

# Appendix **A**

## National Park Service Director's Orders



## APPENDIX A: NPS DIRECTOR'S ORDERS

NPS Director's Orders consulted as part of this planning process are listed below, followed by a description of the purpose of each order.

- #6: Interpretation and Education
- #12: Conservation Planning, Environmental Impact Analysis, and Decision Making
- #28: Cultural Resource Management
- #28B: Archeology
- #48: Commercial Services
- #77: Natural Resource Management
- #77-1: Wetland Protection
- #77-2: Floodplain Management
- #83: Public Health
- #87A: Park Roads Standards

### **Director's Order #6: *Interpretation and Education***

Director's Order #6 was approved in December, 1986. The purpose of this Director's Order is to supplement *Management Policies* with operational policies and procedures necessary to maintain effective, high-quality interpretive and educational programs. This order supports goal categories I and II of the NPS Strategic Plan, which call for "Preserving Park Resources" and "Providing for the Public Enjoyment and Visitor Experience of Parks." This order also states:

The goal of the NPS interpretive and educational programs is to provide memorable and inspirational learning and recreational experiences, foster the development of a personal stewardship ethic, and broaden public support for preserving park resources (NPS 2004i).

### **Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making***

Director's Order #12, was approved on January 8, 2001. This directive, with its associated handbook, offers guidance by which the NPS carries out its responsibilities to implement the policy and procedures specified under the National Environmental Policy Act of 1969 (NEPA). NEPA describes the process by which decisions are made relating to Federal actions that have the potential to affect resources such as water, air, endangered and threatened species and, economic and recreational opportunities. Director's Order #12 recommends the following (NPS 2001d and 2001e):

- Use of interdisciplinary approaches and principles in decision-making;
- Decisions based on technical and scientific information;
- Establishment of benchmarks demonstrating best management processes (such as resource councils and project review teams) in development, analysis, and review of projects;
- Use of alternative dispute resolution and other processes to resolve internal and external disputes;
- Peer review panels to address conflicts among resource specialists regarding validity and interpretation of data and resource information;
- Analysis of impairment of resources as part of the environmental impact analysis process; and
- Post-litigation review and analysis of decision-making for potential improvements to resource-based decisions.

### **Director's Order #28: *Cultural Resource Management***

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Director's Order #28 was issued in 1998, along with NPS-28, *Cultural Resource Management Guideline*. In recognizing the importance of protecting cultural resources, this order provides guidelines for management decisions and activities that could affect cultural resources directly or indirectly (NPS 1998c). The order was created as a supplement to the NPS *Management Policies* document. This directive provides guidance on management of cultural resources and includes sections concerned with the following:

- *research*: to identify, evaluate, document, register, and establish other basic information about cultural resources;
- *planning*: to ensure that this information is well integrated into management processes for making decisions and setting priorities; and
- *stewardship*: under which planning decisions are carried out and resources are preserved, protected, and interpreted to the public.

### **Director's Order #28B: Archeology**

This director's order was approved October 12, 2004 as a supplement to Director's Order #28. It recognizes the importance of protecting archeological resources and provides information needed to implement laws and policies when carrying out certain activities that have the potential to affect these resources. This directive provides management guidelines for planning, reviewing, and undertaking archeological activities and other actions that may affect archeological resources within the National Park System. It also outlines the way in which the NPS can fulfill its responsibilities to provide assistance with archeological resources located outside the national parks. This order and its reference manual provide more specific guidance on particular archeological subjects than Director's Order #28 and the Cultural Resource Management Guideline Release No. 5 (NPS 1998d).

### **Director's Order #48: Commercial Services**

Director's Order #48 consists of two parts, #48A: Concessions Management, and #48B: Commercial Use Authorization. Both parts are in the process of development and since neither of these director's orders have been approved, the principal source of guidance on these issues is Chapter 10 of the 2001 edition of *Management Policies* (NPS 2000). Chapter 10: *Commercial Visitor Services* provides direction for policies concerning concessions operations, contracting and planning for commercial visitor services. Authorization of a concessions contract is based on whether the facility or service :

- Is necessary and appropriate for the public use and enjoyment of the park in which it is located, and identified needs are not, nor can they be, met outside park boundaries;
- Will be provided in a manner that furthers the protection, conservation, and preservation of the environment, and park resources and values;
- Incorporates sustainable principles and practices in planning, design, siting, construction, utility systems, selection and recycling of building materials, and waste management; and
- Will enhance visitor use and enjoyment of the park without causing unacceptable impacts to park resources or values.

### **Director's Order #77: Natural Resource Management**

Director's Order #77 is being developed to serve as a reference manual that replaces NPS #77: The Natural Resource Management Guideline, issued in 1991. This director's order provides complete guidance for National Park employees charged with the management, conservation and protection of existing natural resources within the National Park System. Sections concerned with air, cave and karst features, disturbed land, freshwater, geologic resources, paleontological

resources and soils have been completed. Additional sections regarding resource uses, planning, and program administration and management are included as well. Other sections will be added as they are reviewed and comments from resource specialists are incorporated (NPS 2004k).

#### **Director's Order #77-1: Wetland Protection**

Director's Order 77-1 was issued in 1998 to replace 1980 wetland guidance and then reissued October 30, 2002 to provide policies, requirements and standards that translate the intent of Executive Order 11990 into procedural practice. Executive Order 11990: "Protection of Wetlands" (42 Federal Register 26961) was issued in 1977 by President Carter. The purpose of the executive order was to "... avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative..." The goal of "no net loss of wetlands" was adopted in 1989 and continues to be supported by subsequent administrations. Some of the provisions included in Procedural Manual #77-1 are (NPS 2002e):

- a long term goal of increasing net wetlands throughout the parks
- wetland inventories will be conducted throughout the parks or acquired from sources such as the National Wetlands Inventory
- the publication "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al. 1979) will be used as the standard for defining, classifying and inventorying wetlands
- when planning a new action or development, the NPS will first avoid adverse wetland impacts where practicable, then minimize impacts that can not be avoided, and only mitigate (through restoration of degraded wetlands) when there are unavoidable adverse wetland impacts

#### **Director's Order #77-2: Floodplain Management**

Director's order #77-2 was issued on September 8, 2003 with its associated Procedural Manual 77-2 to replace Special Directive 93-4, "Floodplain Management." The purpose of this director's order is to carry out the intent of Executive Order 11988, "Floodplain Management", issued May 28, 1980. The goal of the executive order was "to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative" (NPS 2003e). The director's order requires Federal agencies to take steps during project planning and develop policy that will:

- Reduce the potential for losses due to flooding;
- Minimize the risks posed by floods on human safety, health and welfare; and
- Restore and preserve the natural and beneficial values of floodplains.

#### **Director's Order #83: Public Health**

On August 3, 2003, Director's Order #83: Public Health was issued to replace the 1999 edition of the order. The purpose of this director's order is to ensure that NPS complies with public health legislation when operating and maintaining food service, water supply and waste management facilities, public beaches, swimming pools and lodging facilities. The NPS Public Health Program aids in evaluating parks for potential health risks and environmental compliance. Public Health Program staff instructs NPS personnel on issues pertaining to health hazards and provides information via fact sheets, submissions to Ranger Morning Reports and its internet and intranet web sites. Modifications were made to the previous edition that included the following (NPS 2003f):

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- Parks are not required to operate drinking water systems under more rigorous guidelines than the primacy agency's requirements
- Parks are not required to operate wastewater systems under more rigorous guidelines than the primacy agency's requirements
- Operators of non-public drinking water systems must have appropriate training, but certification is not required
- Guidance concerning bathing beaches, swimming pools, and spas and hot tubs is combined in the Recreational Waters section
- An additional section regarding vector-borne and zoonotic diseases is included

### **Director's Order #87A: Park Roads Standards**

Director's Order #87A was issued on July 9, 1984 to provide guidance regarding construction and maintenance of National Park Service roads. This director's order was developed by the Road Standards Task Force with technical assistance from the Federal Highway Administration. It was intended to replace the 1968 Park Road Standards and include appropriate procedures to comply with requirements under the Surface Transportation Assistance Act of 1982. The standards were developed while taking into consideration the need for NPS to protect and preserve the natural and historical resources of the parks. The standards are intended to provide flexibility during the planning and design phases to account for variations in the type of use and terrain surrounding and underlying roadways or proposed roadways (NPS 1984).

# Appendix B

## Cultural and Historic Landscape Assessment



**APPENDIX B      CULTURAL AND HISTORIC LANDSCAPE ASSESSMENT  
FOR THE ELKMONT HISTORIC DISTRICT, GREAT SMOKY MOUNTAINS  
NATIONAL PARK, SEVIER COUNTY, TENNESSEE**

Submitted to:

GREAT SMOKY MOUNTAINS NATIONAL PARK  
107 Park Headquarters Road  
Gatlinburg, Tennessee 37738

In Partial Fulfillment of Contract  
GS-00F-0006L  
D546001A120

Submitted by:

TRC GARROW ASSOCIATES, INC.  
3772 Pleasantdale Road, Suite 200  
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Under Subcontract SC-2003002-6554 to:

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APRIL 2004

## EXECUTIVE SUMMARY

TRC Garrow Associates (TRC) conducted a cultural and historic landscape assessment for the Elkmont Historic District (EHD) in Sevier County, Tennessee, during 2003–2004. The work was performed as a subcontractor to T N & Associates (TN&A) of Milwaukee, Wisconsin, which was contracted by the National Park Service (NPS) to prepare an Environmental Assessment (EA) and a General Management Plan Amendment for the EHD in Great Smoky Mountains National Park (GRSM). In 2003, GRSM made the decision to elevate the EHD planning process from an EA to an Environmental Impact Statement (EIS). The landscape assessment begun under the EA has been carried forward to the EIS. During 2003, TRC and TN&A undertook background research, field survey, data analysis, preparation of a detailed historical chronology, and preliminary mapping. In 2004, the team prepared refined maps and this assessment narrative.

As stated in the project Statement of Work, the primary purpose of the landscape assessment was to determine if data existed to support the recommendation of cultural landscape management zones in the EHD. Through the production of plan maps from five identified historic periods, emphasis was placed on how Euro-American settlement patterns affected spatial organization, land use, and use of the natural environment. Review of historic maps, photographs, drawings, and texts identified the topography, vegetation, circulation, natural systems and features, views and vistas, buildings and structures, and small-scale features in the EHD in each historic period. Understanding the landscape over time permitted informed analysis of what remains of the significant cultural landscape, as well as what does not remain or is no longer apparent.

The assessment has determined that the surviving landscape characteristics and features in the EHD have retained their integrity. Moreover, because the characteristics and features are located in an NRHP-listed historic district and they retain their integrity, they are recommended contributing to the EHD. In terms of cultural landscape management zones, the characteristics and features are evenly distributed throughout the District to the point that the definition of zones is not warranted—in essence, the EHD is a cultural landscape management zone in and of itself.

Because most of the surviving landscape characteristics and features would remain under six of the seven alternatives proposed for impact analysis under the current EIS, and because a natural resource-based alternative—Alternative A, which calls for removal of all manmade features at ground level or above—is needed to provide a full range of alternatives in the group of alternatives being studied, another alternative focusing on conservation of the landscape characteristics and features is not required. Therefore, none of the proposed draft alternatives would have to be changed or eliminated in the EIS process.

Large-scale cultural and historic landscape maps and a large historic photograph display sheet have been prepared by TN&A for this assessment and for use at public meetings associated with the EIS. Reduced copies of the maps are presented as figures in this narrative. Supporting historical graphics, photographs, and drawings have been assembled and are being submitted under separate cover, as required by the contract. In addition, the data gathered for this assessment will be utilized by GRSM to assist public interpretation and education efforts regarding the development of the EHD and the creation of the National Park.

## **ACKNOWLEDGEMENTS**

TRC would like to extend its thanks to Ian Shanklin, landscape architect at GRSM, who provided overall project direction and coordination. Annette Hartigan, curator of the library and archives at GRSM, provided her expertise on materials housed in the GRSM collections and assisted TN&A and TRC researchers in their efforts.

TRC also is appreciative of the individuals who shared their personal photographs of Elkmont. These include Julie Brown, Charlotte Burdette, Eleanor Dickinson, Katherine Kuhlman, Bill Lawhorn, Mayna Avent Nance, Doug Redding, and Ed Thompson.

TN&A project managers Jackie Little, Rose Chmielewski, and Barbara Garrow served as points of contact with GRSM and provided oversight for all products produced by TN&A and TRC. At TN&A, Jenni Hendricks assisted with the background research, and Perry Childress assisted in the field survey and analysis, and prepared the draft cultural and historic landscape maps. Peter Schoephoester prepared the final versions of the maps, which appear as figures in this document.

