

3.3.2 Scenery

SUMMARY OF FINDINGS

Currently in the upper Chattooga, scenery impacts within the river corridor are from soil compaction, erosion and vegetation damage associated with existing use as follows: dispersed camping and user-created trails; human waste and trash accumulation; and, erosion associated with undesignated roadside parking. With all alternatives, recreation users passing through the corridor may see multiple incidents of these scenery impacts. However, all action alternatives propose a reduction in parking (except Alternative 4) and elimination of unsustainable campsites and trails which serve to reduce cumulative impacts to scenery resources.

Alternative 1 may result in the greatest degree of cumulative scenery impact, since there is no regulation of camping and user-created trails beyond how the corridor is currently managed. With its limits on campsite density and user permit system, cumulative effects to scenery would be minimized with Alternative 2. All other alternatives would have varying degrees of cumulative scenery impacts depending on allowed use levels, and river miles open to boating: more use will result in greater impacts.

AFFECTED ENVIRONMENT

Generally, Wild segments on the upper Chattooga are inaccessible by road, have a natural-appearing character and dramatic natural beauty. Scenic segments include road crossings, bridges and developed recreation sites; though these segments have high quality scenery, they contain obvious signs of human modification. Recreational segments may have major road crossings, large bridges, roads paralleling the river within the corridor, more intense recreation development, or tracts of private land with development. The scenic character of these segments may include frequently-seen human modifications and, although still visually distinctive, represent the lowest level of scenic quality among the three designations.

The Sumter and Chattahoochee National Forest management plans incorporate the Scenery Management System (SMS) while the Nantahala National Forest management plan uses the Visual Management System (VMS). Though these systems differ in the way inventories are conducted, the resulting scenery management objectives differ primarily in terminology. Both systems base inventories and management objectives on viewer concern level, viewing distance and scenic characteristics of the visible landscape.

Currently scenery impacts within the river corridor are from soil compaction, erosion and vegetation damage associated with existing use as follows: dispersed camping and user-created trails; human waste and trash accumulation; and erosion associated with undesignated roadside parking.

Direct and Indirect Effects

Alternative 1

Negative impacts to scenery would continue under this alternative as existing campsites are closed and new sites appear to replace them. Each new site would have its share of connecting user trails, vegetation damage, fire rings, soil compaction, erosion, human waste and trash accumulation—all of which detract greatly from the area's scenic quality. Some existing roadside parking has become eroded and unattractive, and may continue under this proposal.

Alternative 2

This alternative would have the least impact to scenic quality and would actually enhance scenic conditions to a greater extent than other alternatives by reducing visible areas of bare ground/erosion and trash/vegetation damage and restoring a natural-appearing landscape. Though management of human waste or trash accumulation is not specifically addressed in this alternative, it will minimize aesthetic degradation associated with these impacts by reducing overall use.

Alternative 3

Like all action alternatives, this alternative reduces scenery impacts through proposed campsites and trail management; but, use in the Chattooga WSR corridor is expected to increase in the future. By not restricting use, the inevitable increase in use will continue to create scenery impacts from soil compaction, erosion, vegetation damage and human waste/trash accumulation.

Alternatives 4, 5, 8, 9 and 10

Like alternatives 2 and 3, some management actions will improve scenic quality within the corridor. However, boating would provide additional means of accessing remote sections of river such as those designated as Wild segments. This new use would increase overall use in the corridor, and increase scenery impacts from portage and access trails. Though some portage trails would be identified and constructed to specification, other user-created portage trails will appear with no authorization or review by managers. These user-created portage trails will almost certainly occur within the riparian zone, on highly erodible soils and across steep slopes. Resulting soil compaction and/or erosion will negatively impact scenery. In addition, use and associated scenery impacts at boater put-in and take-out locations will increase.

Boating may also introduce another new impact to scenery: boat markings on rocks. As a hard-shell kayak hits river rocks, a mark the same color as the boat will be left behind. Often whitewater kayakers are brightly colored, which makes the rock markings stand-out in the natural landscape. Boating at different flows would result in markings at various levels on the rocks. At normal flows, these residual boat markings may appear several feet above the water-level. Certain rocks would be struck repeatedly because of their location in the river channel, so higher use levels may result in more heavily scarred rocks with multi-colored streaks. These impacts will degrade the aesthetics of the natural appearing landscape; however, the amount of marking

and the degree to which it will impact scenery is difficult to predict given new materials being used in the manufacturing of boats and kayaks.

