity of the recreational segment (figure 3).

Additional uses along the river include downstream water consumption, powerline access and infrastructure, outfitter and guide special use permittees, and public recreation access. Public recreation access is available via a system of roads and trails open to the public as displayed on the Daniel Boone National Forest Cumberland Ranger District Motor Vehicle Use Map (MVUM). Water quality and downstream water use is also discussed in the Powell's Valley Water District 2017 Water Quality Report. Clark Energy has a powerline under a special use permit along the recreational segment of the Red Wild and Scenic River. Administrative uses also occur occasionally in the river corridor, including forest personnel conducting field work, law enforcement patrols, and partner and volunteer groups engaged in restoration activities.



Disclaimer
 The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, irregularly when being created or revised, etc. Using GIS products for other than those for which they were created, yield no guarantee or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information contact:
 Daniel Dwyer National Forest
 1700 Hygans Road, Winchester, Kentucky 40391
 (859) 745-3100
 Coordinate System: NAD 1983 State Plane Kentucky FIPS 1600 Feet Datum: North American 1983

Map Created By: epickett Date: 11/6/2020 Path: T:\FS\NFS\DanielBoone\Project\CMB\NEPA\RedRiver_CRMP_2020\GIS\MXD\RedRiverCRMP_WSboundary_HydroOilGasMap_8x11_Landscape.mxd

Figure 3. Red Wild and Scenic River with Streams, Karst, Land Use, and Oil and Gas Wells

Activities and Infrastructure

Lands and Special Uses

Outfitter-Guides: As of 2019, six outfitter-guides were permitted in the river corridor, offering a variety of experiences including backpacking and water sports. A total of 4,000 service days were authorized in 2019, although not all days were used. The trend in service days from 2017-2019 was relatively stable, with no large increases or decreases. Most commercial services were for day use outfitting (canoe rentals) and not guided use on the river. The Red River Adventure outfitter and guiding company manages river trips including outfitting and guiding canoe and kayak river trips along the Red Wild and Scenic River, typically launching at Copperas boat launch and taking out on their private land within the corridor. In 2020, we received five new applications for outfitter-guide permits along the river corridor. This trend is expected to continue, with increasing demand for commercial services including commercial guiding permits. It is likely that a needs assessment will be required to issue future permits and to determine the appropriate level of commercial outfitter and guiding use along the wild and scenic river corridor and in the surrounding Gorge.

Commercial use is not specifically addressed in the [Visitor Capacity](#) Analysis (USDA Forest Service 2021c). The overall capacity of the land-based sites in the river corridor was analyzed in the capacity analysis to protect and enhance the river values. The capacity analysis will inform a future needs assessment for commercial use on the Red River. Once a needs assessment is completed, forest staff will determine if there is additional future outfitting and guiding opportunity. If additional opportunities exist, a letter of solicitation for commercial interests will be issued. If more than one outfitter or guide responds with interest for each opportunity, a prospectus will be developed.

Mineral Rights: Most of the older tracts of land (purchased in 1930's) have term reserved mineral rights that have expired. Newer tracts (purchased 1960 and later) have a mixture of outstanding rights and federal minerals.

Transportation Infrastructure

Bridges: Two highway bridges cross the recreational segment of the Red River (KY-77 and KY-715). These two highway bridges along with the Red River Suspension Bridge, a footbridge where Sheltolee Trace trail crosses the Red River, are the only structures that exist along the recreational segment of the river. The KY-746 bridge also traverses the Red River, marking the beginning of the wild segment of the river corridor.

Easements and Right-of-Way: State highways through the forest including KY-715 and KY-77 along the river corridor are under a mixture of easement deeds which are managed by the state but owned by the federal government, and fee simple deeds which are owned and operated by Kentucky Transportation Cabinet. Kentucky Transportation Cabinet (KYTC) is responsible for maintenance of the state highways and associated rights-of-way within the river corridor, including the approximately 46-mile segment through the Gorge designated as a National Scenic Byway. KYTC fee simple owns the land within 30 feet of the centerline on either side of the road, as well as cut and fill beyond the 30-foot zone. Right-of-way width also varies from tract to tract.

Parking: Parking is currently available for 252 vehicles along the river corridor, with 42 parking spaces available along the wild segment and 210 along the recreational segment.

Roads: Less than 11 miles of narrow, winding roads are within the recreational segment of the river corridor. The main route through the Gorge that extends for approximately seven miles within the corridor is KY-715 (Red River Gorge Scenic Byway). KY-715 is a paved state highway that is owned and maintained by the Kentucky Transportation Cabinet (KYTC). KY-77, known as Nada Tunnel Road, also owned and maintained by KYTC, traverses the Gorge from Nada, Kentucky to Mariba, Kentucky. Road 613, called North Fork Road, enters the corridor for a short distance and is managed by both Powell and Menifee Counties. Additional roads that cross into the corridor boundary include National Forest System Road (NFSR) 2017 (Edwards Branch Road), NFSR 2126 (Chester’s Road), NFSR 23, NFSR 245 (Sky Bridge), NFSR 2055 (Boat Ramp Road), and county road POW-2070 (Raven Rock). KY-746 is a state highway that extends along the boundary of the wild segment of the corridor.

Utilities:

- **Powerlines:** Clark Energy’s overhead powerlines run from road 613 to the Gladie Visitor Center.
- **Pipelines:** There are no known pipelines in the corridor. Water is supplied to the Gladie Visitor Center via a spring fed water system.
- **Telephone lines:** AT&T telephone lines run from the Nada tunnel to the Gladie Visitor Center.
- **Fiber optic lines:** We are working with Mountain Rural Telephone to install fiber optic line(s) to the Gladie Visitor Center in the future. The proposed route is from Tarr Ridge down to the river corridor, then along KY-715 to the Gladie Visitor Center.

Recreation and Visitor Amenities

Boat Launches: Two boat launches, Big Branch and Copperas Creek, access the wild segment of the river. Copperas Creek Canoe Launch also provides boater access in the recreational segment.

Restrooms: Three vault toilet restroom facilities are located within the river corridor. One restroom is located at Osborne Bend Trailhead, one at Bison Way Trailhead, and one at Gladie Cabin. In addition, a single portable chemical toilet is located at the Sheltowee Connector Trailhead parking area.

Trails: Table 3 lists the seven system trails that provide access along the wild and scenic river corridor, approximately 2.5 miles⁴ of which are within the corridor boundary.