At TRC, Jeff Holland conducted the background research. Todd Cleveland performed the field survey and analysis, and authored this report. Vince Macek put together the report graphics.

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## **I. INTRODUCTION**

During 2003–2004, TRC Garrow Associates (TRC) conducted a cultural and historic landscape assessment for the Elkmont Historic District (EHD) in Sevier County, Tennessee. TRC conducted the work as a subcontractor to T N & Associates (TN&A) of Milwaukee, Wisconsin, which was contracted by the National Park Service (NPS) to prepare an Environmental Assessment (EA)/General Management Plan Amendment for the EHD, which is within the Great Smoky Mountains National Park (GRSM). In 2003, GRSM made the decision to elevate the EA to an Environmental Impact Statement (EIS). The cultural and historic landscape assessment begun under the EA has been carried forward with the EIS. During 2003, TRC and TN&A undertook background research, field survey, analysis, preparation of a historical chronology, and preliminary mapping. In 2004, the team prepared refined maps and this assessment narrative.

As dictated in the project Statement of Work, the chief purpose of the cultural and historic landscape assessment was to determine if data existed that would uphold the recommendation of cultural landscape management areas or zones within the EHD. Through the preparation of plan maps from five identified historic periods (see Table 1), attention was given to how Euro-American settlement and occupation patterns affected land use, spatial organization, and use of the natural environment. Inspection of historic maps, photographs, drawings, and textual references identified the topography, natural and cultural vegetation, circulation, natural systems and features, views and vistas, buildings, structures, and small-scale features present in the EHD during each of the five historic periods. Understanding the landscape over time permitted an informed analysis of what presently remains of the historically significant cultural landscape, as well as what no longer remains or is no longer apparent.

**Table 1. Historic Periods Addressed in the EHD Cultural and Historic Landscape Assessment.**

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1.	Pre-National Register of Historic Places (NRHP) Listed Period of Significance: 1880s–1907
2.	NRHP Listed Period of Significance 1908–1942: Sub-period 1908–1913
3.	NRHP Listed Period of Significance 1908–1942: Sub-period 1914–1924
4.	NRHP Listed Period of Significance 1908–1942: Sub-period 1925–1932
5.	NRHP Listed Period of Significance 1908–1942: Sub-period 1933–1942

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Large-scale landscape maps and a large historic photograph display sheet have been prepared by TN&A for the assessment and for use at EIS-related public meetings. Reduced copies of the maps appear as figures in Chapter III. Supporting historical graphics, photographs, and drawings have been assembled and are being submitted under separate cover. In addition, the data gathered for the assessment will be used by GRSM in public interpretation and education efforts regarding the development of the EHD and the creation of the National Park.

For detailed information describing and locating the individual landscape features at each cabin and structure within the EHD, refer to the cultural resources baseline report prepared by TRC.<sup>1</sup>

## II. METHODS

### ***DATA REVIEW, RESEARCH, AND MAPPING***

The process of preparing the cultural and historic landscape assessment for the EHD began with a review of data provided by GRSM. The data included a CD of select historic drawings and photographs, text on the history and development of the District, photographs of the cabins taken in 2001, and current landscape drawings in CAD format prepared by Jerry McGee, a former GRSM landscape architect. The data also included copies of historic photographs provided by the public at the various meetings and workshops held in the fall of 2002 for the EA process. Following the data review stage, TRC identified gaps in the existing data that would need to be filled to satisfy the objectives of the assessment. The purpose of this exercise was to provide focus to the upcoming research phase so that it could be executed as efficiently as possible. TRC and TN&A staff then spent one week at the GRSM archives reviewing and collecting historic drawings, maps, and photographs pertaining to the broad landscape characteristics and individual landscape features of the EHD during the five periods listed in Table 1.

The collected data were then organized and analyzed, and the historic drawings, maps, and photographs illustrating topography, vegetation, watercourses, circulation patterns, and landscape elements were keyed to their appropriate location within the EHD according to the applicable cultural and historic landscape period. Histories of Elkmont and textual references to the landscape were reviewed to obtain descriptions of land use and to aid in the identification and placement of landscape features illustrated in the drawings, maps, and photographs. It should be noted that many of the graphic images did not identify the specific location of the landscape features depicted on them, other than a general location of “Elkmont” or “Appalachian Club area” or “campground.” TRC and TN&A staff used written histories, field survey, and cross-checking of other drawings, maps, and photographs to establish the locations of many of the individual landscape features and to identify the placement of views shown in the photographs.

TRC and TN&A staff then formulated statements reflecting the overall landscape theme of each period (see Table 1). These statements summarized the key events that were occurring in the EHD prior to and during the District’s period of significance. Major changes in land use and spatial organization served as dividing points in the history of the EHD and were used to separate that history into defined periods. Each period was then depicted on its own cultural and historic landscape map (see Chapter III). As part of this exercise, a detailed historical chronology was prepared listing all of the key events impacting the EHD landscape between the 1880s and 1942.

### ***FIELDWORK AND ANALYSIS***

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<sup>1</sup> Cleveland, Todd, Larry McKee, Paul Webb, David S. Leigh, Steve Gaddis, and Tasha Benyshek. *Cultural Resources of the Elkmont Historic District, Great Smoky Mountains National Park, Sevier County, Tennessee*. Submitted to Great Smoky Mountains National Park, Gatlinburg, Tennessee, by TRC Garrow Associates, Atlanta, Georgia, 2002. A copy of the report can be viewed online at <http://www.elkmont-gmpa-ea.com/BaselineRept.html>.

Staff utilized field survey to compare current conditions with the historic appearance of the EHD. This enabled TRC and TN&A to determine how and to what extent the area had changed since 1942, the end date of the fifth study period. As noted above, the fieldwork also assisted in pinpointing the location of several landscape features that could not be accurately located through documentation. Moreover, there were certain features that were not discovered during the background research phase that were found during walkovers of the EHD. The comparison of past and present conditions also helped to determine if surviving landscape characteristics and features had integrity and, if so, if they should be considered significant in accordance with the NRHP eligibility criteria (see below).

Following the determinations of integrity and NRHP significance for the surviving landscape characteristics and features, staff sought to define proposed cultural landscape areas or zones within the EHD. Due to the nature and location of the landscape characteristics and features in the EHD, however, it was felt that the District essentially was a single landscape management zone and that division into smaller areas or zones was not necessary (see further discussion in Chapter IV).

The final step in the cultural and historic landscape assessment entailed a look at the seven draft alternatives proposed for impact analysis under the EIS process. This evaluation was undertaken to determine if the findings of the landscape assessment would affect and/or alter any of the proposed alternatives. TRC and TN&A staff deduced that because most of the identified landscape characteristics and features would remain in place under six of the alternatives—Alternative A calls for removal of all manmade features at ground level or above in the EHD unless natural resource degradation would occur—none of the alternatives would have to be changed or eliminated in the EIS process. This information was presented to GRSM staff at a meeting on January 26, 2004 (see Chapter IV for further discussion).

### ***NRHP ELIGIBILITY CRITERIA***

According to 36 CFR 60.4, cultural resources that are eligible for the NRHP include buildings, structures, objects, sites, and districts that retain integrity of location, design, setting, materials, workmanship, feeling, and association, and also meet one or more of the criteria outlined below. Criterion D is most often (but not exclusively) associated with archaeological resources.

- *Criterion A (Event)*. Association with one or more events that have made a significant contribution to the broad patterns of national, state, or local history.
- *Criterion B (Person)*. Association with the lives of persons significant in the past.
- *Criterion C (Design/Construction)*. Embodiment of distinctive characteristics of a type, period, or method of construction; or representation of the work of a master; or possession of high artistic values; or representation of a significant and distinguishable entity whose components may lack individual distinction.
- *Criterion D (Information Potential)*. Properties that yield (or are likely to yield) information important in prehistory or history.

### III. SITE HISTORY

#### INTRODUCTION

The EHD includes landscape features directly tied to individual buildings and structures, such as stone walls and planters at the cabins, along with characteristics and features found District-wide, such as watercourses and roads. The characteristics and features can be divided into two main groups. The first group includes those characteristics and features that are indicative of both natural and human-influenced processes, such as spatial organization, natural systems and features, and land use. The second group includes those characteristics and features that are evident as physical forms on the landscape, such as circulation, topography, vegetation, buildings and structures, small-scale features, and views and vistas. Like the landscape processes, some of the physical forms are natural in origin, while others are human-influenced.<sup>2</sup>

#### Spatial Organization

The spatial organization of the EHD has been determined by several of the processes and physical forms noted below. For example, natural systems and features, as well as topography and vegetation, have dictated in large part how the landscape developed over time and how humans reacted to the natural conditions they encountered. Choices about land use have greatly affected the appearance of the landscape over time. Finally, circulation patterns, heavily influenced by natural features, have played a major role in determining how the area developed, especially in the late nineteenth and early twentieth centuries.

#### Natural Systems and Features

Natural systems and features in the EHD include the water resources, i.e., the rivers and streams. The District is drained by the Little River and its tributaries, which include Jakes Creek and Slick Limb, Catron, Mids, Pine Knot, Tulip, and Bearwallow branches.

#### Land Use

The history of land use in the EHD—particularly the impact of the Little River Lumber Company on the birth and development of the Appalachian and Wonderland clubs, and then in turn the impact of those organizations on the development of the Great Smoky Mountains National Park—is addressed in detail in the cultural resources baseline report prepared by TRC.<sup>3</sup>

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<sup>2</sup> The landscape terminology used in this chapter is taken from the following sources: Birnbaum, Charles A., and Christine Capella Peters (editors). *The Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes*. U.S. Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services, Historic Landscape Initiative, Washington, D.C., 1996; Keller, J. Timothy, and Genevieve P. Keller. *National Register Bulletin 18: How to Evaluate and Nominate Designed Historic Landscapes*. U.S. Government Printing Office, Washington, D.C., 1994; McClelland, Linda Flint, J. Timothy Keller, Genevieve P. Keller, and Robert Z. Melnick. *National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic Landscapes*. U.S. Government Printing Office, Washington, D.C., n.d.

<sup>3</sup> Cleveland et al. 2002. A copy of the report can be viewed online at <http://www.elkmont-gmpa-ea.com/BaselineRept.html>.

### **Circulation**

The roads and trails in the EHD are the means of circulation in and through the area. They functioned that way historically and continue to do so today. Former railroad corridors gave way to automobile roads, some of which over time gave way to recreational trails. These corridors—the entry road off Route 73, known as the Elkmont Road or the Elkmont Spur, Jakes Creek Road, Little River Road/Trail, and the road behind the Wonderland Hotel and through the Wonderland cabins—brought people into the area and formed the spines around which the Appalachian and Wonderland clubs developed. This linear pattern of development was in large part imposed by the area’s topography, but it also was dictated by the location of lots sold by the Little River Lumber Company, as well as the proximity of Elkmont town and the logging railroad.

### **Topography and Vegetation**

The ruggedness of the terrain and the density of the forest played a major role in determining how the area developed—first as a logging operation and then as a resort community. Human decisions regarding access, circulation, and development options had to be analyzed in terms of the constraints imposed by the area’s natural conditions. The resulting layouts of the Appalachian and Wonderland clubs—even the designs of the individual buildings—were greatly influenced by the area’s natural environment, as well as by manmade constraints, such as lot location, lot size, and proximity to the logging operations.

### **Water Features**

As humans interacted with the natural environment of the District, they sought ways to harness the area’s natural watercourses to meet their needs. Dams at the Little River and its tributaries provided swimming holes and lakes for recreation. Tub mills utilized the power of flowing water to grind cornmeal and flour, and power plants did the same to produce electricity. Springheads and cisterns provided sources of clean water for drinking and cooking. Even the indoor plumbing found throughout the Appalachian and Wonderland clubs constituted a manmade means of utilizing the area’s natural water resources.

### **Buildings and Structures**

Both by design and necessity, the cabins in the Appalachian and Wonderland clubs were arranged in certain groupings. The narrowness of the landform between Jakes Creek and Bearallow Branch or between Jakes Creek and the foot of the ridge to the east (in the Society Hill section) necessitated that buildings be built up on the central road, as well as close to Jakes Creek in a number of instances. Until 1926, the “road” along Jakes Creek consisted of an unpaved dirt or gravel road paralleling the logging railroad tracks. In 1926, the Little River Lumber Company removed the rails when it ceased logging operations in the area, and the railroad right-of-way with the wood ties still intact became the road. In 1933–1934, the road was improved by the Civilian Conservation Corps (CCC) and covered with

crushed stone.<sup>4</sup> Lot location and size also played a major role in determining the placement of individual buildings.