The addition of boating in the upper Chattooga also increases the potential for unauthorized LWD removal in sections of the upper Chattooga opened to boating (see Section 3.2.3 Aquatic Species and Habitat). Cut marks will degrade the aesthetics of the natural appearing landscape; however, the amount of cutting and the degree to which it will impact scenery is difficult to predict.

Alternatives that open longer reaches of river to boating will have greater scenery impacts; those with higher use levels will also create greater impacts. This is true for the boating-specific scenery impacts stated above, soil compaction and vegetation damage resulting from an overall increase in existing and boater use and aesthetic impacts of additional human waste and trash accumulation.

However, alternatives 4 and 8 propose an “adaptive management” component that could use registration, monitoring or surveys to determine the need for implementation of additional use restrictions. This approach could help reduce scenery impacts associated with introduction of a new use and an overall increase in use.

Cumulative Effects

With all alternatives, recreation users may see multiple incidents of soil compaction, erosion, vegetation damage, boat marking on rocks, human waste or trash accumulation. However, all action alternatives propose new parking (except Alternative 4), campsite and trail actions which will serve to reduce cumulative impacts to scenery resources.

Alternative 1 may result in the greatest degree of cumulative scenery impact, since there is no regulation of camping and user-created trails beyond how the corridor is currently managed. With its limits on campsite density and user permit system, cumulative effects to scenery would be minimized with Alternative 2. All other alternatives would have varying degrees of cumulative scenery impacts depending on allowed use-levels and river miles open to boating: more use will result in greater impacts.

Beyond proposed actions in the current range of alternatives, no other past, present or foreseeable future actions would measurably contribute cumulative impacts to scenic resources in the Chattooga wild and scenic river corridor.

3.3.3 Human Health and Safety (Search and Rescue)

Recreating on NFS lands is not without risk, especially recreating close to or in rapidly flowing rivers such as the Chattooga River. The Chattooga drops approximately 1,500 feet in elevation within the 20-mile section from Grimshaws Bridge downstream to the Highway 28 bridge. The river has an ever-changing bottom ranging from accumulations of sand and sediments to a rough and rocky bottom with a substantial distribution of large and irregularly shaped boulders within its banks. Downed trees may also be present, particularly in the narrower sections in the upper reaches. The addition of LWD from dying Hemlock is likely to add to these risks. Removal of LWD by the public would not be compatible with the Wilderness designation nor with aquatic habitat goals and objectives. Whereas combining these attributes with recreational use results in inherent risks to the user, some users consider it part of the experience defined by the challenge, adventure and satisfaction from knowing that natural dangers have been successfully negotiated.

Since 1970, 39 fatalities have occurred on the Chattooga River—all below Highway 28. Thirty-one of these were directly or indirectly associated with floating. All but one of these floating fatalities were self-guided boaters; the other was a guide on a commercially guided training trip. Ten fatalities are known to be associated with the use of rafts, nine with kayaks, four with canoes, two with inner tubes and one with an inflatable kayak.

The Forest Service promotes safety on the river in a variety of ways including: requiring recreationists to use protective equipment in certain sections; prohibiting certain craft types in some sections; restricting paddling alone in some sections; and by posting pertinent safety information on maps, brochures, websites, permits and signs.

South Carolina, North Carolina and Georgia have delegated authorities for search, rescue and recovery activities on the Chattooga River to local sheriff's departments. The Forest Service cooperates in search, rescue and recovery efforts with local sheriffs, search and rescue (SAR) organizations, the state natural resource agencies, outfitter/guide companies and others.

According to staff on the Andrew Pickens Ranger District, a range of five to ten SAR operations are conducted each year associated with boaters on the Chattooga River. Most deal with self-guided boaters, the majority of which are not very highly impactful (i.e. generally associated with people who do not return from a trip at the originally scheduled time). However, a small number of these operations can be and are generally associated with fatalities or accessing and transporting injured persons from remote areas. Since January 1993, seven fatalities were associated with boating; four were associated with hiking or swimming.

The following information on SAR impacts associated with potential boating on the upper Chattooga is based on Whittaker and Shelby (2007).