Table 3. National Forest System Trails within Wild and Scenic River Corridor

Trail	Length	Notes
Chimney Top	0.004 miles	Small sliver falls within the boundary
Osborne Bend Loop	0.5 miles	A small segment is within both the recreational and wild sections

⁴ The GIS specialist completed a GIS exercise to identify miles of trails within the corridor. Trails extend beyond the corridor and numbers only reflect segments within the boundary.

Trail	Length	Notes
Princess Arch	0.004 miles	Small sliver falls within the boundary
Sheltowee Connector	0.4 miles	
Sheltowee Trace	0.9 miles	
Sky Bridge	0.5 miles	
Tower Rock	0.1 miles	

Visitor Center: The Gladie Visitor Center, a hub for visitor education and information including maps and camping permits, is located within the recreational segment of the corridor. Gladie Visitor Center also hosts special events and houses a theater and exhibits that provide information including films about the nature and history of the Gorge.

Management Activities

Ongoing management activities that protect and enhance river values include infrequent treatment of invasive species along the road corridor and in the river floodplain and routine operations and maintenance activities to keep roads, trails, and other facilities maintained to standard.

Vegetative management activities along the corridor follow the Cumberland District Open Lands Management Plan (USDA Forest Service 2019). The ongoing vegetative management activities include the following:

- Cane restoration.
- Collection of downed trees for use as firewood.
- Non-native invasive species treatment.

Additional activities and uses are described above in the [Recreation](#) section.

Chapter 4: Tribal and Agency Coordination

Tribal Governments

Like the rest of North America, the Red River runs through lands that are considered ancestral by several federally recognized Tribes. The unusual landscape of the Red River Gorge has preserved ancient materials in a rare and unique way and contains a high density of archaeological sites. Tribes have oral traditions that place them on the landscapes in the Ohio river valley since time immemorial. Based on evidence from archaeological excavations, we know that people lived in and considered the Gorge their home as many as 10,000 years ago. It's important to the USDA Forest Service to seek the views of people who consider the forest their home. The Daniel Boone National Forest regularly consults with the three federally recognized Shawnee and three federally recognized Cherokee tribes to seek their views on proposed protects and potential impacts.

Federal Agencies

The Daniel Boone National Forest manages the National Forest System lands within the Red Wild and Scenic River corridor. The Forest Service is the agency charged with administering the Red Wild and Scenic River. As such, the Forest Service provides the determination of effects to free flow, water quality, and outstandingly remarkable values for any water resources projects as described in Section 7 of the Wild and Scenic Rivers Act where the designated segments cross National Forest System lands.

The Environmental Protection Agency develops and enforces regulations that implement environmental laws enacted by Congress, including those associated with the Federal Water Pollution Control Act, commonly called the Clean Water Act. The Environmental Protection Agency has the authority to implement pollution control programs. The Clean Water Act governs the discharge of dredged or fill material into “waters of the United States.” The Environmental Protection Agency is the lead for establishing the environmental guidelines and criteria that must be met to receive a permit under Clean Water Act.

The U.S. Army Corps of Engineers regulates, through permits, the discharge of dredged or fill material into rivers and wetlands of the United States. The Corps also regulates structures and work in navigable waters. U.S. Army Corps permit applications for activities in wild and scenic rivers that are subject to the provisions of Section 7 of the Wild and Scenic Rivers Act.

The Forest Service shares management responsibilities with the U.S. Fish and Wildlife Service for protecting Endangered Species Act-listed species and their associated habitat.

State and Local Agencies

The Red River is also designated by the Commonwealth of Kentucky (1980) as a State Wild River, under the Kentucky Wild Rivers program, administered by the Office of Kentucky Nature Preserves. Some activities are strictly prohibited within a State Wild River corridor, such as surface mining, clear-cutting of timber, and construction of dams or other in-stream disturbances. Existing residential and agricultural uses continue, but developments that might impair the river's water quality or natural condition are regulated through a permit system.

The Kentucky State Historic Preservation Office (SHPO) is a state office with a federal mandate. Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations at 36 CFR 800, federal agencies are required to consult with the State Historic Preservation Office regarding the eligibility of historic and cultural properties for nomination to the National Register of Historic Places, and on determinations of effect from federal undertakings and management decisions.

The Kentucky Division of Water enforces state water quality standards under the Clean Water Act. The U.S. Forest Service works closely with the Kentucky Division of Water and Kentucky Department of Fish and Wildlife on programs and projects designed to enhance the water quality, recreation, and ecological health of the Red River. The Division of Water has provided grant funding to support a variety of programs and projects, including funding that has helped a non-profit organization, the Kentucky Waterways Alliance, form a local watershed protection coalition, the Red River Watershed Group. The Red River Watershed Group is very active in helping private landowners reduce their impacts to the river and recruiting volunteers who perform work to enhance the river across the national forest and on private lands.

Kentucky Transportation Cabinet (KYTC) administers the National Scenic Byway and state highways in the corridor. Both Powell and Menifee Counties have management responsibilities for their respective sections of road 613, a road located parallel to the last 1.5 miles of the recreational segment of the river. The counties perform routine maintenance and make repairs.

Wolfe County and Powell County have very active tourism boards, supported by local restaurant and hotel taxes, and Menifee County has a designated tourism official. All three counties, through their tourism efforts, help promote visitation to the Red River. Powell County Tourism manages a visitor center in the community of Slade and promotes the Red River through many publications they produce (in cooperation with the business community and other tourism offices), advertising, and by providing visitor information in person.

Chapter 5: Planning Context

Relevant Law, Regulation, and Policy

Wild and Scenic Rivers Act

Enacted in 1968, the [Wild and Scenic Rivers Act](#) (16 U.S.C. 1271-1278) preserves selected rivers and their immediate environments in free-flowing conditions in order to protect them for the benefit and enjoyment of present and future generations. The Act requires river-administering agencies and other federal agencies to protect and enhance the values for which the river was designated. The Wild and Scenic Rivers Act requires the administering agency to establish a detailed river corridor boundary of an average of not more than 320 acres per river mile and to prepare a comprehensive river management plan for those areas. The relevant sections of the Wild and Scenic Rivers Act are described throughout this management plan and provide the overarching planning context. A section 7 analysis under the Wild and Scenic Rivers Act is required for any additional future development in the bed or banks of the river within the wild and scenic river corridor.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 established procedures for decision making, disclosure of effects, and public involvement for federal actions. Forest Service Manual 1950.2 requires consideration of the impacts of Forest Service proposed actions on the physical, biological, social, and economic aspects of the human environment (40 CFR § 1508.14).