Visual inspection of the club areas indicates that the cabins observed a uniform setback from the road (or railroad in many cases), and this is certainly evident in the Daisy Town section of the Appalachian Club. This is even apparent as one moves south in the Appalachian Club area to the Society Hill section. Along the Little River in the Millionaires' Row section, available building land was more plentiful, so cabin owners did not have to build right up to the former rail right-of-way (now a trail). A good example is the Spence Cabin, which is hidden from the trail and instead is oriented to the river. The Faust Cabin also is more aligned with Bearwallow Branch than with the trail. Only at the Murphy and Cambier cabins is there an orientation to the former rail right-of-way—most likely due to the narrowness of the landform there between the river and the ridge to the south. At the Wonderland Club, some cabins were constructed right up to the central access road because of the narrowness of the ridgetop in that particular area. Yet those cabins close to the road usually had a ridgetop view as well.

### Small-Scale Features

Most small-scale features within the EHD are located at individual cabins and buildings. Such features include stone walls along roads, stone retaining walls, stone property boundary walls, dry laid stone walls enclosing paths or yards, stones used to line walks or paths, and property or yard fences built of wood, steel, and wire. Other small-scale features include stone entry steps, mortared stone gate posts and entry walls, and stone patios. Stone planters can be found at many of the cabins. Other small-scale features are scattered throughout the District and are not tied to a specific cabin or building. These include stone-faced culverts, used to carry the various streams and branches in the District beneath the roads. Examples of such culverts can be found along Catron and Bearwallow branches.

### Views and Vistas

Historically, the views and vistas within the District were much more abundant and panoramic, as clear-cutting from logging and limited agriculture had “opened up” the landscape. In time, the forest returned, resulting in the landscape presently in place. Accordingly, most current views and vistas are axial in nature, concentrated along roads, trails, and watercourses. Most of these are historic, dating to the resort era or even earlier, as some of the road views follow even earlier railroad views. Partial panoramic views are available at a few high elevation spots in the District: from the Wonderland Hotel porch looking southwest; from Wonderland Cabins 58-4d through 58-9i looking southeast to southwest; from the pre-GRSM water tank area near the Kuhlman Cabin looking west-northwest; and from the GRSM horse barn pasture looking in all directions. These are partial panoramic views because the forest growth has obscured the once open spaces within the EHD, leaving only the more distant views of ridgelines and mountaintops beyond the

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<sup>4</sup> Blythe, Robert W, *Great Smoky Mountains National Park, Park Development Historic District* (listing pending, draft National Register of Historic Places Registration Form on file at Great Smoky Mountains National Park, Gatlinburg, Tennessee, n.d.): 8:16; Maher, Cornelius, and Michael Kelleher, *Great Smoky Mountains National Park Roads & Bridges, Little River Road* (Historic American Engineering Record written historical and descriptive data, HAER No. TN-35-C, available at <http://memory.loc.gov/ammem/hhquery.html>, 1996): 12–14; Schmidt, Ronald G., and William S. Hooks, *Whistle Over the Mountains: Timber, Track & Trails in the Tennessee Smokies* (Yellow Springs, Ohio: Graphicom Press, 1994): 75.

## ***DISCUSSION OF PERIOD MAPS***

### **Map 1. 1880s–1907: Pre-Commercial Logging**

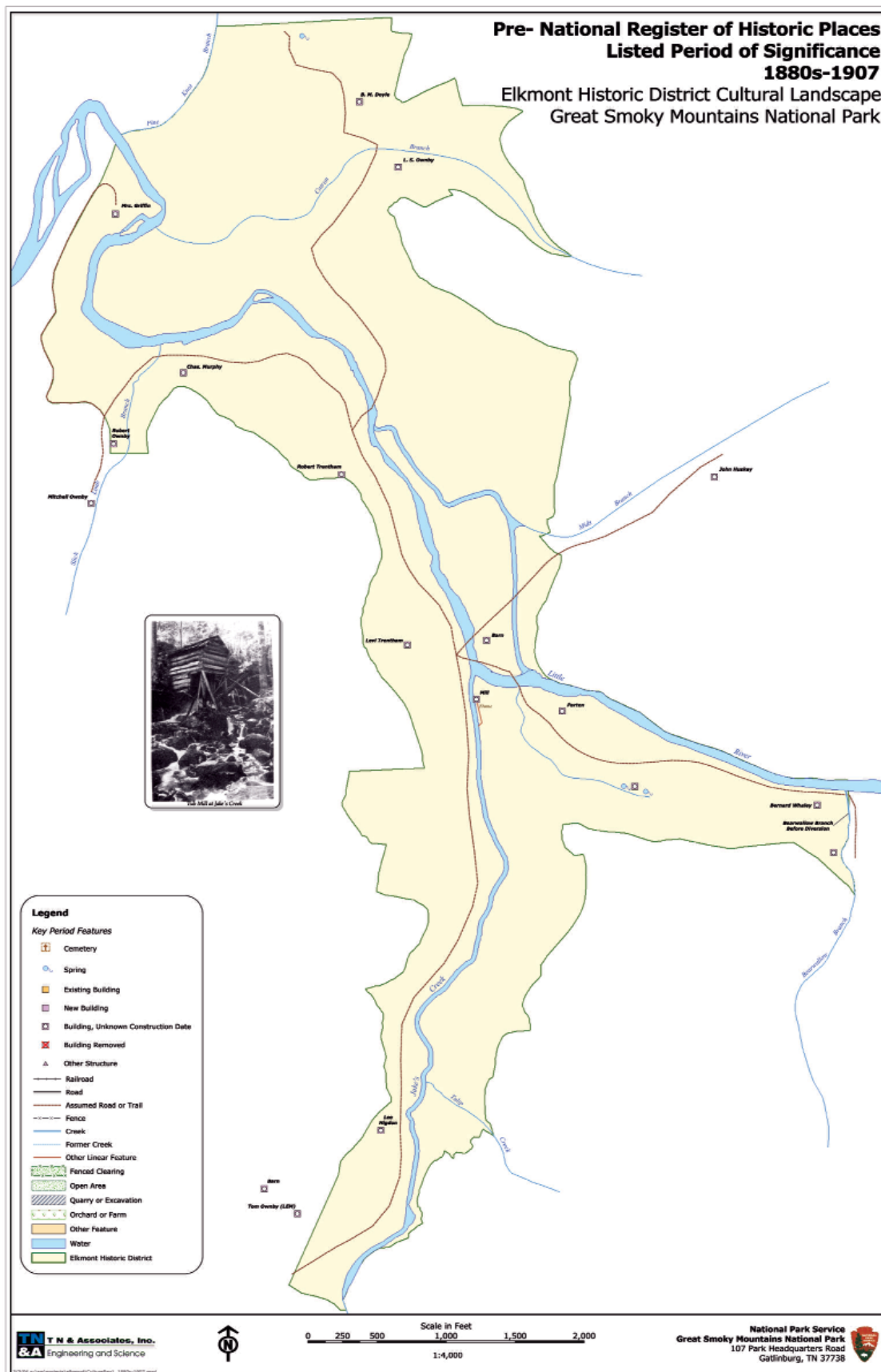
**Table 2. Historical Chronology: 1880s–1907.**

Date(s)	Event(s)
	Swaggerty and Eubanks selectively logging East Fork (upper Jakes Creek/Blanket Mountain area) using portable sawmill; J.L. English Company selectively logging Blanket Creek area; other locals working in other parts of Little River watershed
1900	W.B. Townsend of Pennsylvania visits area with associates to inspect forest; group forms Little River Lumber Company (LRLC)
1901	Little River Railroad (LRRR) is chartered
1902	Logging by LRLC begins along West Fork of Little River
1903	LRLC's first mill at Townsend begins operations
1906	LRRR starts building East Fork line

Sources: Cleveland et al. 2002:29; Dykeman and Stokely 1984:97; Schmidt and Hooks 1994:4–5, 8, 10, 12, 16, 56.



Figure 1. Pre-National Register of Historic Places Listed Period of Significance: 1880s–1907 (Elkmont Historic District cultural and historic landscape map, courtesy TM&A).





**Spatial organization:**

- Little River and Jakes Creek formed primary spines through area
- Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches formed secondary spines
- Steep slopes and ridges paralleled watercourses for much of their length
- Homesteads and farmsteads with associated cleared land were located on flat areas adjacent to watercourses
- Forest covered majority of area

**Natural systems and features:**

- Area watercourses: Little River, Jakes Creek, and Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches; also natural springs

**Land use:**

- Agriculture, domestic, industry (tub mill), and logging (in the vicinity)

**Circulation:**

- Assumed trails or roads ran through area, likely paralleling watercourses

**Topography and vegetation:**

- Little River and Jakes Creek were bordered by flat areas that quickly rose to steep slopes
- Steep slopes were cut by branches that flowed down from higher elevations
- Area included native trees and plants as well as crops grown by pioneers (corn and grains)

**Water features:**

- Levi Trentham's tub mill and flume were located at confluence of Jakes Creek and Little River<sup>5</sup>

**Buildings and structures:**

- Pioneer cabins of log construction (typical of time period and area)
- Frame barns and other agricultural outbuildings<sup>6</sup>
- Trentham's tub mill

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<sup>5</sup> Source: Photograph: "Primitive watermill on Jake's Creek of Little River, on the property of Little River Lumber Company" in *Journal of the Tennessee Academy of Science* (GSMNP 1:2, 1926) (GRSM Archives, Publications file, I-17); photograph: "Flume leading to old Trentham mill, Appalachian Club, Elkmont, Tenn." (n.d.) (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32910).

<sup>6</sup> Source: Photograph: "The road up through Elkmont, circa 1918. Approximate location of present drive between walk-in Section A and regular Section A of campground. Barn in center background, Whaley barn. Burned during World War I" (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32179).

## APPENDIX B

### Small-scale features:

- Wood flume that led to Trentham's tub mill
- Assumed footbridges crossed Little River, Jakes Creek, and various branches

### Views and vistas:

- No identified views and vistas, but it is assumed that axial views were located along watercourses and trails or roads and that panoramic views possibly existed at cleared areas near cabins

Of the landscape characteristics and features noted above, the following have survived to the present time:

- Spatial organization (without pioneer homesteads and farmsteads and with successional forest in place)
- Natural systems and features
- Topography
- Levi Trentham's cabin (relocated to rear of Cabin 7 in Daisy Town in 1932; chimney base still visible in current campground)<sup>7</sup>
- Axial views along watercourses

### **Map 2. 1908–1913: Establishment of Elkmont Town, Little River Railroad, Appalachian Club (Parts of Daisy Town and Society Hill), and Wonderland Hotel**

This map illustrates the time period of 1908–1913, when the Little River Lumber Company established its logging town of Elkmont and completed its Little River Railroad line to the area (Figure 2). It also includes the establishment of the Appalachian Club Hotel and the building of a clubhouse and cabins in the Daisy Town and Society Hill sections. The Wonderland Hotel was constructed near the end of the period. The specific events of the time period are listed in

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<sup>7</sup> Dickinson, Eleanor, *Elkmont Community Historic District* (National Register of Historic Places Registration Form [not official version used for listing], on file at Great Smoky Mountains National Park, Gatlinburg, Tennessee, 1993): 7:6.

Figure 2. National Register of Historic Places Listed Period of Significance: 1908–1942; Sub-period 1908–1913 (Elkmont Historic District cultural and historic landscape map, courtesy TM&A).