- Specific characteristics of a river can substantially influence fatality rates. Fatality rates maybe as high as 1 in 4,000 user days (Class V Russell Fork KY) because of sieve and undercut hazards, or as low as 1 in 1,000,000 (Class IV New River Gorge, WV) where powerful hydraulics may flip boats but rarely cause fatalities. Walbridge thought the Class IV-V Upper Youghigheny, PA might be a good point of comparison for the upper Chattooga

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in terms of difficulty; the first fatality occurred in the past year after about 30 years of higher use than is expected on the upper Chattooga.

- On Tennessee's Class IV Big South Fork National River, there has been one fatality in about 25 years of regular boating (150-day season, peaks about 100 private boaters per day), but SAR responses are generally required about two times a year. The eight-mile gorge segment of this river is similar to the upper Chattooga with limited road access, which presents some SAR response challenges. However, impacts from these responses have not been a substantial issue for management.
- The frequency of similar hazards on the upper Chattooga is not known. Despite consistent hiking, swimming and angling use on the upper Chattooga for at least two decades, there do not appear to have been any fatalities above Highway 28 and SAR responses are rare.
- About half of the lower Chattooga fatalities apparently required larger-scale SAR responses or body extractions. SAR squads apparently respond to the river about six to eight times per year (not always for a fatality), although the Forest Service does not track these incidents.
- The American Whitewater accident database identifies two accidents on Overflow Creek (generally considered more difficult than the upper Chattooga by the expert panel), but apparently neither was a fatality. Walbridge reports that several other boaters have been injured on Overflow, but they have generally walked out or self-rescued. Several sources agree that many non-fatal accidents during whitewater boating are "handled" and never reported; a major factor is the skill and experience in the group (or passing groups). In general, Class IV-V boaters have first aid and swiftwater rescue experience, but some wonder if this is declining among younger boaters.
- Hendricks estimated varying rates of SAR incidents on several NC rivers. At the high end of the spectrum, the new flow releases on the Cheoah appear to be relatively more dangerous because of live trees in the channel due to low base flows for several decades; the river has already had one fatality and appears to require a SAR response about every other release. On the other end of the spectrum, the Class II-III Nantahala has only one to two SAR incidents a season despite very high use (although this is expected to increase as new relicensing flow releases are provided in the more challenging gorge).
- If SAR or body extraction efforts are required on the upper Chattooga, there may be impacts related to access to the scene for staff and equipment. Wilderness designation complicates the use of some equipment and access, although "minimum tool" analyses and a pre-accident plan with "equipment approval levels" have been developed for other rivers in NC with similar constraints.

Estimating the number and type of incidents (or the associated SAR impacts) that may occur if boating were allowed is challenging. However, if boating were allowed on the upper Chattooga, it is anticipated that there would be some accidents, injuries and eventually a fatality. Based on likely use levels and information from other rivers of similar difficulty, these numbers would likely be low and few would require SAR responses.

3.3.4 Heritage Resources

SUMMARY OF FINDINGS

This analysis reviewed known heritage resources information for the upper Chattooga, including nine heritage resource sites that have been identified in the corridor. Activities resulting in ground disturbance (hiking and camping) have the most potential to cause impacts to heritage resources. Areas where disturbance was identified around camp sites and trails near major river access points were examined for heritage resources by a Forest Service archaeologist to determine if any heritage resources were being affected by current users or would be affected by new user groups. This analysis determined that Alternative 1 would have limited or no effect on heritage resources and all of the other alternatives would avoid impacts to known heritage resources.

AFFECTED ENVIRONMENT

Very little heritage resource inventory has been completed for the upper Chattooga River. Inventories of areas in the national forests outside of the river corridor have identified use beginning in the prehistoric PaleoIndian Period (10,000 B.C.) and continuing to the present (Benson 2006). Table 3.3-5 describes the known heritage resources.