To meet requirements under NEPA, we are completing an environmental assessment for this comprehensive river management plan along with proposed site-specific and adaptive management actions to help address known impacts to river values to protect and enhance those values. Additional future management actions will require additional development of a proposed action and future environmental analysis under NEPA, where applicable. All proposed projects in the corridor would be checked for consistency with this plan during the future analysis.

The Wilderness Act of 1964

The Wilderness Act guides management of congressionally designated wilderness areas. The designated Clifty Wilderness area is partially located within the Red Wild and Scenic River corridor. The Wild and Scenic Rivers Act includes language specific for situations where wilderness and wild and scenic river designations overlap. It states: “Any portion of a component

of the National Wild and Scenic Rivers System that is within the national wilderness preservation system... shall be subject to the provisions of both the Wilderness Act and this [WSRA] chapter with respect to preservation of such river and its immediate environment, and in case of conflict between the provisions of the Wilderness Act and this chapter, the more restrictive provisions shall apply” (16 U.S.C. § 1281(b)).

Agency Policy

Forest Service Manual 2350 provides additional information on the requirements for completing a comprehensive river management plan. Additional guidance on the suggested contents of a comprehensive river management plan is found in the “Wild and Scenic River Management Responsibilities,” a technical report of the Interagency Wild and Scenic Rivers Coordinating Council (2002). The suggested contents include a description of the river setting and resource values, planning context, coordination with others, management direction, management actions, and monitoring strategies.

It is the Forest Service’s responsibility to implement Federal and Forest Service policies (Executive Order 13175, 13007, NHPA, and FSM 1563) regarding relations with federally recognized Indian Tribes. The policies and regulations spell out a government-to-government consultation practice, so that Forest Service activities can be carried out with sensitivity toward places of special importance to tribes.

Forest Plan Direction

The river designation predates the [Daniel Boone National Forest Land and Resource Management Plan](#) (forest plan) of 2004. The forest plan contains forestwide management direction as well as management guidance for specific geographic and management areas including the Red Wild and Scenic River corridor. Management direction includes goals, objectives, standards, and guidelines for the Red River’s river values and other resources and uses occurring in the area. This management applies to all future projects and activities within the Red Wild and Scenic River corridor. Where management areas overlap, such as the Clifty Wilderness and the wild segment of the Red River, the more restrictive direction applies. The forest plan also provides desired future conditions, objectives, goals, standards, and guidelines for the following prescription areas that are included in or overlap with the river corridor:

- Forestwide Recreation Management (pp 2-21 through 2-22)
- Riparian Corridors (pp 3-10 through 3-16)
- Clifty Wilderness (pp 3-39 through 3-42)
- Developed Recreation Areas (pp 3-47 through 3-49)
- Red River Gorge Geological Area (pp 3-67 through 3-69)
- Scenic Integrity Objectives (Appendix C as amended)

Desired Conditions for the Upper Gorge (Wild Segment)

Desired Ecosystem Condition: This stream is an area exhibiting natural succession and maturing of forest stands into an old-growth, late-successional condition. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally

American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks with numerous occurrences of species associated with mesophytic forests. Yellow pines may occur on the most exposed sites. Forest openings occur naturally. The river is free flowing with water quality that meets federal and state standards.

Desired Facility and Human Activities: This area is managed to provide a Semi-primitive Non-motorized Recreation Opportunity Spectrum (ROS) experience near trails, access points, and other areas of concentrated use. ROS Primitive recreation experiences occur in the more remote areas. Access to the river corridor is limited to a few hiking trails provided primarily to protect natural resources rather than for the human comfort or convenience. Visitors are challenged to rely on their physical abilities and encouraged to follow primitive “leave no trace” recreational pursuits. Minimal facilities are provided, primarily to protect natural resources rather than for the comfort or convenience of visitors. As much as possible, facilities such as trailheads and bulletin boards are located outside the river corridor. Hiking, primitive camping, mountain biking, rock climbing, fishing, hunting, canoeing, kayaking, and rafting occur where they do not diminish the area’s outstandingly remarkable values. The Forest Service, on a case-by-case basis, allows temporary use of motorized vehicles and equipment. Recreational off-highway vehicle use off roads is not found in this area. Rarely will evidence of prescribed burning be found.

Desired Conditions for the Lower Gorge (Recreational Segment)

The forest plan describes desired future conditions for the ecosystem, facilities, and human activities on pages 3-58 and 3-59. The emphasis is that natural ecological processes and conditions should dominate, while some human influence exists. Outstandingly remarkable values should be protected and enhanced.

Desired Ecosystem Condition: This segment of the river and its corridor provide for a natural appearing forest interspersed with cliffhines. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks with scattered occurrences of species associated with mixed mesophytic forests. Oaks, and sometimes yellow pines and American chestnut, occur on ridges and the most exposed sites. Openings in the forest canopy occur as the result of natural processes as well as management activities. The river is free flowing with water quality that meets federal and state standards.

Desired Facility and Human Activities: The area should be managed primarily to provide Semi-primitive Motorized and Roaded Natural Recreation Opportunity Spectrum (ROS) experiences while protecting the area’s unique heritage resources and biological species. However, at the Gladie Cultural-Environmental Learning Center site a more Rural ROS is maintained. Dispersed recreation in addition to environmental and heritage education are major emphases for this area. Several trails, trailheads, and a few roads are managed to provide access. Among large expanses of forested area, some facilities, such as picnic areas, vistas, and primitive campsites, are

provided for the comfort and convenience of visitors. Some developments, such as small ponds and openings, enhance wildlife habitat. In places, ample opportunities to interact with others exist. For most of the area, however, there are opportunities for solitude. Limited reliance on personal physical abilities and primitive skills are required except for activities such as rock climbing, rappelling, and backpacking. Most types of outdoor recreation activities and wildlife enhancements occur where negative impacts to natural resources and forest visitors can be mitigated or controlled through regulation, facility design and operation, or other management. Recreational off-highway vehicle use and special uses not in keeping with the desired future condition do not occur in this area.

Occasionally, management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be occasionally manipulated to maintain the conditions that are consistent with the designation. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with the designation. Tree felling and removal using motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

Recreation Opportunity Spectrum

The forest plan Recreation Opportunity Spectrum (ROS) classifications along the wild and scenic river corridor include Roaded Natural, small portions of Rural near developed areas outside of wilderness, and Semi-Primitive Non-Motorized and Primitive in wilderness. In a Roaded Natural setting, there should be moderate evidence of human sights and sounds and moderate concentration of users at developed recreation sites. There are opportunities to socialize. In a Semi-Primitive Non-Motorized setting, there is a high probability of solitude, closeness to nature, and self-reliance. A Primitive setting is essentially unmodified natural environment, typically three or more miles from roads, with high probability of solitude. In a Rural setting, high interaction among users is common. Other people are in constant view (FSM 2310).