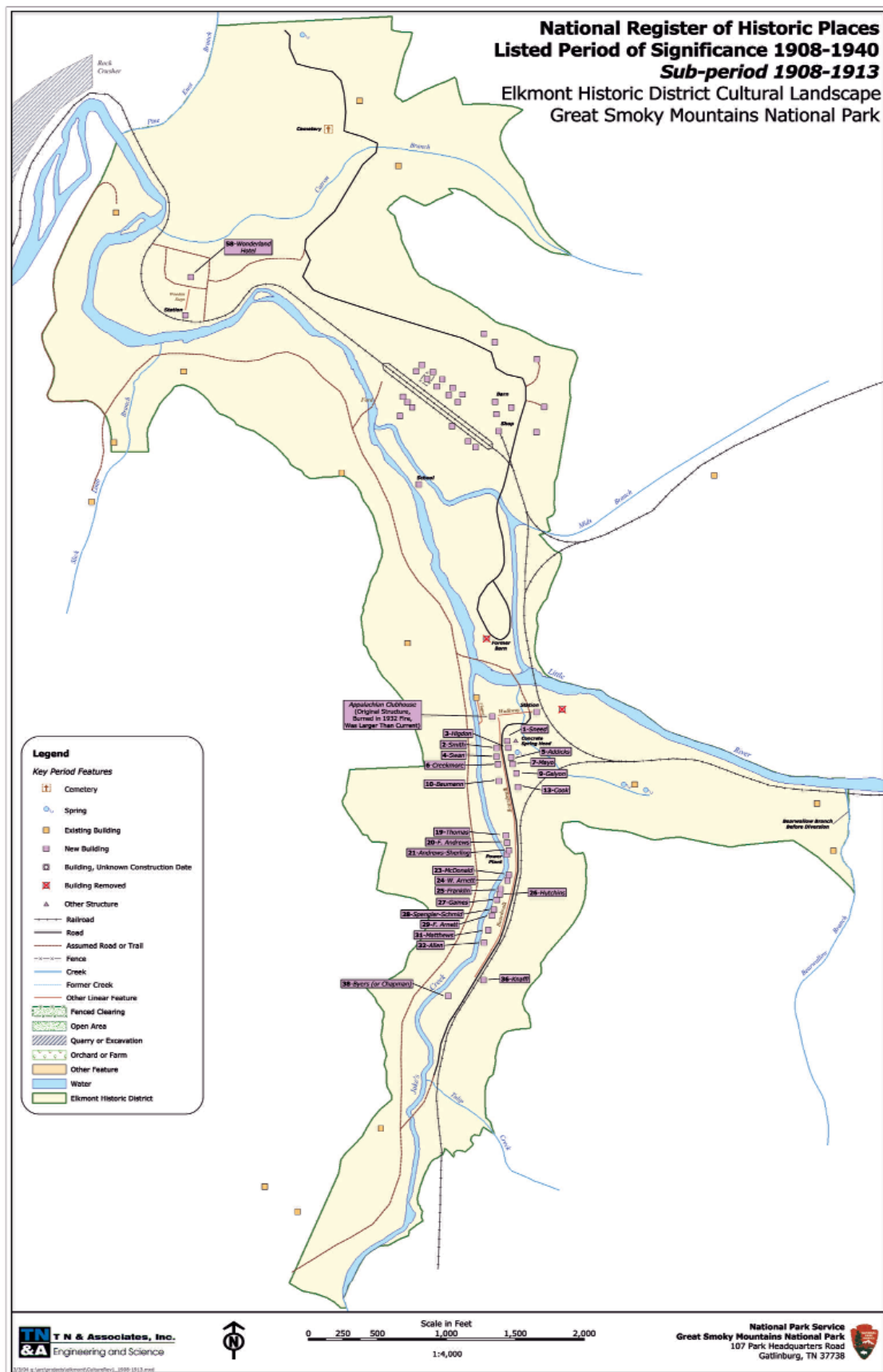




Table 3. Human interaction with the natural landscape consisted of pioneer homesteads and farmsteads scattered throughout the District (although some began to be removed); rail lines paralleling the Little River, Mids Branch, and Jakes Creek; established roads and assumed trails or roads through the area; the beginning of large-scale commercial logging in the area; and nodes of development at the Wonderland Hotel, Elkmont Town, and the Appalachian Club. It also was during this period that daily excursion train service to and from Elkmont began.

**Table 3. Historical Chronology: 1908–1913.**

Date(s)	Event(s)
1908	LRLC completes lumber camp at Elkmont; LRRR completes line to Elkmont; LRLC starts logging Mids Branch; Elkmont railroad station likely built along with town
1908– ca. 1912	Elkmont Hotel is constructed; first Elkmont school is constructed (removed at unknown date, but certainly by 1942)
1909	LRLC/LRRR opens access to Jakes Creek; peak year of timber production in Appalachians; daily excursion train service to/from Elkmont begins; Elkmont company store/post office opens
1910	LRLC deeds 50 acres +/- to Appalachian Club for purpose of building clubhouse and cabins (tract lies between Jakes Creek, Jakes Creek spur line, [Tulip] Poplar Branch, the Little River, and the Little River rail line); LRLC leases 40,000 acres to Appalachian Club for hunting and fishing (East Fork watershed above Elkmont); two-story Appalachian Club Hotel is built on site of current Appalachian Clubhouse with wide steps reaching from porch down to level of Bearwallow Branch; Old Elkmont Cemetery is established; Appalachian Club railroad station likely built along with hotel
Ca. 1910	Cabins 1–5, 6, 7, 9, 10, 19, 20, 23, 27, 29, 31, 32, and 36 are built; unpaved road through Society Hill is likely built (located west of rail line in current front yards of cabins; road likely was reclaimed by cabin owners for front yard space when LRRR removed rails from Jakes Creek spur line in 1925, and former railbed began to be used as road); raised wood boardwalk along west side of Daisy Town and Society Hill road is constructed (ran between Appalachian Club Hotel and Cabin 36; wood boardwalk was replaced with gravel path with wood sides by ca. 1928, because wood surface became too moist and slippery as tree canopy reestablished itself)
Ca. 1910– 1913	Elkmont Baptist Church is constructed; power plant is built along Jakes Creek in Society Hill section
1911	LRLC deeds 65 acres to Carter brothers for Wonderland Park development
1912	Wonderland Park Hotel is built; Wonderland Park railroad station likely constructed at same time
Ca. 1912	Cabins 13, 21, 24, 26, 28, and 38 are built; spring at base of slope east of Appalachian Club Hotel is being utilized (accessed via at least two wood staircases from Daisy Town)
1913	Cabins 25 and 58-4d are built; LRLC deeds land to Appalachian Club for playground and swimming pool with dam; LRLC deeds 823.6 acres to Carter brothers for Wonderland Park Addition; Appalachian Club Hotel Annex with 16 rooms is built (known as The Mac-Ever-Son or McEverson Apartments)

## APPENDIX B

Sources: Appalachian Club, Inc. ca. 1928; Cleveland et al. 2002:30; Dickinson 1993:7:15, 9:37; Dickinson 2003; Dykeman and Stokely 1984:99; Morrell 1976:2, 3, 15; Schmidt and Hooks 1994:34, 56, 62; Weals 1991:43.

### **Spatial organization:**

- Little River and Jakes Creek formed primary spines through area
- Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches formed secondary spines
- Steep slopes and ridges paralleled watercourses for much of their length
- Homesteads and farmsteads with associated cleared land were located on flat areas adjacent to watercourses (although some began to be removed during this period)
- Forest was cleared throughout much of area
- Nodes of development were established at north end of EHD (Wonderland Park Hotel), center of EHD (Elkmont Town), and center to south end of EHD (Appalachian Club); for most part, these nodes were located on flat areas adjacent to Little River and Jakes Creek

### **Natural systems and features:**

- Area watercourses: Little River, Jakes Creek, and Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches; also natural springs

### **Land use:**

- Agriculture, cemetery, commerce (hotels and store/post office), domestic (pioneer cabins, resort cabins, and hotels), education, industry (tub mill, power plant at Jakes Creek, and rail shop), logging, transportation

### **Circulation:**

- Assumed trails or roads ran through area from pioneer times, likely paralleling watercourses
- LRRR tracks paralleled Little River, with spur lines up Mids Branch and Jakes Creek (notable features included triple siding at Elkmont Town and wye [fork] at Mids Branch)
- Roads ran from north of cemetery to Elkmont Town, and from Appalachian Club station up Jakes Creek spur line<sup>8</sup>

### **Topography and vegetation:**

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<sup>8</sup> Source: Photograph: unidentified view of Elkmont, most likely Society Hill area looking north-northeast, showing unpaved road in front of cabins to west of railroad line (pre-World War I) (collection of Charlotte Burdette).

- Little River and Jakes Creek were bordered by flat areas that quickly rose to steep slopes
- Steep slopes were cut by branches that flowed down from higher elevations
- Area lost many native trees and plants due to logging, resulting in denuded landscape (although trees were retained at lower elevations near developed areas [Wonderland Park Hotel, Elkmont Town, and Appalachian Club])<sup>9</sup>
- Crops were grown by pioneers (corn and grains)
- Likely some exotic plant species were introduced at hotels and Appalachian Club cabins

**Water features:**

- Levi Trentham's tub mill and flume were located at confluence of Jakes Creek and Little River
- Stone or concrete spring head was built at Bearwallow Branch down slope from Daisy Town cabins<sup>10</sup>
- Concrete power plant was constructed at Jakes Creek in Society Hill section

**Buildings and structures:**

- Pioneer cabins of log construction (typical of time period and area)
- Frame barns and other agricultural outbuildings
- Trentham's tub mill
- Wonderland Park Hotel and railroad station<sup>11</sup>
- Elkmont Town buildings and structures (dwellings, hotel, store/post office, railroad station, school, and rail shop)<sup>12</sup>
- Appalachian Club Hotel, Annex, and railroad station<sup>13</sup>

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<sup>9</sup> Source: Photograph: "Above Elkmont" (view of logging; n.d.) (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32709); photograph: unidentified views labeled "logging" (ca. 1917) (collection of Bill Lawhorn); photograph: "1912 or 1913" (view of Elkmont Town looking south; may date to ca. 1910–1912) (Old Elkmont Town Walk notebook, EM-138, and Photo files III-L-17827, GRSM Archives); photograph: "Looking toward Wonderland area circa 1910 from Elkmont. Houses on right located in lower end of walk-in campgrounds, Section A" (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32718); photograph: "A 1912 Sunday School picnic special passenger train, with engine #110, poses at Elkmont" (in front of Wonderland Hotel) (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32904).

<sup>10</sup> Source: Photograph: "Appalachian Club men at spring" (June 1914) (collection of Eleanor Dickinson).

<sup>11</sup> Source: Photograph: "Wonderland Hotel. Railroad tracks running along base of hill in front. Copied from advertising brochure" (n.d.) (GRSM Archives, Photos, III-L-17827).

<sup>12</sup> Source: Photograph: "Elkmont 1916" (view of Elkmont Town looking north) (Old Elkmont Town Walk notebook, EM-79, GRSM Archives); photograph: "Elkmont, 1917–1918" (view of Elkmont Town looking northwest) (Old Elkmont Town Walk notebook, EM-112, GRSM Archives); photograph: "Elkmont 1917–1918" (view of Elkmont Town looking north) (Old Elkmont Town Walk notebook, EM-137, GRSM Archives); photograph: "Elkmont post office" (n.d.) (collection of Eleanor Dickinson).

## APPENDIX B

- Appalachian Club cabins (Daisy Town and Society Hill)<sup>14</sup>

### Small-scale features:

- Wood steps that connected railroad station to Wonderland Park Hotel
- Wood flume that led to Trentham's tub mill
- Walkway that connected railroad station to Appalachian Club Hotel
- Stone or concrete springhead at Bearwallow Branch (Daisy Town)
- Concrete power plant at Jakes Creek (Society Hill)
- Wood boardwalk that ran from Society Hill (Cabin 36) to Appalachian Club Hotel<sup>15</sup>
- Assumed footbridges crossed Little River, Jakes Creek, and various branches

### Views and vistas:

- Axial views were located along watercourses, trails, roads, and railroad lines
- Panoramic views were available in several locations due to clearcutting of much of forest: at Wonderland Park Hotel, within Elkmont Town, and within Appalachian Club
- Panoramic views possibly existed at cleared areas near pioneer cabins (especially following clearcutting of forest)

Of the landscape characteristics and features noted above, the following have survived to the present time:

- Spatial organization (without pioneer homesteads and farmsteads, without Elkmont Town, and with successional forest in place)
- Natural systems and features
- Land use (cemetery)
- Circulation (trail still marks location of road from Old Elkmont Cemetery to Elkmont Town)
- Topography

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<sup>13</sup> Source: Photograph: "Depot of Appalachian Club, 1915" (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32820); photograph: "Annual 4<sup>th</sup> of July Picnic at Clubhouse" (1914) (collection of Eleanor Dickinson); photograph: "Card room, Appalachian Club, Elkmont, Tennessee" (color postcard; n.d.) (collection of Eleanor Dickinson); photograph: "Appalachian Club group" (view of porch of hotel; ca. 1917) (collection of Eleanor Dickinson).

<sup>14</sup> Source: Photograph: "Wild Rose Cabin" (Cabin 1; n.d.) (collection of Eleanor Dickinson); photograph: "Mrs. Lillian Davison, porch of 'Lafalittle' cottage at Elkmont, with her grandchildren, Lillian Webster and Frank Webster, Jr." (Cabin 26; n.d.) (GRSM Archives, Lumbering Negatives, Small Pictures, III-L-17805); photograph: "Andrews Cabin built by Avents" (Cabin 20; 1910) (collection of Mayna Avent Nance); photograph: "Keener Cabin" (Cabin 31; pre-World War I) (collection of Charlotte Burdette); photograph: "Woodward Cottage [Walnut Lodge]" (Cabin 18; June 1914) (collection of Eleanor Dickinson).