Table 3.3-5. Known Heritage Resources On The Upper Chattooga

Resource	State	Type	Culture Period	N. Register Historic Places
Bull Pen Bridge	NC	CCC steel truss bridge	early 20 th century	eligible
Bull Pen Gold Mine	NC	historic period mine	19 th /early 20 th century	not evaluated
Ellicott Rock	NC,SC,GA	boundary monument	early 19 th century	on register
Winchester Cemetery	SC	cemetery	early 19 th century	not eligible
Chattooga Town 38OC18	SC	Cherokee village earlier occupations, Euro-American farm	17 th , 18 th , 19 th , 20 th century, Late Archaic, Woodland, Mississippian Periods	eligible
9RA125	GA	prehistoric lithic scatter, historic period house site	Early Archaic, early 20 th century	not evaluated
9RA126	GA	prehistoric artifact scatter	Woodland Period	not evaluated
9RA127	GA	Cherokee village	17 th , 18 th century, part of Chattooga Town on GA side of the river.	not evaluated
Lick Log House	SC	historic period house site	19 th /20 th century	not evaluated

Heritage resource information from inventories of surrounding areas and the Southern Appalachian Region suggest that additional undiscovered heritage resource sites are present on the upper Chattooga (Benson 2006). Level areas such as raised benches and near-level ridge noses near the river or tributary streams have a high potential for containing prehistoric archaeological sites including short-term camps and small farmsteads. Rock shelters used in

prehistoric or historic periods may be located in steep slopes. Historic period house sites also may be found in areas near the river or creeks where several acres of cultivable bottoms exist. Additional remains of historic period mining and logging activities near the river, as well as traditional cultural properties, also may exist.

Proposed management alternatives were examined for potential effects to heritage resources. The magnitude and nature of activities related to the alternatives, the nature and extent of potential effects to heritage resources, and the likely nature and location of heritage resources within the upper Chattooga River corridor were taken into account. Biophysical impacts likely to disturb archaeological sites were located, mapped and measured by the Forest Service (USDA Forest Service 2007). Activities resulting in ground disturbance (hiking and camping) have the most potential to cause impacts to heritage resources. Most biophysical impacts have been found at river access points, camp sites and on trails. Disturbances directly related to boating will be largely restricted to the river and areas immediately adjacent to the river. These areas have been disturbed by the river and are not likely to contain significant archaeological sites.

Areas where disturbance was identified around camp sites and trails near major river access points (Burrells Ford, Lick Log Creek and the Highway 28 bridge) were examined for heritage resources by a Forest Service archaeologist to identify the extent of current ground disturbances and determine if any heritage resources were affected by current users. The Eastern Band of Cherokee Indians was consulted to identify heritage resources of importance to the tribe.

Direct, Indirect and Cumulative Effects of Alternative 1

This alternative would have limited or no effect on heritage resources. Examination of camp sites, trails and heavily used areas at several points along the river found no heritage resources disturbed by current uses. Most camps near the river were covered by recent alluvium which would bury any older heritage resources. Ground disturbance at camp sites was minimal and limited to small areas. Many trails were in low probability areas for archaeological sites. Under this alternative, enforcement of current standards would close and rehabilitate many user-created campsites. These sites may be replaced with new user-created campsites that would add to overall ground disturbance and possibly affect unknown heritage resources.

Direct, Indirect And Cumulative Effects Of All Other Alternatives

All other alternatives would avoid impacts to known heritage resources. Use of designated camp sites and designated trails only would avoid potential effects to heritage resources from user created camp sites and trails. Any new trail construction or designated camp sites would be reviewed for effects to heritage resources. Direct disturbances related to boating would be restricted to the river and areas immediately adjacent to the river; these areas have been scoured and disturbed by the river and are expected to contain few heritage resources.

List of Preparers and Agencies/Persons Consulted

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Jeanne Riley – Fisheries Biologist (FMS)
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Core Team – Responsible for developing and leading the process within budget and time constraints. This team took the lead in developing alternatives for the EA and ensuring its completion.

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Other Major Contributors

William Hansen – FMS Hydrologist (hydrology data collection/analysis; estimates of boatable days; hydrologic record analysis; hydrology information connected with Berger and Whittaker and Shelby reports; information in Appendix C; and review of technical hydrologic content)

Mary Lou Addor, Steve Smutko – Natural Resources Leadership Institute (Public Meetings)

Doug Whittaker, Bo Shelby – Confluence Research Consulting (Social Analysis)

Karen Klosowski – The Louis Berger Group (Literature Review)

Ben Ellis – The Louis Berger Group (Boater Expert Panel runs)

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APPENDICES

APPENDIX A – Outstandingly Remarkable Values of the Chattooga Wild and Scenic River

In 1974, when the river was designated by Congress as a part of the National Wild and Scenic Rivers System, the river possessed several outstandingly remarkable values including geology, biology, scenery, recreation and history. The following is a description of the ORVs developed for the revision of the Sumter Land Management Plan.