Limits of Acceptable Change

In 2008, we completed a public involvement process called Limits of Acceptable Change (LAC) (USDA Forest Service 2008). This process included development of opportunity zones described on a continuum from Pristine to Concentrated Use, with associated desired conditions for each zone as listed below:

- **Pristine:** Natural ecological processes are dominant. There are no developed maintained trails or roads. When recreational uses do occur, impacts are temporary and typically recover from year to year. Evidence of human activity is not readily apparent.
- **Primitive:** Natural ecological processes are dominant. There are no developed maintained trails or roads. Impacts from recreational use are generally temporary. Most impacts typically recover from year to year, although some may persist from year to year. Evidence of human activity is not readily apparent.
- **Semi-Primitive:** Predominantly natural appearing environment. Network of low use developed trails and dispersed recreation use opportunities. Recreational use is apparent in this zone, with associated environmental impacts generally low. Impacts from

recreational use often persist from year to year, but ecological and natural processes are only minimally affected.

- **Roaded Natural:** Characterized by natural landscapes modified to accommodate heavy use, although setting will still be predominantly natural appearing. Network of moderate to heavily used developed trails and roads. Impacts from recreational use often persist from year to year. Various modes of travel may be present.
- **Concentrated Use:** Characterized by natural landscapes obviously modified to accommodate heavy use. This area consists primarily of developed trailhead areas, but can include other areas of high visitation. These may include permanent facilities such as parking areas, toilet buildings, campsites, information boards, and roads. These areas may be hardened to withstand heavy visitor use. Recreational impacts persist from year to year.

We identified standards for resources in each zone, as well as potential management actions to address exceeded standards. These standards, or specific measures or thresholds of acceptable resource conditions, have been applied to develop the site-specific and adaptive management actions proposed alongside this planning effort.

Consideration of Climate Change and Carbon Sequestration

Changes in future climate, such as changes in precipitation, temperature, and sea level, need to be considered in future management of the Red Wild and Scenic River corridor, especially for projects that apply to ecological systems and recreation uses. Managing tree densities with thinning and prescribed fire will maximize carbon sequestration and reduce vulnerability of forest stands to water stress, insect and disease outbreaks, and fire (USDA Forest Service 2020b). Areas of the Red River Gorge and Red Wild and Scenic River corridor that are outside of the Clifty Wilderness are not suitable for vegetation management, unless to attain desired future conditions. The forest plan allows for vegetation management along the recreational segment of the corridor (standard 3.C.3-VEG-1, p. 3-60) to respond to stressors triggered from climate change such as disease or non-native invasive species outbreak. Vegetation management in Clifty Wilderness is restricted. Prescribed fire to maximize carbon sequestration and reduce vulnerability of forest stands to water stressors is permitted in areas of the Red River Gorge and Red Wild and Scenic River corridor outside of the Clifty Wilderness.

“As climate change persists for several decades, critical thresholds may be exceeded, causing unanticipated responses to some variables like increasing temperature and carbon dioxide concentrations” (USDA Forest Service 2020b). The high diversity of plants and animals in the Red River Gorge could pose a particular concern if the effects of changing conditions vary by species and forest type. If the frequency of severe flooding increases, the rate of stream bank damage will likely follow. Recreation users may find the area less attractive if tick and mosquito populations increase in response to warmer winters and extreme heat (USDA Forest Service 2020a).

Chapter 6: Implementation and Monitoring Plan

Visitor Capacity

The Wild and Scenic Rivers Act directs that river-administering agencies address visitor use capacities to protect the free-flowing conditions, water quality, and outstandingly remarkable values of designated rivers (Wild and Scenic Rivers Act, October 2, 1968). A capacity analysis was prepared to meet this requirement (USDA Forest Service 2021c).

Visitor capacity for the Red River focuses on locations where the amount of visitor use is most likely to first affect river values. For the Red River, the capacity analysis identifies two separate capacities—day use and overnight use. Day use focuses on destination points and land-based use outside of those destination points, providing estimated capacity for maximum people at one time and people per day. Overnight use focuses on campsite availability as defined by thresholds and desired conditions, providing an estimated capacity for people per night. We used desired conditions from the forest plan, the [Limits of Acceptable Change](#) process, visitor preferences from the past surveys, current and expected impacts to outstandingly remarkable values, and forest plan Recreation Opportunity Spectrum⁵ (ROS) classes to inform the estimates.

The capacity analysis also addresses desired future conditions for expanding shuttle services. Expansion of shuttle services can both provide for more one-way recreational opportunities within the corridor such as hikes and boat trips and increase capacity at destination points, trailheads, and boat launches by alleviating parking limitations. The capacity analysis includes an estimated maximum additional people per day due to park and ride shuttle services bringing visitors to the corridor from external locations. A summary of capacity estimates is provided below.

Destination Point Day Use

- 1,146 people at one time from parking
- 2,595 people per day from parking
- 1,440 people per day from shuttles
- 4,305 total people per day

Corridor Day Use Outside Destination Points

- Semi-Primitive LAC zone: 300 people per day
- Roaded Natural LAC zone: 600 people per day

⁵ The Forest Service uses the Recreation Opportunity Spectrum (ROS) to classify and describe a range of recreation opportunities available, described on a continuum ranging from primitive to urban (ROS Book 1986, FSM 2310). A Recreation Opportunity Spectrum setting is defined as the combination of physical, biological, social, and managerial conditions that give value to a place. By combining variations in these conditions, it is possible to provide a diversity of recreational settings for visitors to enjoy.

- Concentrated Use LAC zone: 900 people per day
- Total corridor day use outside listed destination points: 1,800 people per day

Overnight Use

- Wild segment: 150 people per night
- Recreational segment: 200 people per night
- Total overnight use in the corridor: 350 people per night

Final Wild and Scenic River Corridor Boundary

The Wild and Scenic Rivers Act requires that federally administered rivers in the national system have a legally established boundary. Section 3(b) of the Act states: The agency charged with administration of a component of the National Wild and Scenic Rivers System designated by subsection (a) of this section, . . . shall establish detailed boundaries therefore (which boundaries shall include an average of not more than 320 acres of land per mile measured from the ordinary high water mark on both sides of the river). The 2004 Daniel Boone National Forest Land and Resource Management Plan (forest plan) depicts a boundary that was identified to protect and enhance the river values identified in the forest plan and validated in this comprehensive river management planning process, as well as to align with the description read before Congress at the time of designation.