<sup>15</sup> Source: Photograph: "Hommel Cottages?" (view of wood boardwalk; n.d.) (collection of Eleanor Dickinson); photograph: "Walter Atkins Van Gilder, Cabin #6, 'Dear Lodge,' with dog 'Buddy'" (view of gravel boardwalk; 1924) (collection of Eleanor Dickinson).

- Vegetation (exotic plant species)
- Water features (spring head at Bearwallow Branch and power plant base at Jakes Creek)
- Levi Trentham's cabin (relocated to the rear of the Mayo Cabin in Daisy Town in 1932); Wonderland Hotel; Appalachian Club cabins
- Small-scale features (concrete spring head at Bearwallow Branch and base of power plant at Jakes Creek)
- Axial views along watercourses; partial panoramic views at Wonderland Hotel and near Cabin 40 in Appalachian Club

**Map 3. 1914–1924: Establishment of Wonderland Club, First Road from Outside, Boy Scout Camp, and Hommel Orchard**

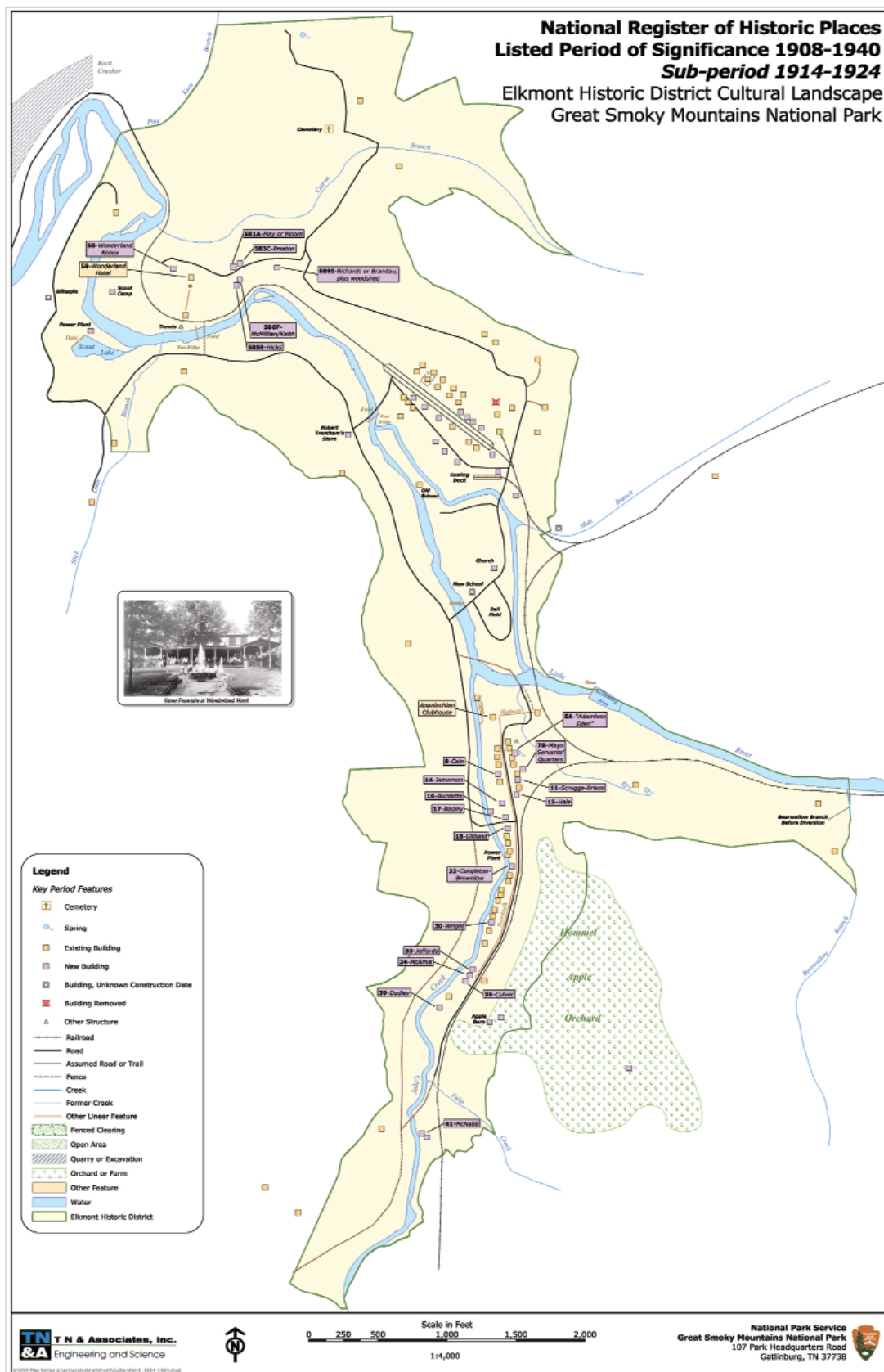
This map illustrates the time period of 1914–1924, when the Wonderland Park Hotel was sold and renamed the Wonderland Club. The first road to reach Elkmont from the outside was built from Gatlinburg, and a Boy Scout camp was established across from the Wonderland Club on flat land adjacent to the Little River. Rufus S. Hommel acquired some acreage from the Little River Lumber Company and started an apple orchard in Society Hill (Figure 3). The specific events of the time period are listed in Table 4. Human interaction with the natural landscape consisted of pioneer homesteads and farmsteads scattered throughout the District; rail lines paralleling the Little River, Mids Branch, and Jakes Creek; established roads and assumed trails or roads through the area; the movement of large-scale commercial logging to points outside the area by the end of the period, allowing the forest to begin regenerating; and increased development at the Wonderland Club, Elkmont Town, and the Appalachian Club. It also was during this period that a fungus began to destroy the area's American chestnut trees, and that the National Park movement was birthed.

**Spatial organization:**

- Little River and Jakes Creek formed primary spines through area
- Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches formed secondary spines
- Steep slopes and ridges paralleled watercourses for much of their length
- Homesteads and farmsteads with associated cleared land were located on flat areas adjacent to watercourses
- Previously cut forest showed signs of regeneration by end of period
- Nodes of development at Wonderland Club, Elkmont Town, and Appalachian Club continued to grow
- New Boy Scout camp was established near Wonderland Club in flat area along Little River
- Hommel orchard was established in Society Hill area of Appalachian Club on side of steep slope



Figure 3. National Register of Historic Places Listed Period of Significance: 1908–1942; Sub-period 1914–1924 (Elkmont Historic District cultural and historic landscape map, courtesy TM&A).





**Table 4. Historical Chronology: 1914–1924.**

Date(s)	Event(s)
1914	Appalachian Club swimming pool with dam (a.k.a. swimming hole) is built; Carter brothers sell Wonderland Park Hotel and adjacent grounds and buildings to group of Knoxville citizens, who rename area Wonderland Club
Ca. 1914	Cabin 15 is built
1914–1918	World War I brings increased demand for timber and wood products; Sevier County builds wagon road from Gatlinburg to Elkmont via Fighting Creek Gap
Ca. 1915	Boy Scout Camp Helpful (?) (a.k.a. Camp Townsend) is established (lake and power plant are built across Little River from camp sometime between ca. 1915 and ca. 1927); Cabins 8, 11, and 22 are built
Ca. 1916	Cabin 18 is built
1917	Cabin 58-1a is built
1917–1921	LRLC deeds large parcel east of Jakes Creek spur line to Rufus S. Hommel, who plants apple orchard (where Cabins 36 and 37 are) and builds apple barn (now in ruins)
Ca. 1918	Cabin 58-5e is built
1918–1922	State of Tennessee relocates Fighting Creek Gap Road; also widens it to 16 feet and resurfaces it with crushed stone
1919	Appalachian Club is reconstituted as New Appalachian Club; all holdings are transferred to new club except for 49 cabins and their lots
1920	LRLC relogs upper reaches of Jakes Creek and begins logging Meigs Creek area west of Elkmont; Wonderland Hotel Annex is built
Ca. 1920	Fungus destroys American chestnut trees; Cabins 7B, 33, 34, 37, and 58-9i are built
Ca. 1921	Cabins 5A (“Adamless Eden”) and 30 are built; wide steps from porch of Appalachian Club Hotel down to Bearwallow Branch are removed sometime between 1914 and ca. 1928 and replaced with swinging log and board walkway over Bearwallow Branch; walkway connected rail station to hotel porch and likely survived into 1940s, either in original form or rebuilt following 1932 fire
1922	Fire at Blanket Mountain; Cabin 58-3c is built
Ca. 1922	Cabins 35 and 58-6f are built
1923	Mr. & Mrs. Willis P. Davis and Col. David Chapman join to establish National Park and form Great Smoky Mountains Conservation Association; John Gore, former director of Boy Scout Camp Helpful (?) (a.k.a. Camp Townsend), turns it into private Camp Le Conte for boys (camp has two buildings, 17 tent sites, and recreational areas on 10 acres; in operation until 1954); Sevier County builds vehicle bridge (wood on stone piers) across Little River in Elkmont Town (near campground site E-3; bridge removed sometime between 1942 and 1952)
Ca. 1923	Cabins 39 and 41 are built; wood steps and railings leading to Wonderland Hotel from rail station are replaced with stone steps, walls, and piers sometime between ca. 1918 and ca. 1928
1923–1924	LRLC pulls out of Meigs Creek area
Early 1920s	Second Elkmont school is in place

Sources: Cleveland et al. 2002:31, 33; Dykeman and Stokely 1984:104, 116; GSMNHA and NPS n.d.; Maher and Kelleher 1996:11; Morrell 1976:3, 6; Schmidt and Hooks 1994:78, 108; USGS 1956, 1979.

## APPENDIX B

### Natural systems and features:

- Area watercourses: Little River, Jakes Creek, and Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches; also natural springs

### Land use:

- Agriculture (pioneer settlers and Hommel orchard), cemetery, commerce (hotels, store/post office, and Robert Trentham's store), domestic (pioneer cabins, resort cabins, and hotels), education (old and new schools in Elkmont Town), industry (tub mill, power plant at Jakes Creek, power plant at Boy Scout lake, and rail facilities), logging, recreation (Boy Scout camp, tennis at Wonderland Hotel, ball field at Elkmont Town, and swimming hole at Appalachian Club), religion (church in Elkmont Town), transportation

### Circulation:

- Assumed trails or roads ran through area from pioneer times, likely paralleling watercourses; many of these were turned into established roads during period, tying west side of Little River to Elkmont Town and Appalachian Club
- LRRR tracks paralleled Little River, with spur lines up Mids Branch and Jakes Creek
- New road from Gatlinburg via Fighting Creek Gap entered Elkmont Town from north and proceeded to "island" area (where schools, church, and ball field were located) and on to west side of Little River
- New vehicle bridge across Little River in Elkmont Town; also fords and footbridges allowed passage across river<sup>16</sup>
- Road continued to run from Appalachian Club rail station up Jakes Creek spur line

### Topography and vegetation:

- Little River and Jakes Creek were bordered by flat areas that quickly rose to steep slopes
- Steep slopes were cut by branches that flowed down from higher elevations
- Native trees and plants removed by logging showed signs of regeneration by end of period, as LRLC moved to areas outside EHD; appears trees were always retained at lower elevations near developed areas (Wonderland Club, Elkmont Town, and Appalachian Club)
- Crops were grown by pioneers (corn and grains)
- Rufus Hommel grew apples at his orchard in Society Hill
- Likely some exotic plant species were introduced at hotels and Appalachian Club and Wonderland Club cabins

### Water features:

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<sup>16</sup> Source: Photograph: "Elkmont vehicle bridge showing uneven surface of old structure due to deflection between piers and abutment" (GRSM Archives, Superintendent Monthly Reports 1936-1937); photograph: "View showing deflection in old structures" (GRSM Archives, Superintendent Monthly Reports 1936-1937).