Geology

The geologic and geomorphologic values of the Chattooga, as described in the 1971 Wild and Scenic River Study Report for the Chattooga River, included the deeply dissected escarpment and the steep, rocky, forested slopes that plunge into deep, narrow gorges.

There are a series of outstanding monolithic treeless domes and slopes of exposed resistant granite, which occur at the upper headwaters of the river. Another feature of the river is that it flows into the Atlantic Ocean whereas most other rivers in the Southern Appalachian flow into the Gulf of Mexico. It is likely that the Tugaloo River (formed by the confluence of Chattooga and the Tallulah) captured these rivers from the Chattahoochee River. A stream capture of this magnitude is unusual in the region.

Biology

There is a variety and richness of plant life within the Chattooga watershed, including the Chattooga wild and scenic river corridor. The unique geography and climate characteristics provide habitats for uncommon assemblages of endemic, disjunct, and relic plant species. The rarest species within the Chattooga River Gorge landtype are Southern Appalachian endemics: liverworts, rock gnome lichen, Blue Ridge bindweed, Fraser's loosestrife, Manhart's sedge, Biltmore's sedge, pink shell azalea and divided leaf ragwort. Old growth communities comprise almost 10 percent of the corridor. Federal and state agencies consider several non-game wildlife species within the watershed sensitive species.

Scenery

The scenery along the Chattooga River is exceptional. The scenery plays an important part in the wild and scenic river experience. The river is deeply entrenched between high ridges for large stretches of its length. Steep forested slopes on either side of the river give a feeling of seclusion. The river constantly meanders and curves and there are excellent views along these bends. The seasons change the landscape from the varying soft greens of spring and summer to a patchwork of red, yellow and orange. Winter finds the leaves stripped away and the patches of green from the white pines stand out against the gray-brown hillsides and exposed rock formations. The river itself provides a varying scene from a smooth flowing stream to a river with thundering falls and cascades, raging rapids, enormous boulders and cliff-enclosed deep pools.

Recreation

The recreation values of the river and corridor are outstanding along its 57-mile course. The river offers a wide variety of activities in a high-quality setting. Activities range from swimming to hiking and horseback riding with spectacular scenery to excellent trout fishing and nationally recognized white-water rafting opportunities. Other activities include backpacking, photography and nature study. Most of these activities take place in largely unmodified natural surroundings with many opportunities for remoteness and solitude.

History

Very little systematic survey has been completed in the river corridor. A total of 38 archaeological sites have been recorded within the corridor. These include 15 prehistoric sites, 15 historic house and farmstead sites, a railroad embankment, two historic cemeteries, a 19th century mineral prospecting pit and a rock shelter. Approximately half of these sites are considered potentially eligible for the National Register of Historic Places. The Cherokees village of Chattooga Town was occupied from the early 1600s until the 1730s when it was abandoned. The site is near the present day Highway 28 bridge. This site is eligible for the National Register of Historic Places.

APPENDIX B – Implementation Strategy and Monitoring Questions

Implementation

Estimates of probable projects, activities, additional personnel and agency costs are provided below. These items are considered estimates since the number, location and the rates in which projects are implemented are driven by available funding and additional decisions informed by site-specific analysis in accordance with agency rules and regulations. Additional personnel and associated costs are estimated in table B-1.