An administrative change is proposed under the 2012 Planning Rule (36 CFR 219.13(c)) to correct the boundary for the Red Wild and Scenic River depicted in the forest plan (Appendix G, figure G-12), through the use of modern survey technology to create a precise digital boundary as intended by the state for the wild segment and as authorized for the entire river corridor by the United States Congress. The recreational segment boundary depicted in the forest plan includes 1,440 acres along the river corridor. The forest surveyor refined the boundary from hand drawn maps into digitized maps using modern survey technology. A small sliver of land was undefined between the Clifty Wilderness boundary and a section of the Red Wild and Scenic River recreational boundary shown in the forest plan. We propose to clarify discrepancies in acreage and create consistency across the forest plan, boundary package to be submitted to Congress, and comprehensive river management plan, by making one clean boundary line between the current recreational segment boundary and the Clifty Wilderness boundary. The final acreage of the recreational segment of the river corridor with the proposed changes and modern mapping would be 1,597 acres, a change of 157 acres from that listed in the forest plan. Likewise, for the wild segment, we propose to clarify discrepancies in acreage and more precisely reflect the legal description for the state boundary as required in the Act designating the Red River (P.L. 95-625). The final acreage of the wild segment of the river corridor with the proposed changes would be 1,010 acres, a reduction of 86 acres from the 1,096 acres listed in the forest plan. [Figure 1](#) above depicts the proposed final boundaries for the Red Wild and Scenic River corridor.

Management Actions to Protect and Enhance

Section 10(a) of the Act requires river-administering agencies to protect and enhance the river values. To help meet this requirement, we are completing an environmental analysis for the comprehensive river management plan along with proposed site-specific and adaptive

management actions to address known impacts to river values in order to protect and enhance those values.

Proposed Activities and Infrastructure

Site-specific and adaptive management actions in the river corridor are proposed for analysis simultaneously with this plan (USDA Forest Service 2021a). Proposed designated campsites, trails, and infrastructure, along with limiting and restoration of unauthorized uses and impacts, are designed to protect and enhance river values. The proposed management actions will help to restore locations that have been degraded by heavy recreation use while providing for recreational opportunities in sustainable locations with adequate infrastructure to support those uses and minimizing impacts to other resources and river values.

Up to an additional 130 parking spaces are proposed along the recreational segment along with up to 12 shuttle stops. Up to forty picnic sites and 11 restrooms without running water or sewer infrastructure are also proposed along the recreational segment of the river to provide for recreational experiences while reducing resource impacts from users. Up to three new boat launches are proposed to provide hardened surfaces at sustainable river access locations and to provide shorter distances for boaters for the more novice experience and skill levels of many boaters on the river. Up to five river access points along the recreational segment are proposed for design and designation for swimming and other non-boating water recreation to reduce resource impacts and improve sustainability at these locations. Additionally, up to 10 front-country and 10 backcountry designated campsites are proposed along the recreational segment, as well as up to 15 backcountry designated campsites along the wild segment of the river within the Clifty Wilderness, depending on results from a Minimum Requirements Analysis. Likewise, designation, reroute, and redesign of up to 10 miles of unauthorized trails are proposed within the recreational segment of the river corridor, in addition to up to four miles in the wild segment of the river corridor.

Other user-created impacts including unauthorized campsites, trails, river access points, parking, and boat launches would be decommissioned and restored. Cliff-side access stabilization and hardening would rehabilitate heavily impacted cliffside locations. Forest orders would prohibit camping outside designated campsites and equestrian and bicycle use along the corridor. Campfires would be prohibited along the wild segment and limited to Forest Service fire rings and pedestal grills along the recreational segment. The proposed action prohibits parking outside designated parking areas and entry into closed restoration areas following restoration activities until vegetation grows and the area recovers to natural conditions.

Framework for Future Development, Design, and Activities

We anticipate that current Red River uses will remain popular into the future. While we expect that demand for recreation access and opportunities may continue to grow, the capacity analysis and proposed management actions to protect and enhance river values were developed to address current levels of use and impacts to resources. If demand increases in the future, we would need to revisit the capacity analysis and complete additional environmental analysis to assess infrastructure needed to sustain the use while carefully and thoughtfully planning for the protection and enhancement of the river's outstandingly remarkable values.

The USDA Forest Service should develop and follow design elements similar to those listed in Appendix A of the Environmental Analysis for all future development in the river corridor

(USDA Forest Service 2021a). In general, in addition to forest plan standards and guidelines and other relevant laws, regulations, and policy, we will follow Forest Service Handbook 2309.13 Recreation Site Handbook Chapter 10 – Planning and Design of Developed Recreation Sites and Facilities for any new or modified recreation sites or facilities in the river corridor.

We will develop design guidelines for the corridor to ensure all sites function together as a sequence of spaces that complement a wholistic experience for river visitors. Design guidelines should be based on concepts in the Built Environment Image Guide (BEIG) and are a framework that guides site planning and design. While each site is a unique location with site-specific design solutions, sharing some uniform design elements will ensure a consistent look throughout the corridor, create positive experiences for visitors, and reinforce the quality and ideals of the Forest Service. Design guidelines may include vegetation planting techniques, species list, building materials, path and road surfacing, barrier rock type, traffic control devices, toilet buildings, site furniture, green infrastructure approaches to stormwater management, and low impact techniques for bank stabilization.

We will designate, reroute, and maintain trails and trailheads in accordance with Forest Service Handbook 2309.18 – Trails Management Handbook Chapter 20. All future ground-disturbing activities and recreation site development must follow Forest Service National Best Management Practices for Water Quality Management on National Forest Lands (USDA 2012) and Forest Service Handbook 2309 Chapter 12.9 policy on grading and drainage.

Staff from the Daniel Boone National Forest should work cooperatively with Kentucky Transportation Cabinet (KYTC) to develop a byway management plan for KY-715 and -77 segments designated as a National Scenic Byway and incorporate the goals and objectives of this comprehensive river management plan and the design elements described above and listed in Appendix A of the Environmental Analysis for this project (USDA Forest Service 2021a).

Potential Future Management Actions

[Monitoring](#) may identify thresholds reached, which could trigger additional management actions needed to reduce impacts to resources and protect and enhance river values. Some potential future management actions not included in the analysis for this planning effort (USDA Forest Service 2021a) are listed below⁶.

Education

- Install educational signs at developed sites and facilities.
- Educate about low impact practices such as Leave No Trace.
- Educate about non-native invasive species prevention.
- Educate about alternate recreation opportunities including other locations and lower use times.
- Educate about human impacts to resources including erosion, trampling of vegetation, etc.