- Boy Scout lake with dam was created on west side of Little River across from scout camp; associated power plant may have been built during this period or during following period (1925–1932)<sup>17</sup>
- Appalachian Club swimming hole with dam was built in Little River<sup>18</sup>
- Levi Trentham’s tub mill and flume were located at confluence of Jakes Creek and Little River
- Stone or concrete spring head was built at Bearwallow Branch down slope from Daisy Town cabins
- Concrete power plant was constructed at Jakes Creek in Society Hill section

**Buildings and structures:**

- Pioneer cabins of log construction (typical of time period and area)
- Frame barns and other agricultural outbuildings
- Trentham’s tub mill
- Wonderland Club Hotel, Annex, and associated cabins<sup>19</sup>
- Boy Scout camp buildings<sup>20</sup>
- Elkmont Town buildings and structures (including new school, church, store, and vehicle bridge across Little River)<sup>21</sup>
- Appalachian Club cabins (including new cabins in Daisy Town and Society Hill)
- Buildings and structures associated with Hommel apple orchard

**Small-scale features:**

- Wood flume that led to Trentham’s tub mill
- New stone steps, walls, and piers at Wonderland Club Hotel; assume stone fountain built at same time<sup>22</sup>

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<sup>17</sup> Source: Photograph: “Camp Le Conte for Boys, Elkmont. Map by F.B. Kuhlman. Lake at Camp Le Conte, 1927–28” (GRSM Archives, Oversize photo files, IV-4-34993, -34994).

<sup>18</sup> Source: Photograph: “Swimming hole” (July 1914) (collection of Eleanor Dickinson).

<sup>19</sup> Source: Photograph: “Wonderland Hotel Annex” (9/9/21) (collection of Eleanor Dickinson); photograph: “The Wonderland Club Hotel” (1920s) (collection of Katherine Kuhlman).

<sup>20</sup> Source: Photographs: “Camp Townsend,” “‘Chow’ Time,” “Stayovers,” “Dave [and] Pat,” and “Breaking Camp” (ca. 1917) (collection of Bill Lawhorn).

<sup>21</sup> Source: Photograph: “Elkmont Missionary Baptist Church (built between 1912 and 1916). Moved to Wear’s Valley. Ball Park was good place for baseball, football, golf, even croquet. This “ballpark,” or play area, once occupied sections C, D, and E of campground” (Old Elkmont Town Walk notebook, GRSM Archives); photograph: “Coaling dock, Elkmont. Located just down from Mids Branch where the wye and water tank were located, circa 1915” (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32848).

<sup>22</sup> Source: Photograph: view of front of Wonderland Hotel showing operating fountain (n.d.) (collection of Julie Brown); photograph: view of stone steps at Wonderland Hotel (n.d.) (collection of Ed Thompson).

## APPENDIX B

- Tennis courts at Wonderland Club
- Earthen dam and concrete power plant at Boy Scout lake
- Stone dam at Appalachian Club swimming hole
- Swinging log and board walkway that connected rail station to Appalachian Club Hotel<sup>23</sup>
- Stone or concrete springhead at Bearwallow Branch (Daisy Town)
- Concrete power plant at Jakes Creek (Society Hill)
- Wood boardwalk that ran from Society Hill (Cabin 36) to Appalachian Club Hotel
- Footbridges across Little River and assumed footbridges across Jakes Creek and various branches<sup>24</sup>

### Views and vistas:

- Axial views were located along watercourses, trails, roads, and railroad lines
- Panoramic views were available in several locations due to clearcutting of much of forest: at Wonderland Club Hotel, Annex, and cabins; within Boy Scout camp; within Elkmont Town; at Elkmont Town ball field; within Appalachian Club; and to/from Hommel orchard<sup>25</sup>
- Panoramic views possibly still existed at cleared areas near pioneer cabins

Of the landscape characteristics and features noted above, the following have survived to the present time:

- Spatial organization (without pioneer homesteads and farmsteads, Elkmont Town, Boy Scout camp, and Hommel orchard; with successional forest in place)
- Natural systems and features
- Land use (cemetery and recreation [swimming hole])
- Circulation (trail still marks location of old road to Gatlinburg via Fighting Creek Gap)
- Topography
- Vegetation (exotic plant species)

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<sup>23</sup> Source: Photograph: "Entrance to Club House, Appalachian Club, Elkmont, Tennessee" (postcard; n.d.) (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32936).

<sup>24</sup> Source: Photograph: "Footbridge over Little River above Elkmont, 1925" (GRSM Archives, Oversize photo files, III-38-31822bl); photograph: "Foot bridge over Little River at Elkmont. Near Scenic Loop Road, 1930" (in *GSMNP* by Great Smoky Mountain Publishing Company, Knoxville, Tennessee) (GRSM Archives, Publications file I-16).

<sup>25</sup> Source: Photograph: view of vista from top of Wonderland Hotel steps (n.d.) (collection of Ed Thompson); photograph: "Elkmont looking downriver" (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32914); photograph: "A game of baseball on the open field near the church and/or school, ca. 1920" (GRSM Archives, Old Elkmont Town Walk notebook, EM-27, and Photo files, III-L-17839); photograph: "Road near Elkmont on Scenic Loop. GSMNP, "Land of Everlasting Hills." (shows view of Hommel orchard in distance; ca. 1930) (GRSM Archives, Publications file, I-15).

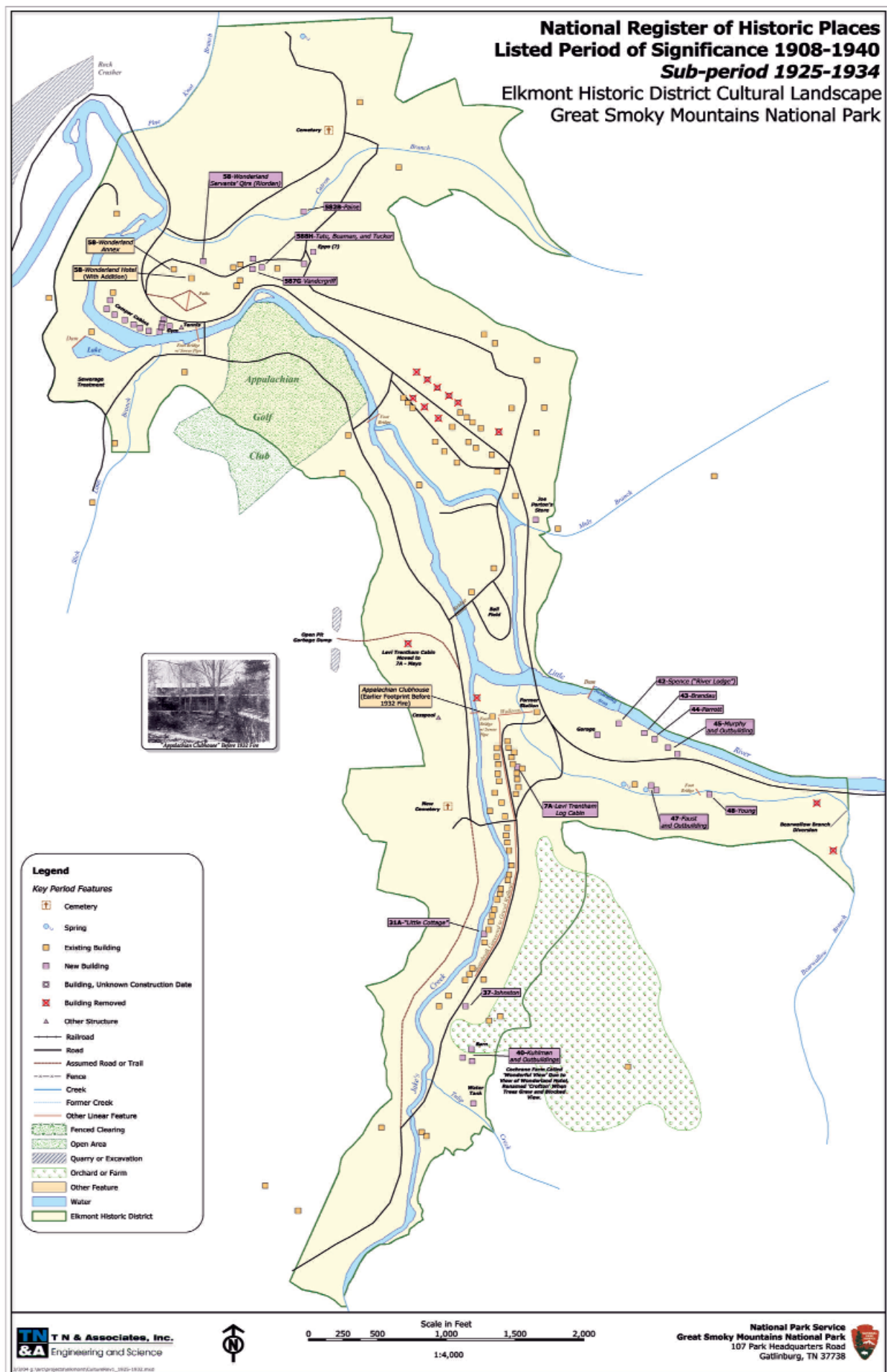
- Water features (Boy Scout lakebed, dam remnants, and base of power plant; Appalachian Club swimming hole; spring head at Bearwallow Branch; and power plant base at Jakes Creek)
- Levi Trentham's cabin (relocated to the rear of the Mayo Cabin in Daisy Town in 1932); Wonderland Hotel, Annex, and cabins; Appalachian Club cabins
- Small-scale features (Wonderland Hotel steps and fountain; remnants of scout lake dam and power plant; concrete spring head at Bearwallow Branch; and base of power plant at Jakes Creek)
- Axial views along watercourses and roads; partial panoramic views at Wonderland Hotel, at Wonderland Cabins 58-4d to 58-9i, and near Cabin 40 in Appalachian Club

**Map 4. 1925–1932: LRLC Ceases Elkmont Operations; Former LRRR Railbeds Converted to Auto Roads; Cochran Farm and Millionaires' Row Established**

This map illustrates the time period of 1925–1932, when the LRLC ended its logging operations in the Elkmont area and pulled up its tracks to use in other parts of the Smokies. Former railbeds were then transformed to automobile roads (initially with the wood ties still in the ground), allowing private automobiles to travel throughout the former LRRR network, including the Elkmont area. This period also saw the establishment of the Cochran Farm in Society Hill, and the initial development of the Millionaires' Row section of the Appalachian Club (Figure 4). The specific events of the time period are listed in Table 5. Human interaction with the natural landscape consisted of pioneer homesteads and farmsteads scattered throughout the District (although a few were removed during the period); established roads and assumed trails through the area; the cessation of large-scale commercial logging in the area and the closing down of LRLC operations in Elkmont; and increased development at the Boy Scout camp, the Wonderland Club, and the Appalachian Club. Elkmont Town decreased in size as several buildings were removed. The Little River rail line and the Mids Branch and Jakes Creek spur lines were taken up, and the railbeds were converted to auto roads (except at Mids Branch). It also was during this period that the effort to fund land acquisition for the National Park began.



Figure 4. National Register of Historic Places Listed Period of Significance: 1908–1942: Sub-period 1925–1934 (Elkmont Historic District cultural and historic landscape map, courtesy TM&A).





**Table 5. Historical Chronology: 1925–1932.**

Date(s)	Event(s)
1925	Congress authorizes groups in Tennessee and North Carolina to buy land and deed it to federal government for National Park; Tennessee legislature approves sale of LRLC land to state, which would then donate it to federal government (LRLC would get 15-year period to remove 16-inch-diameter and larger trees from Middle Fork); LRLC removes rails from Elkmont and moves base of operations to Middle Fork; Cabin 40 is built (initially named “Wonderview” or “Wonderful View,” then changed to “Crofton” when forest covers view); Rooster Williams crashes plane at Elkmont (in current campground)
Ca. 1925	Cabins 58-7g and 31A are built
1926	Groups in Tennessee and North Carolina have raised \$1 million; Tennessee and LRLC reach formal agreement on sale of LRLC land; LRLC closes Elkmont operations; LRRR beds are converted to auto roads (gravel over wood ties); Cabin 40 is turned into working farm by Alva C. Cochran, with barn, chicken house, woodshed, garage, privy, and spring (farm grew Wonderview sweet corn and operated until 1988)
Ca. 1926	Cabin 58-8h is built; garage and woodshed at Cabin 40 are built
1927	Tennessee and North Carolina legislatures contribute \$2 million each; sale between Tennessee and LRLC is finalized (title changes hands, deeds are delivered, and LRLC gets most of agreed-upon funds: \$273,557 for 76,507 acres)
1927– ca. 1932	North building of Elkmont Hotel turned into Elkmont Tavern (assume that south building removed at this time); Elkmont gas station is built
1928	John D. Rockefeller, Jr. gives \$5 million for National Park through Laura Spelman Rockefeller Memorial Fund; LRLC deeds 65 acres along Little River east of Appalachian Club to Alice U. Morier (Millionaires’ Row); Cabin 43 is constructed; New (Jakes Creek) Elkmont Cemetery is established
Ca. 1928	Cabins 42, 44, 45, 47, and 58-2b are built; Alice Morier likely had Bearwallow Branch diverted at this time (previously flowed directly into Little River via LRRR culvert; now turned and flowed parallel to river); side extension and rear wing of Wonderland Hotel are built (loop drive between hotel and annex likely established)
1928– 1931	Tennessee builds 24-foot-wide Little River Road over bed of LRRR from Townsend to Elkmont, and improves Fighting Creek Gap Road from Elkmont to Sugarlands
Ca. 1930	Cabin 48 and Servants Quarters at Wonderland Hotel are built; footbridge over Bearwallow Branch is constructed; sewer line to Wonderland Hotel and power lines to Wonderland and Appalachian clubs are in place
1930s	Appalachian Club water tanks are installed (Society Hill)
1932	Levi Trentham log cabin is moved from west side of Little River to rear of Cabin 7; Appalachian Club Hotel and Annex burn

Sources: Cleveland et al. 2002:33; Dickinson 1993:7:6, 12; Dykeman and Stokely 1984:116, 117; Maher and Kelleher 1996:12; Schmidt and Hooks 1994:16, 56, 106, 110, 114; Weals 1991:iv–v, 84–85, 87–88.