Reduce campsite density

- Inventory and map (GPS) all campsites
- Develop criteria for recommending which campsites would be designated
- Scoping and NEPA
- Close, rehabilitate and sign closed sites
- Monitoring and enforcement

Reduce trail density

- Inventory and map (GPS) all user-created trails
- Develop criteria for recommending which trails would be designated
- Scoping and NEPA
- Close, rehabilitate and sign closed trails
- Monitoring and enforcement

Close parking within ¼ mile of Burrells Ford

- Install signage
- Monitoring and enforcement

Camping Reservations

- Monitoring and enforcement
- Fees and the use of <http://www.recreation.gov>

Boater Registration

- Develop permit
- Install permit boxes and signage
- Develop/modify database
- Monitoring, data input, enforcement
- Some alternatives will require the use of <http://www.recreation.gov> and fees

User Registration

- Develop permit
- Install permit boxes and signage
- Develop database
- Monitoring, data input, enforcement
- Development, implementation, enforcement and monitoring of direct and indirect adaptive management strategies

Table B-1. Estimated Implementation, Monitoring And Enforcement Needs By Alternative. Staffing Positions And Thousands Of Dollars Per Year (Minimal/Optimal)

Alt	Georgia		NC		SC		Shared		Totals	
	Staffing	\$	Staffing	\$	Staffing	\$	Staffing	\$	Staffing	\$
2	0.5 / 1	24 / 48	0.5 / 1	24 / 48	1 / 2	47 / 94	1 / 2	85 / 132	3 / 6	180 / 322
3	0.25 / 0.5	12 / 24	0 / 0.25	0 / 12	0.5 / 1	24 / 47	1 / 2	85 / 132	1.75 / 3.75	121 / 215
4	0.25 / 0.5	12 / 24	0.25 / 0.5	12 / 24	0.5 / 1	24 / 47	1 / 2	85 / 132	2 / 4	133 / 227
5	0.25 / 0.5	12 / 24	0.25 / 0.5	12 / 24	0.5 / 1	24 / 47	1 / 2	85 / 132	2 / 4	133 / 227
8	0.5 / 1	24 / 48	0.5 / 1	24 / 48	1 / 2	47 / 94	1 / 2	85 / 132	3 / 6	180 / 322
9	0.25 / 0.5	12 / 24	0.25 / 0.5	12 / 24	0.5 / 1	24 / 47	1 / 2	85 / 132	2 / 4	133 / 227
10	0.25 / 0.5	12 / 24	0.25 / 0.5	12 / 24	0.5 / 1	24 / 47	1 / 2	85 / 132	2 / 4	133 / 227

Monitoring

In addition to the current Land Management Plan Monitoring requirements for the Chattooga wild and scenic river corridor and Ellicott Rock Wilderness Area, two additional monitoring questions have been developed to guide the collection of information necessary to ensure that goals, objectives, trends, and estimated affects are occurring as anticipated for this analysis. Regardless of which alternative is selected, adaptive management principles are key considerations in identifying what elements to measure and the techniques to be utilized to measure the elements. The monitoring questions below constitute the LMP monitoring decision. Below each question is the probable monitoring item and general technique that may be used to collect information. Again, based on findings and new information, the monitoring element and the techniques used may be changed and will not be considered a plan level decision.

1. Are site impacts from recreation use above Highway 28, additional large woody debris from hemlock mortality and removal of large wood debris by users affecting rare plant species and aquatic habitats?

Item: Rare Species, Aquatic Habitats, LWD

Technique: Direct Survey

2. Above Highway 28 is the solitude component of the recreation ORV being maintained? Are the encounter levels within established desires and estimates? Has the experience of historical recreation users been diminished due to the introduction of boating?

Item: Recreation Use by activity
On-Water and Off-Water Encounters
Technique: User Survey, Direct Observations of Encounters

Specific Requirements for Implementing Monitoring Question #1:

For all action alternatives

1. LWD would be monitored annually for the first two years after these alternatives are implemented and periodically thereafter, depending on need.
2. The following two lengths of the Chattooga River would be searched annually for any downed trees spanning the river and requiring portage:
 - Confluence with Norton Mill Creek downstream to Bull Pen Road Bridge
 - 0.6 mile length downstream of point where Fowler Creek Trail (# 431) intersects Chattooga River Trail. The upstream portion is in NC; however the primary search area is along the NC and SC boundary

For alternatives 4, 9 and 10 reconnaissance should take place prior to the start of the boating season. For alternatives 5 and 8 reconnaissance should take place approximately three times during the year.

If portage is deemed necessary, a site-specific decision under the appropriate NEPA process will be made. The analysis will include a survey of the site to determine the presence of the following rare species:

- *Lejeunea bloomquistii* or *Listera smallii* on the CONF;
- *Chiloscyphus muricatus*, *Homalia trichomanoides*, *Bryoxiphium norvegicum*, *Cephalozia macrostachya* ssp. *australis*, *Plagiomnium carolinianum*, or *Plagiochilla sullivantii* var. *sullivantii* on the NNF;
- *Lophocolea appalachiana* for either the NNF or the CONF.