⁶ Additional future management actions will require additional development of a proposed action and future environmental analysis, where applicable. All proposed projects in the corridor would be checked for consistency with this plan during the future analysis.

- Educate and broadly distribute information about the locations of designated system trails and discourage off-trail use.

Enforcement

- Enforce prohibitions and use limitations in forest orders and illegal activities.
- If other river values are being impacted, consider a permit system, one-way requirement, or quota.
- If water quality thresholds are exceeded, reduce water contact recreation.
- Use clear delineation and signage for designated trails and campsites.

Future Infrastructure

Construct and improve sustainable facilities, trails, and river access points not included in the analysis for this planning effort (USDA Forest Service 2021a) if needed, following required analysis, and where appropriate, predominantly along the recreational segment in accordance with forest plan and relevant law, regulation, policy, and design elements as described [above](#).

Historic Structure and Archaeological Site Impacts:

- First occurrence: conduct a cultural resources survey to evaluate whether it is an archaeological site or historic structure; if so, record it and report to SHPO, following SHPO standards including a detailed plan view map of site or shelter surface and photographs showing compacted area or unauthorized trail to track change with future monitoring.
- Second occurrence: if monitoring reveals user activity continues to disturb a documented site or structure, install metal wire fence to block foot traffic.
- Third occurrence: if metal fencing cannot prevent continued use, evaluate site or structure for National Register of Historic Places eligibility (Phase II investigation).

Shuttle Opportunities

Actions proposed simultaneously with this plan include construction of up to 12 shuttle stops along the wild and scenic river corridor. Currently, small-scale shuttle operators provide services on demand and are limited in number of passengers and locations. In 2020, three shuttle operators obtained temporary permits to operate in the Gorge. Existing shuttle operators most commonly assist hikers in one-way trips, shuttling them back to their personal vehicle parked at a trailhead or boat launch along the river corridor, therefore facilitating recreation opportunities without increasing visitation numbers. Expansion of shuttle services can both provide for more one-way recreational opportunities such as hikes and boat trips and increase capacity by providing park and ride opportunities that alleviate parking limitations within the corridor.

No regularly scheduled shuttle services are proposed at this time, but this may be a viable future option to address increasing visitor demand while limiting parking needs and resource impacts along the corridor. Current and near-term shuttle use is expected primarily to facilitate rides on demand for hikers and boaters back to their starting location within the corridor. Future large-scale or long-term shuttle operators, such as a regularly scheduled park and ride shuttle to destination points, would require separate NEPA analysis and authorization under a special use permit. Each permit-holder is required to operate under an annually approved plan of operations and provide end of year use data as required by the Forest Service. This use data could help to

determine use levels, priority locations, and provide more information about inter-gorge use versus visitors arriving by shuttle in the river corridor from outside the national forest. The plan of operations could be used to limit the number of visitors arriving by shuttle at any location by day, week, month, or year. If the numbers estimated in the capacity analysis are exceeded, a forest interdisciplinary team would re-examine and revise the capacity analysis at that time, ensuring consistency with this plan and the forest plan (USDA Forest Service 2021c).

Utilities

Many utility corridors in the Gorge were established prior to becoming National Forest System lands. Some utilities operate along deeded rights-of-way, while others or parts of others are under special use permit by the Forest Service. Opportunities to minimize utility corridors' impacts on outstandingly remarkable values should be pursued where possible; however, the agency may have limited ability to influence utility companies where the agency does not have right of way ownership.

Where and when feasible, move all utilities including power lines, phone lines, and other future utilities underground to protect and enhance outstandingly remarkable values. If underground utilities would interfere with protecting and enhancing outstandingly remarkable values, overhead utilities may be used in those locations where practicable.

Evaluation of Water Resource Projects

Section 7 of the Wild and Scenic Rivers Act directs federal agencies to evaluate federally-assisted or -permitted water resource projects to ensure that existing conditions of designated river values (free-flowing condition, water quality, and outstandingly remarkable values) are not diminished. A section 7 determination is required for any water resources project proposed within or below, above, or on a stream tributary to Red River. A section 7 analysis will determine whether a proposed water resources project within Red River would have a "direct and adverse" effect on Red River or whether a proposed water resource project below, above, or on a stream tributary would "invade" Red River or "unreasonably diminish" its river values. More guidance on the section 7 process can be found in the IWSRCC technical report *Wild & Scenic Rivers Act: Section 7* (IWSRCC 2004).

A section 7 analysis has been prepared for the eight water resources projects proposed along with this comprehensive river management plan, including three proposed boat launches and five constructed river access points along the recreational segment of the river. Future water resources projects proposed within or below, above, or on a stream tributary to Red River will be subject to the appropriate section 7 analysis described in current guidance.

Monitoring Plan

A monitoring strategy is a key element of a comprehensive river management plan and is important to helping ensure visitor use does not degrade river values (IWSRCC 2002; IWSRCC 2018). This section identifies indicators, thresholds, and associated data collection that will inform assessment of river value conditions. Monitoring is important to ensure that changes stay within acceptable levels and do not compromise the protection and enhancement of river values. Where possible, monitoring programs that are already being conducted for other management purposes were selected to help ensure this monitoring plan is attainable.

Some visitor-caused impacts to outstandingly remarkable values are a result of irresponsible and illegal visitor behavior rather than the amount of use (for example, vandalism and failing to follow regulations and forest orders). We plan to address these impacts through enforcement and education.

Resource Indicators, Thresholds, and Monitoring

Table 4 below identifies indicators related to river values and associated thresholds that would trigger potential management actions. Table 5 lists proposed monitoring activities with frequencies to ensure that river values are protected and enhanced and to identify when thresholds are reached and triggers for potential future management actions. Sample methods can and should be changed if better means become available.

Table 4. Resource Indicators and Thresholds

Indicator	Connected River Value(s)	Threshold(s)	Source
1. Visitor satisfaction with number of encounters	Recreation	80% of the time, 80% of visitors are satisfied or neutral with the number of encounters	Limits of Acceptable Change Process
2. Destination point ⁷ condition class ⁸	All	Pristine and Primitive LAC zones: no destination point with a condition class greater than zero. All other LAC zones: no destination point with a condition class greater than 4.	Limits of Acceptable Change Process
3. New bare areas attributed to visitor use on stream banks and floodplains	Scenery, Botany, Water Quality	Any new bare ground area that exceeds 300 square feet in areas not planned as a managed area.	Based on forest soil scientist and hydrologist professional judgement

⁷ Destination points are defined as areas of interest that have disturbed vegetation, surface litter, or soils caused by human use. These areas include small arches, overlooks (vistas), rappel areas, waterfalls, and water access points.