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### **Spatial organization:**

- Little River and Jakes Creek formed primary spines through area
- Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches formed secondary spines
- Bearwallow Branch was redirected near Little River to flow parallel to river
- Steep slopes and ridges paralleled watercourses for much of their length
- Homesteads and farmsteads with associated cleared land were located on flat areas adjacent to watercourses (although a few were removed during period)
- Levi Trentham's log cabin was moved from west side of Little River to Daisy Town section of Appalachian Club
- Previously cut forest showed further signs of regeneration during period
- Nodes of development at Camp Le Conte, Wonderland Club, and Appalachian Club continued to grow
- Several buildings were removed from Elkmont Town
- Millionaires' Row section of Appalachian Club was established
- Working farm (Cochran) was established at Cabin 40 in Society Hill, adjacent to Hommel apple orchard
- Sewer line to Wonderland Club and power lines to Appalachian and Wonderland clubs were installed; water tanks were built for Appalachian Club; open pit garbage dump for Appalachian Club was built 0.2 miles northwest of Daisy Town (outside EHD); cesspool for Appalachian Club was built roughly 400 feet west of Daisy Town (within EHD)
- Appalachian Club Hotel and Annex burned

### **Natural systems and features:**

- Area watercourses: Little River, Jakes Creek, and Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches; also natural springs
- Bearwallow Branch was diverted from Little River and redirected east to flow parallel to river and rejoin it farther downstream; allowed Bearwallow Branch to flow adjacent to Cabins 47 and 48 in Millionaires' Row section

### **Land use:**

- Agriculture (pioneer settlers, Hommel orchard, and Cochran farm), cemetery (Old and New Elkmont cemeteries), commerce (Wonderland Hotel, Elkmont Tavern, gas station, store/post office, and Trentham and Parton stores), domestic (pioneer cabins, camp cabins, resort cabins, and hotels), education (old and new schools in Elkmont Town), industry (power plants at Jakes Creek and camp lake), recreation (camp, tennis at Wonderland Hotel, Appalachian Golf Club near Wonderland Club, ball field at Elkmont Town, and swimming hole at Appalachian Club), religion (church in Elkmont Town), transportation

### **Circulation:**

- Assumed trails or roads ran through area from pioneer times, likely paralleling watercourses; most of these were already established roads by this period
- With removal of LRRR tracks, former rail corridors were converted to automobile roads (except up Mids Branch); allowed access to all parts of EHD<sup>26</sup>
- Elkmont now accessible from outside via road from Townsend or via Fighting Creek Gap Road from Gatlinburg
- New roads built throughout EHD during period: access road to Old Elkmont Cemetery; access drive from main road up to rear of Wonderland Hotel and Annex; loop road at Daisy Town and Appalachian Club Hotel; access road to New Elkmont Cemetery
- With removal of Jakes Creek spur line, road now followed former rail corridor; former unpaved road paralleling spur line to west was removed, and land was “returned” to front yards of cabins along Jakes Creek
- Existing bridges, fords, and footbridges continued to be used

**Topography and vegetation:**

- Little River and Jakes Creek were bordered by flat areas that quickly rose to steep slopes
- Steep slopes were cut by branches that flowed down from higher elevations
- Native trees and plants removed by logging were now regenerating
- Crops were grown by pioneers and Alva Cochran (corn and grains)
- Rufus Hommel grew apples at his orchard in Society Hill
- Likely more exotic plant species were introduced at hotels and Appalachian Club and Wonderland Club cabins

**Water features:**

- Camp Le Conte lake with dam and power plant
- Appalachian Club swimming hole with dam
- Levi Trentham’s tub mill and flume were removed during period
- Stone or concrete spring head at Bearwallow Branch
- Concrete power plant at Jakes Creek

**Buildings and structures:**

- Pioneer cabins of log construction (typical of time period and area); Levi Trentham log cabin moved to Daisy Town
- Frame barns and other agricultural outbuildings
- Trentham’s tub mill (removed during period)

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<sup>26</sup> Source: Photograph: “Road to Elkmont after removal of tracks, drove on railroad ties. Joe Meyers stands by car, circa 1927. Photo by Laura Thornborough” (GRSM Archives, Lumbering Photos, Hooks Collection, Oversize, 32810).

## APPENDIX B

- Wonderland Club Hotel (expanded with side and rear additions), Annex, and cabins (including several new cabins; Epps Cabin may have been built in Wonderland Club area, but exact location not known)
- Camp Le Conte camp buildings (including new cabins and gym)<sup>27</sup>
- Elkmont Town buildings and structures (including new store, gas station, and tavern at former hotel)<sup>28</sup>
- Appalachian Club Hotel and Annex burned during period
- Appalachian Club cabins (including new cabins in Society Hill)
- Millionaires' Row cabins and outbuildings
- Buildings and structures associated with Hommel apple orchard
- Buildings and structures associated with Cochran farm in Society Hill
- Water tanks, cesspool, open pit garbage dump, and utility lines in Appalachian and Wonderland club areas

### Small-scale features:

- Wood flume that led to Trentham's tub mill (removed during period)
- Stone steps, walls, piers, and fountain at Wonderland Club Hotel; flanking switchback dirt paths added to sides of steps during period<sup>29</sup>
- Tennis courts at Wonderland Club
- Earthen dam and concrete power plant at camp lake
- Stone dam at Appalachian Club swimming hole
- Swinging log and board walkway that connected rail station to Appalachian Club Hotel
- Stone or concrete springhead at Bearwallow Branch (Daisy Town)
- Concrete power plant at Jakes Creek (Society Hill)
- Wood boardwalk that ran from Society Hill (Cabin 36) to Appalachian Club Hotel (converted from wood to gravel path with board sides during period)
- Stone and concrete Bearwallow Branch footbridge in Millionaires' Row section
- Footbridges across Little River and Jakes Creek and assumed footbridges across various branches

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<sup>27</sup> Source: Photograph: "Camp Le Conte. Typical front view, Cabins #1-1 through E1-12, 1955 disposal program. Photo by H. Reese Smith" (GRSM Archives, Photo files, III-B-8107); photograph: "Camp Le Conte. Side view, Building #E1-17, gymnasium, 1955 disposal program. Photo by H. Reese Smith" (GRSM Archives, Photo files, III-B-8112).

<sup>28</sup> Source: Photograph: "Old service station at Elkmont, August 1, 1939. Photo by H.O. Edwards" (GRSM Archives, Photo files, III-B-9884); photograph: view of Elkmont Tavern from road (n.d.) (collection of Julie Brown).

<sup>29</sup> Source: Photograph: view of stone steps at Wonderland Hotel (shows path at right edge of photo; n.d.) (collection of Ed Thompson).

**Views and vistas:**

- Axial views were located along watercourses, trails, roads, and railroad lines
- Panoramic views were available in several locations due to clearcutting of much of forest; however, these views were shrinking as forest regenerated: at Wonderland Club Hotel, Annex, and cabins; within camp; within Elkmont Town; at Elkmont Town ball field; within Appalachian Club; and to/from Hommel orchard and Cochran farm<sup>30</sup>
- Panoramic views possibly still existed at cleared areas near pioneer cabins

Of the landscape characteristics and features noted above, the following have survived to the present time:

- Spatial organization (without pioneer homesteads and farmsteads, Elkmont Town, Camp Le Conte, Cochran farm, and Hommel orchard; with successional forest in place)
- Natural systems and features (including redirected Bearwallow Branch)
- Land use (cemetery, recreation [swimming hole], and transportation [roads])
- Circulation (trail still marks location of old road to Gatlinburg via Fighting Creek Gap, and roads into and throughout EHD following removal of tracks still in place)
- Topography
- Vegetation (native trees and plants, exotic plant species)
- Water features (camp lakebed, dam remnants, and base of power plant; Appalachian Club swimming hole; spring head at Bearwallow Branch; and power plant base at Jakes Creek)
- Levi Trentham's cabin (relocated to the rear of the Mayo Cabin in Daisy Town in 1932); Wonderland Hotel, Annex, and cabins; Appalachian Club cabins, including those at Millionaires' Row; water tanks, utility lines, and other infrastructure
- Small-scale features (Wonderland Hotel steps, fountain, and switchback paths; remnants of Camp Le Conte lake dam and power plant; concrete spring head at Bearwallow Branch; base of power plant at Jakes Creek; and Bearwallow Branch footbridge)
- Axial views along watercourses and roads; partial panoramic views at Wonderland Hotel, at Wonderland Cabins 58-4d to 58-9i, and near Cabin 40 in Appalachian Club

**Map 5. 1933–1942: Establishment of National Park and CCC**

This map illustrates the time period of 1933–1942, when the Great Smoky Mountains National Park was established, and the CCC established its presence in the Park and at Elkmont (Figure 5). The specific events of the time period are listed in Table 6. Human interaction with the natural landscape consisted of pioneer homesteads and farmsteads

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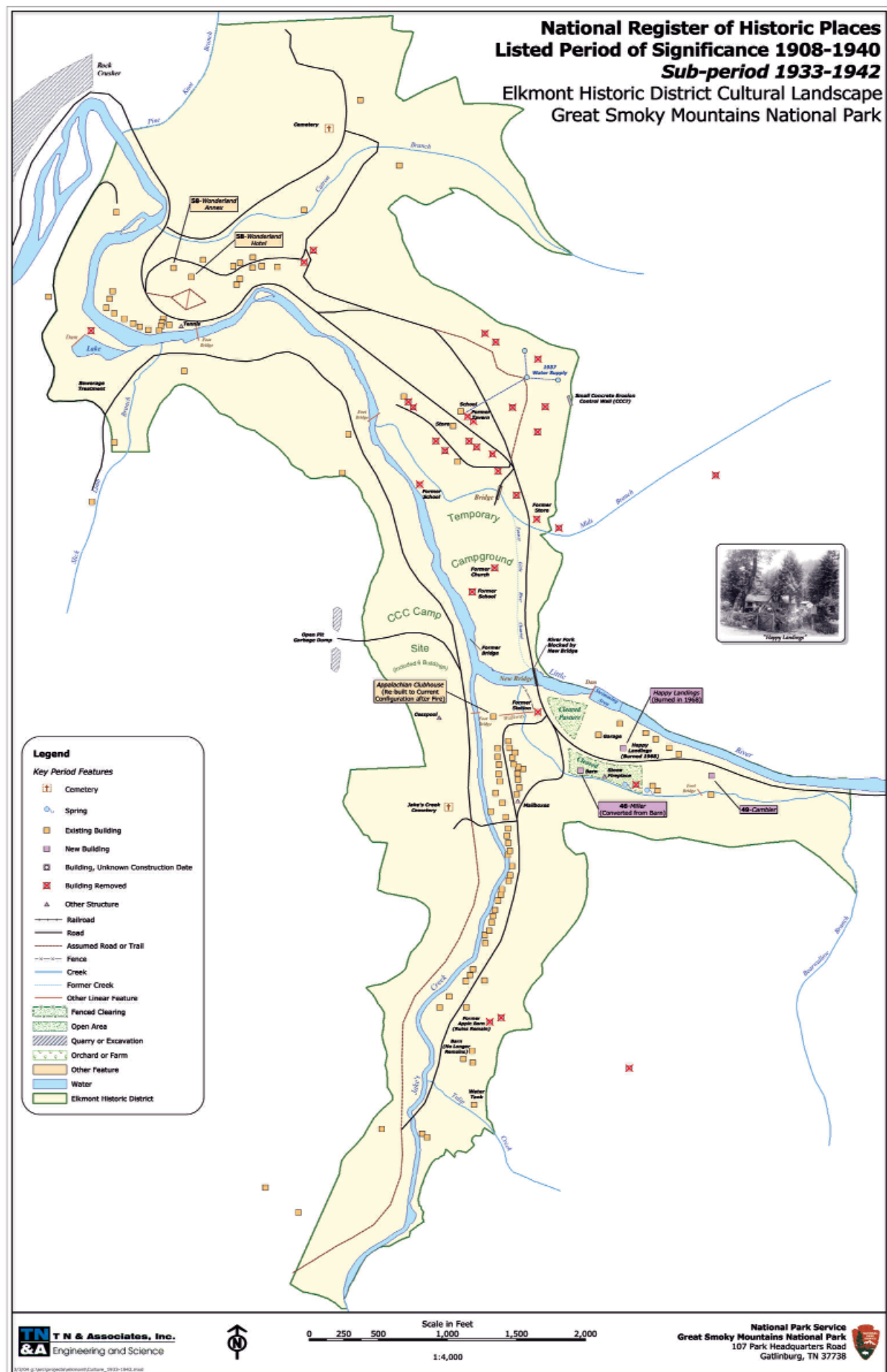
<sup>30</sup> Source: Photograph: view within Elkmont Town looking northwest, with tavern at right side of photo (n.d.) (collection of Julie Brown).