If any of these rare species are located, the decision would ensure boaters traversing that stretch of the river would avoid impacts.

Specific Requirements for Implementing Monitoring Question #2:

Should encounters exceed the respective encounter limits (“on trail” and “in river” by river section by day or by weekend/weekday) on 20% of days (weekend or weekdays, whichever comes first) in one calendar year for two consecutive calendar years, indirect measures will be employed in an attempt to lower encounters. Then, after two

consecutive calendar years of implementing indirect measures, if encounters continue to exceed limits, more direct measures (i.e. self registration, permits, reservations) will be implemented for all users to manage the level of encounters.

APPENDIX C – Flow Level and Boatable Day Estimates

In the EA, the average number and range of “boatable” days in alternatives 4 – 10 were calculated by using a “mean daily flow” (MDF) method (Whittaker and Shelby 2007). MDF used in the description of the boating alternatives (i.e. alternatives 4 – 10) is defined as the average flow that occurs over a 24-hour day and is typically reported as cubic feet per second (cfs). The determination of MDF is made after numerous estimates of flow during a day are compiled and averaged.

For implementation, the Forest Service may predict a boatable day using methods other than MDF if it provides a more effective prediction of a boatable day. Other methods would likely produce more or less predicted boatable days. The key factor with any method of predicting a boatable day is to use the approximate flow level as described by Whitaker and Shelby (2007) when separation of various users occurs.

Another prediction approach is to use the Minimum Flow Level (MFL) method. The MFL is defined as when flow levels are predicted to or actually do reach a designated flow level at least once during a 24-hour day.

Given that a variety of methods could be used (or refined in the future) to predict boatable days, a sensitivity analysis was conducted to assess the encounter calculations sensitivity to increasing or decreasing boatable days during implementation (see the Encounter Sensitivity Analysis in the project file). The sensitivity analysis used the MFL method to estimate the average number of boatable days. Table C-1 displays a comparison of predicted boatable days between the MDF and MFL methods by alternative. (For a more comprehensive discussion of these two methods, see “Background Estimates of Days with Boatable Flows in the North Fork Chattooga River from Existing Chattooga River and Other Data” (Hansen 2008 in the project file).

The sensitivity analysis found that the number of encounters per day would not change based on the number of boatable days. However, as would be expected, the number of days with boater-generated encounters would increase proportionately to the increase in the number of boatable days.

Table C-1. Estimated Average Annual Number Of Boatable Days By Alternative, Prediction Method (MDL And MFL) Using 68- And 16-Year Data Sets And Flow Level (Cfs).

	4	5	9	10
	Dec 1 – Mar 1	Oct – Sep	Nov 1 – Mar 31	Nov 1 – Mar 1
68 year MDF				
350 cfs	12.7	37.9	20.9	14.4
450 cfs	5.8	17.4	9.8	6.8
16 year MDF				
350 cfs	12.4	38.1	21.1	15
450 cfs	6.3	18.3	10.5	7.9
16 year MFL				
24-hour period				
350 cfs	19.1	*	30.8	23.1
450 cfs	11.6	*	*	*
16 year MFL				
Daylight only				
350 cfs	15.5	*	25.9	19
450 cfs	9.2	*	*	*

* Not calculated.

APPENDIX D

Encounter Calculations

Existing User Encounter Information

1. Specific information about trail encounters has not been collected for most parts of the Chattooga River. The following information/assumptions were used for analysis purposes:
 - Average trail encounter estimates for Ellicott Rock Wilderness (Rutlin 1995) were collected by researchers over three seasons from users who were contacted at major trailheads.
 - Encounters have increased with the increase in population since 1995, based on *Use Estimation Workshop* judgments (Berger and CRC 2007).
2. The Use Estimation Workshop (Berger and CRC 2007) brought together local agency experts to estimate and describe the current level of use in the Chattooga River corridor by recreation opportunity type and location.
3. Data about the relationship between use and encounters is not available. The 1995 Rutlin study did not attempt to estimate use or to correlate it with encounters. However, a comparison was made between that study's average encounter estimates and current use estimates from the Use Estimation Workshop (Berger and CRC 2007) in order to develop an approximate relationship between the two and estimate average encounters for the Chattooga.