⁸ This condition class scale from LAC ranges from zero (no visible impacts) to 5, most impacted:

<p>Class 0: Destination Point barely distinguishable; no or minimal disturbance of vegetation and /or organic litter. Often an old area that has not seen recent use.</p> <p>Class 1: Destination Point barely distinguishable; slight loss of vegetation cover and /or minimal disturbance of organic litter.</p> <p>Class 2: Destination Point obvious; vegetation cover lost and/or organic litter pulverized in primary use areas.</p> <p>Class 3: Vegetation cover lost and/or organic litter pulverized on much of the site, some bare soil exposed in primary use areas.</p> <p>Class 4: Nearly complete or total loss of vegetation cover and organic litter, bare soil widespread.</p> <p>Class 5: Soil erosion obvious, as indicated by exposed tree roots and rocks and/or gullyng.</p> <p>Rock: Destination Point on bedrock.</p>

Indicator	Connected River Value(s)	Threshold(s)	Source
4. Disturbance of surfaces within rockshelters and overhangs from visitor activity	Archaeology and History, Scenery, Botany, Geology	Disturbance of soils or rock features within a rockshelter or overhang resulting from human use or activity that the archeologist determines to be destructive to the resource. Disturbance includes but is not limited to compaction of soils from trails and camping, excavation or soil displacement of any kind, fire hearths and fire pits, and graffiti.	US Fish and Wildlife Service ⁹ and State Historic Preservation Office requirements
5. Human-caused disturbance of soils in open air locations (e.g., ridgetops, benches)	Archaeology and History, Scenery	1 square meter of area in which soils have been disturbed to a depth that extends into the soil deposits below the forest duff or leaf litter or any disturbance that exposes artifacts. Examples include unauthorized trails, campsites, destination points, and eroded banks.	State Historic Preservation Office requirements
6. Water quality rating	Water Quality, Fisheries	Below fair rating ¹⁰	Watershed plan (2015) and state water quality standards
7. <i>E. coli</i> levels	Water Quality, Fisheries	No lower than state standard ¹¹	Watershed plan (2015) and state water quality standards

Table 5. Proposed Monitoring

Monitoring	Frequency	Connected River Value(s)	Notes
Monitoring and adaptive	Annually*	All	Track progress on implementing management actions and monitoring activities.

⁹ Rockshelters may support sensitive plants and animals.

¹⁰ Fair water quality scores indicate that water quality does not meet the standard or support the designated uses of cold water or warm water aquatic habitat based on macroinvertebrate sampling.

¹¹ (a) *Escherichia coli* content shall not exceed 130 colonies per 100 ml as a geometric mean based on not less than five (5) samples taken during a thirty (30) day period. Content also shall not exceed 240 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period for *Escherichia coli*. Fecal coliform criteria listed in subsection (2)(a) of this section shall apply during the remainder of the year.

Monitoring	Frequency	Connected River Value(s)	Notes
management plan implementation tracking			
Destination points: Condition class, parking lot utilization, parking turnover, illegal parking, and people at one time	Ad hoc during regular patrols by Forest Service staff	All	Track any changes to condition class at destination points. Track number of vehicles at each destination parking lot and number of people at each point. Track parking turnover per day. If this does not align with the user capacity identified, consider enforcement, adaptive management actions, site design, or potential to consider needs for additional user capacity.
New unauthorized trails	Ad hoc during regular patrols by Forest Service staff	All	Map locations of any new unauthorized trails and rehabilitate or restore impacted areas where feasible.
Visitor satisfaction	Every 5 years as funding is available or partners can support	Recreation	Determine if 80% of visitors are satisfied 80% of the time. ¹² Develop specific questions about acceptable ranges of encounters and destination point space per person.
National Visitor Use Monitoring (NVUM)	Every 5 years	Recreation	The Forest Service conducts National Visitor Use Monitoring (NVUM) every five years. NVUM results for the general forest area provides data regarding visitor demographics, satisfaction, and trip characteristics (USDA 2018).
Wilderness Stewardship Performance	Annually	Recreation	Monitoring of invasive species, air quality, recreation sites, trails, agency management actions, opportunities for solitude, cultural resources, workforce capacity, education, and wilderness character baseline in Clifty Wilderness.
Wilderness Character Monitoring	Every 5 years	Recreation	Monitors trails, campsites, and other impacts to assess overall trends in preserving wilderness character in Clifty Wilderness.
Water Quality Best Management	Randomly for baseline establishment	Water, Fisheries	The National Best Management Practices (BMP) program was developed to improve management of water quality consistently

¹² Use the same questions as the previous surveys (Alexander, 2006 and Sharp, 2014)

Monitoring	Frequency	Connected River Value(s)	Notes
Practices (BMPs)	and post notification of known pollution event.		with the Federal Clean Water Act and state water quality programs. BMPs are specific practices or actions used to reduce or control impacts to water bodies from nonpoint sources of pollution, most commonly by reducing the loading of pollutants from such sources into storm water and waterways.
<i>E. coli</i> levels	Frequency will depend on time of year and flow levels and will be conducted in compliance with state standards	Water, Fisheries	Measure levels, identify probable cause, and implement adaptive management actions, education, and enforcement, as needed.
Rockshelters and rock overhangs	Monitor sites in accordance with agreements with USFWS and SHPO	History/ Archaeology	Rockshelter and overhang settings often contain sensitive archaeological remains; a sample of these locales will be visited annually to track the effects of user activity.

* Frequency will be determined by available funding and organizational capacity, and therefore, may occur less frequently than annually.

Water Quality Monitoring

The Red River Gorge Watershed Plan and Restoration (2015) documents appropriate monitoring strategies needed to assess watershed conditions over time. Success of implementation activities will be determined through two separate but related activities: tracking the implementation and outcome of activities and effectiveness of best management practices listed in the plan, and monitoring water quality in Swift Camp Creek.

The first set of monitoring tasks, tracking activity measures, would consist of documenting the planning, execution, and outcome of improvements listed in the watershed management plan, including environmental education programs, community clean-up days, installing recreation best management practices, and repairing septic systems. These actions are critical for building awareness of water quality issues in the Red River Watershed, increasing understanding of the technical aspects of recommended management practices, building support for best management practice implementation, and providing overall support for water quality improvement.

The second set of monitoring tasks would involve documenting changes in water quality in the watershed. Watershed partners and the Daniel Boone National Forest project staff will need to craft a post-implementation monitoring plan for the sub watersheds where best management practices are implemented. At a minimum, this will involve monitoring *E. coli* in Swift Camp Creek. A successful monitoring plan will address other impairments that have been identified.

The monitoring plan will be designed to monitor for parameters targeted by state monitoring requirements and best management practices for each area.

Implementation

We propose to implement this plan in collaboration with partners, volunteers, and the public. While forest staff can accomplish some of the proposed activities and monitoring, support from partnerships with federal, state, and local agencies; businesses; non-profit organizations; volunteer groups; and interested individuals will be critical to the success of this plan. We will seek funding from federal sources and outside grants, in addition to working with partners including state and local government to identify ways to support these projects.

The Daniel Boone National Forest has many engaged partners, and we have learned about additional interested individuals and organizations through this planning process. We will continue to engage partners, stakeholders, and the public on a regular basis through plan and project implementation, reaching out to those who express interest to involve them in project implementation, monitoring, and ongoing work to protect and enhance river values within the corridor.

Implementation of proposed management actions will occur over time, with priority given to designating campsites and restoring areas with greatest resource impacts. Many of the proposed management actions will be implemented using adaptive management, based on site-specific conditions at the time of implementation. Monitoring will determine effectiveness of actions to improve resource conditions and protect and enhance river values and trigger modification of actions as needed to meet intended effects.

Appendix A: Forest Plan Direction

Goals and Objectives for the Upper Gorge (Wild Segment)

- **3.C.1-Goal 1.** Maintain and enhance the natural character of the river and its corridor by reducing adverse impacts from private development and use.
 - **3.C.1-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within the river corridor.
 - **3.C.1-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.
- **3.C.1-Goal 2.** Protect and enhance the outstandingly remarkable values that qualified this area as a Wild and Scenic River. These are: scenic, recreational, geological, heritage, aquatic, and botanical values.
 - **3.C.1-Objective 2.A.** Protect and maintain significant heritage resources in consultation with the State Historic Preservation Officer and interested federally recognized tribes.
 - **3.C.1-Objective 2.B.** Maintain the river's free-flowing condition. Ensure that it meets federal and state water quality standards.
 - **3.C.1-Objective 2.C.** Maintain and enhance the recreational opportunities associated with the river and its corridor.
 - **3.C.1-Objective 2.D.** Coordinate with the Kentucky Natural Resources and Environmental Protection Cabinet on management of this Kentucky Wild River in accordance with current or future agreements.
 - **3.C.1-Objective 2.E.** Protect the aquatic and riparian habitats that support native species.
 - **3.C.1-Objective 2.F.** Complete limits of acceptable change process with public input.

Standards for the Upper Gorge (Wild Segment)

Minerals

- **3.C.1-MIN-1.** The lands within $\frac{1}{4}$ mile of the wild river bank are statutorily withdrawn from operation of the mineral leasing laws.

Engineering

- **3.C.1-ENG-1.** Any water resources project will be evaluated under the appropriate standard of section 7 of the Wild and Scenic Rivers Act.

Recreation

- **3.C.1-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of Semi-primitive Non-motorized, and Semi-primitive Motorized.

Goals and Objectives for the Lower Gorge (Recreational Segment)

- **3.C.3-Goal 1.** Maintain and enhance the natural character of the river and its corridor by reducing adverse impacts from private development and use.
 - **3.C.3-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within the river corridor.
 - **3.C.3-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.
 - **3.C.3-Objective 1.C.** Limit non-recreational special use authorizations to only those necessary for basic public service and Forest Service objectives, where no other reasonable options are available.

- **3.C.3-Goal 2.** Protect and enhance the outstandingly remarkable values that qualified this stream as a Wild and Scenic River. These are: scenic, recreational, geological, heritage, aquatic and botanical values.
 - **3.C.3-Objective 2.A.** Protect and maintain significant heritage resources in consultation with the State Historic Preservation Officer and interested federally recognized tribes.
 - **3.C.3-Objective 2.B.** Maintain the river's free-flowing condition. Ensure that it meets federal and state water quality standards.
 - **3.C.3-Objective 2.C.** Maintain and enhance the recreational opportunities associated with the river and its corridor.
 - **3.C.3-Objective 2.D.** Coordinate with the Kentucky Natural Resources and Environmental Protection Cabinet on management of this Kentucky Wild River in accordance with current or future agreements.
 - **3.C.3-Objective 2.E.** Protect the aquatic and riparian habitats that support native species.
 - **3.C.3-Objective 2.F.** Complete the Limits of Acceptable Change process with public input.

- **3.C.3-Goal 3.** Provide for ROS Semi-primitive Motorized or Roaded Natural recreational experiences. Maintain a more Rural ROS experience at the Gladie Cultural-Environmental Learning Center site.
 - **3.C.3-Objective 3.A.** Provide and maintain access to the river and its corridor.
 - **3.C.3-Goal 4.** Maintain and enhance the recreational opportunities associated with the area, particularly dispersed recreational activities such as fishing, canoeing, kayaking, scenic viewing, hiking, camping, backpacking, and rock climbing.

Standards for the Lower Gorge (Recreational Segment)

Minerals

- **3.C.3-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity. Development of federally owned oil and gas is subject to the No-Surface-Occupancy stipulation.

Engineering

- **3.C.3-ENG-1.** Any water resources project will be evaluated under the appropriate standard of section 7 of the Wild and Scenic Rivers Act.

Recreation

- **3.C.3-REC-1.** Take action to protect qualifying heritage sites if they are adversely impacted, or will probably be adversely impacted, by human use.
- **3.C.3-REC-2.** Prohibit campfires and camping within 100 feet of the base of clifflines or the back of rock shelters unless at a designated site.
- **3.C.3-REC-3.** Allow no horses or other livestock within this area except on trails designated for such use or as specifically authorized.
- **3.C.3-REC-4.** No trails will be designated for off-highway vehicle use.
- **3.C.3-REC-5.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural.

Vegetation

- **3.C.3-VEG-1.** Vegetation management will only occur:
 - a) To maintain or protect existing facilities or for the construction of new facilities
 - b) To protect against fire, insect, disease, non-native species that threaten to negatively impact the area's outstandingly remarkable values
 - c) When needed to protect or restore the natural ecosystem of the area
 - d) To protect the public
 - e) To provide for fish and wildlife habitat
 - f) To provide for viewing of a point of interest
 - g) For interpretation of heritage and natural resources.

Appendix B: References

- Alexander, Sara E. Baylor University. 2006. Red River Gorge: A study of relationships and use patterns among recreationists and residents. Accessed at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346575.pdf
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