Assumptions about Existing User Encounters

Average **on-trail** encounters per day were estimated from the results of the Use Estimation Workshop (Berger and CRC, 2007) by applying the following formula:

50% of day hiking GAOT³ + 50% of backpacking GAOT + 25% of angling PAOT (except for Nicholson Fields reach where angling is assumed to be 50% also)

Day hikers and backpackers are assumed to represent all recreation opportunity types in the corridor not categorized as anglers.

³ GAOT refers to "Groups at one time" and PAOT refers to "People at one time."

Average **on-river** encounters per day were estimated from the results of the Use Estimation Workshop (Berger and CRC, 2007) by applying the following formula:

25% of angling PAOT (except Nicholson Fields reach, where 50% is used)

Day hikers and backpackers are assumed NOT to contribute to on-river encounters (they are on-river for a much shorter amount of time than anglers).

- The 50% estimate for day hiking and backpacking use on-trail assumes average encounters to be about half of all groups using the trail system in a particular reach. This assumption is based on consideration of the findings from Rutlin 1995, Berger 2007a Limited Use Monitoring Summary, and Berger and CRC 2007 Use Estimation Workshop Summary.
- Angling estimates during the workshop (Berger and CRC 2007) were provided in PAOTs because that is the more important indicator for fishing quality and because it fits with the available creel data (which was organized by people, not groups). Since average group size for anglers is one (Berger and CRC 2007), PAOTs for anglers equals GAOTs. For trail encounters, however, it is assumed that anglers spend about half their time on trails (since they are headed to their favorite fishing spot) when compared to hikers/backpackers. Therefore, encounters for anglers on trails is assumed to be 50% of 50% of PAOTs or 25% of PAOT.
- Average on-river encounters between anglers are assumed to be 25% of PAOT since the ground covered while fishing is less than that covered while walking on trails, and because backcountry anglers tend to space themselves out along the river to minimize encounters with each other. The one exception to this would be in the Nicholson Fields reach (delayed harvest reach from Lick Log to Highway 28) where average encounters between anglers would be 50% of PAOT (Durniak 2007). This is assumed to be the case both on-trail -because the trail is close to the river for a good portion of the Nicholson Fields reach, and on-river -because the low gradient of the channel and availability of trails along both banks allow for easier travel within the corridor.

Example Calculations for Estimating Existing User Encounters

Table 1. Use Estimation Workshop Results (Berger And CRC 2007) In GAOT And PAOT For The Ellicott Rock Reach (ERR) From December Through February.

Ellicott Rock Reach	Weekdays		Weekends	
Day Hiking (GAOT)	Average	Peak	Average	Peak
Dec	1	2	2	2
Jan	1	2	2	2
Feb	1	2	2	4
	Weekdays		Weekends	
Backpacking (GAOT)	Average	Peak	Average	Peak
Dec	0.5	1	1	1
Jan	0.5	1	1	1
Feb	0.5	1	1	2
	Weekdays		Weekends	
Backcountry Angling (PAOT)	Average	Peak	Average	Peak
Dec	0.5	1	1	2
Jan	0.5	1	1	2
Feb	0.5	1	1	2

A. Ellicott Rock Reach On-Trails December to February

Using the data in Table 1, use estimates were converted to encounters for the three user group categories and added together using the following formula (derived from the above assumptions and relationships):

50% of day hiking GAOT + 50% of backpacking GAOT + 25% of angling PAOT

The results are shown in Table 2 (e.g. for average weekdays in December: $[0.5*1] + [0.5*0.5] + [0.25*0.5] = 0.5 + 0.25 + 0.125 = 0.875 \sim 0.9$ encounters).

Table 2. Total On-Trail Encounters Between Existing Users (hikers, backpackers and backcountry anglers) for the Ellicott Rock reach (ERR) from December Through February.

Total Encounters	Weekdays		Weekends	
On-Trails (ERR)	Average	Peak	Average	Peak
Dec	0.9	1.8	1.8	2.0
Jan	0.9	1.8	1.8	2.0
Feb	0.9	1.8	1.8	3.5