**Table 6. Historical Chronology: 1933–1942.**

Date(s)	Event(s)
1932–ca. 1936	Elkmont Tavern is removed; second Elkmont school is removed and third school is built (third school removed in ca. 1950)
1933	Federal government contributes \$2 million, bringing total for Park land acquisition to \$12 million; CCC is established by Franklin D. Roosevelt; within GRSM, CCC builds 600 miles of trails (including 70 miles of Appalachian Trail), six fire towers, and 300 miles of fire roads and tourist highways; CCC also conducts debris clean-up, reforestation, and erosion control (e.g., builds several concrete erosion control buffers in Elkmont area), and installs telephone lines throughout Park
Ca. 1933	Alice Morier’s dwelling, Happy Landings, is built (burned in 1968); Alice’s stables are built (later became Cabin 46)
1933–34	Approximately 17 CCC camps are located in Park; Elkmont Camp NP-12 (12 <sup>th</sup> camp in Park; a.k.a. Camp #1212) is established and expanded with Camp #422 two years later; Camp NP-12, with enrollees from New York and New Jersey, contains at least six buildings; U.S. Bureau of Public Roads designs and CCC improves Elkmont roads (Little River and Jakes Creek); CCC also rebuilds two wood bridges in Elkmont and resurfaces area roads with crushed stone; CCC likely builds stone-faced culverts beneath roads, as well as low stone and wood bridge over Mids Branch
1934	GRSM is established as National Park on June 15 <sup>th</sup> ; LRLC leaves Tremont area; new Appalachian Clubhouse is built at same location as original hotel and annex
1935	4,350 CCC enrollees working in Park
1936	Col. W.B. Townsend dies on February 23 <sup>rd</sup>
1936–37	CCC builds Little River stone bridge, blocking arm of Little River through Elkmont Town and thereby removing “island”; CCC walkway at Appalachian Club swimming hole likely built at this time; vehicle bridge across Little River (near campground site E-3) is likely removed at this time
1938	Elkmont Baptist Church is relocated to Wear’s Valley and renamed Valley View Church
1938–39	NPS builds new section of Little River Road from Fighting Creek Gap to Elkmont (current road)
1939	Last logs from Middle Fork reach LRLC mill in Townsend; NPS builds underground cistern and piping to Elkmont Town (located up slope to east of current campground)
1939–42	Elkmont gas station is removed
1940	Roosevelt dedicates National Park on September 2 <sup>nd</sup> at Rockefeller Memorial (Newfound Gap); land acquisition for Park is nearly complete; Cabin 49 is built
1940–44	LRLC buildings and equipment are removed and sold
1942	CCC program is terminated and all camps are closed

Sources: Dykeman and Stokely 1984:119, 121–122; Jolley 2001:7, 8, 19, 20; Jones 1996:109, 113, 124; Schmidt and Hooks 1994:16, 34, 114, 136.

Figure 5. National Register of Historic Places Listed Period of Significance: 1908–1942: Sub-period 1933–1942 (Elkmont Historic District cultural and historic landscape map, courtesy TM&A).





scattered throughout the District (although several were removed during the period); established roads and assumed trails through the area; the removal of most of the buildings and structures in Elkmont Town; the construction of a number of structures in the EHD by CCC enrollees; the erection of a new Appalachian Clubhouse; increased development along Millionaires' Row; and the closing down of the Hommel orchard. It also was during this period that a temporary campground was built in the former "island" area that today contains sections B–F of the current Elkmont Campground.

**Spatial organization:**

- Little River and Jakes Creek formed primary spines through area
- Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches formed secondary spines
- Steep slopes and ridges paralleled watercourses for much of their length
- Homesteads and farmsteads with associated cleared land were located on flat areas adjacent to watercourses (although several were removed during period)
- Previously cut forest showed further signs of regeneration during period
- Nodes of development were located at Camp Le Conte, Wonderland Club, and Appalachian Club
- Most of Elkmont Town was removed, although third school was built
- Millionaires' Row section of Appalachian Club continued to develop
- Cochran farm continued to operate in Society Hill
- Hommel orchard closed and associated buildings were removed
- Appalachian Golf Club closed
- Infrastructure remained in place; NPS added new cistern and water pipes to Elkmont Town; sewage treatment area was built up slope south of Camp Le Conte lake
- New Appalachian Clubhouse was constructed
- CCC camps were established at Elkmont on west side of Little River; enrollees worked throughout EHD and built many new structures
- Two cleared pastures were established in Millionaires' Row area
- Temporary campground was established in former "island"; branch of Little River that created island was cut off by CCC's Little River stone bridge

**Natural systems and features:**

- Area watercourses: Little River, Jakes Creek, and Bearwallow, Catron, Mids, Pine Knot, Slick Limb, and Tulip branches; also natural springs

**Land use:**

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- Agriculture (pioneer settlers and Cochran farm), cemetery (Old and New Elkmont cemeteries), commerce (Wonderland Hotel and Elkmont Town store/post office), domestic (pioneer cabins, camp cabins, resort cabins, and hotel), education (third school in Elkmont Town), government (CCC camps), industry (power plant at Jakes Creek), recreation (camp, tennis at Wonderland Hotel, swimming hole at Appalachian Club, and temporary campground), transportation

### **Circulation:**

- Assumed trails or roads ran through area from pioneer times, likely paralleling watercourses; most of these were established roads by this period
- CCC built small bridge over Mids Branch and large stone arched bridge over Little River; also improved and resurfaced area roads and rebuilt two wood bridges on Elkmont Road
- NPS built new section of Little River Road from Fighting Creek Gap to Elkmont (current alignment); now travelers could drive between Townsend and Gatlinburg without entering Elkmont
- Existing roads, bridges, fords, and footbridges continued to be used; wood vehicle bridge over Little River near current campground was removed

### **Topography and vegetation:**

- Little River and Jakes Creek were bordered by flat areas that quickly rose to steep slopes
- Steep slopes were cut by branches that flowed down from higher elevations
- Native trees and plants removed by logging were now regenerating
- Crops were grown by pioneers and Alva Cochran (corn and grains)
- Hommel orchard closed
- Likely more exotic plant species were introduced at hotel and Appalachian Club and Wonderland Club cabins

### **Water features:**

- Camp Le Conte lake with dam (power plant was closed)
- Appalachian Club swimming hole with dam
- Stone or concrete spring head at Bearwallow Branch
- Concrete power plant at Jakes Creek

### **Buildings and structures:**

- Pioneer cabins of log construction (typical of time period and area)
- Frame barns and other agricultural outbuildings
- Wonderland Club Hotel, Annex, and cabins (two cabins were removed during period)
- Camp Le Conte camp buildings

- Most of Elkmont Town buildings and structures were removed during period (including gas station, tavern, Parton's store, church, two former schools); third school built during period<sup>31</sup>
- New Appalachian Clubhouse built during period
- Appalachian Club rail station removed during period
- Two cabins and barn added to Millionaires' Row (barn later remodeled into cabin)<sup>32</sup>
- Buildings and structures associated with Hommel apple orchard were removed
- Buildings and structures associated with Cochran farm in Society Hill
- Water tanks, cesspool, open pit garbage dump, and utility lines in Appalachian and Wonderland club areas; added sewage treatment area up slope south of camp lake, and NPS built underground cistern and water piping system to Elkmont Town (located up slope east of current Campground)
- CCC camp on west side of Little River contained at least six buildings of temporary frame construction<sup>33</sup>
- CCC built smaller wood and stone bridge over Mids Branch and larger stone, multi-arched bridge over Little River<sup>34</sup>

**Small-scale features:**

- Stone steps, walls, piers, and fountain at Wonderland Club Hotel; flanking switchback dirt paths at sides of steps
- Tennis courts at Wonderland Club
- Earthen dam at camp lake (concrete power plant closed during period)
- Stone dam at Appalachian Club swimming hole; CCC added stone walkway to swimming hole during period
- CCC built stone-faced culverts to carry Pine Knot and Bearwallow branches beneath roads
- CCC built concrete erosion-control buffer walls on slopes east of Elkmont Town

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<sup>31</sup> Source: Photograph: "Elkmont schoolhouse, Elkmont, Tennessee. Old Elkmont schoolhouse, near Elkmont store, November 1949. Sold 1950. Photo by rangers" (GRSM Archives, Photo files, III-B-10825).

<sup>32</sup> Source: Photograph: "'Happy Landings,'" Home of Alice Townsend, third wife of Col. Townsend. Destroyed by fire, 1968. Photo by Bill Hooks" (n.d.) (GRSM Archives, Photo files, III-L-4738).

<sup>33</sup> Source: Photograph: "Cooks and mess boys at CCC camp, Elkmont, 1933. Copy of photo from Mrs. Isabelle Gifford, a resident of Elkmont at the time. Her mother was a laundress for the men" (GRSM Archives, Photo files, III-C-CCC-16901).

<sup>34</sup> Source: Photograph: "Footbridge at Elkmont. Rockwork done by CCC, 1935. Copied from print belonging to Marshall Fox, Waldens Creek, who worked on this bridge" (GRSM Archives, Photo files, III-C-CCC-18156); photograph: "Elkmont Vehicle Bridge. Mast in place for derrick, footer for abutment in background" (GRSM Archives, Superintendent Monthly Reports 1936-1937); photograph: "CCC enrollees at work on Elkmont bridge. Copied from print belonging to Marshall Fox, who was one of the enrollees working on this project" (GRSM Archives, Photo files, III-C-CCC-18160); photograph: "Elkmont bridge, 1938. Four span with multi-plate steel arches, masonry piers, and spandrel walls. Constructed by CCC without skilled labor. Initial design by W.A. Wilhelm" (GRSM Archives, Oversize photo files, I-8-31494a).

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- Swinging log and board walkway that connected rail station to Appalachian Club Hotel
- Stone or concrete springhead at Bearwallow Branch (Daisy Town)
- Concrete power plant at Jakes Creek (Society Hill)
- Gravel path with board sides that ran from Society Hill (Cabin 36) to Appalachian Clubhouse removed during period
- Stone and concrete Bearwallow Branch footbridge in Millionaires' Row section
- Stone fireplace or possible still built in Millionaires' Row between Cabins 46 and 47
- Footbridges across Little River and Jakes Creek and assumed footbridges across various branches

### Views and vistas:

- Axial views were located along watercourses, trails, roads, and railroad lines
- Panoramic views were available in several locations due to clearcutting of much of forest; however, these views were shrinking as forest regenerated: at Wonderland Club Hotel, Annex, and cabins; within camp; within Elkmont Town; at temporary campground; at CCC camps; within Appalachian Club; and to/from Cochran farm
- Panoramic views possibly still existed at cleared areas near pioneer cabins

Of the landscape characteristics and features noted above, the following have survived to the present time:

- Spatial organization (without pioneer homesteads and farmsteads, Elkmont Town, Camp Le Conte, Cochran farm, Hommel orchard, Appalachian Golf Club, CCC camps, and cleared pastures at Millionaires' Row; with successional forest in place)
- Natural systems and features (including loss of "island" when bridge cut off branch of Little River)
- Land use (cemetery, recreation [swimming hole and campground], and transportation [roads])
- Circulation (trail still marks location of old road to Gatlinburg via Fighting Creek Gap; road network outside and inside EHD; CCC stone bridge over Little River)
- Topography
- Vegetation (native trees and plants, exotic plant species)
- Water features (camp lakebed, dam remnants, and base of power plant; Appalachian Club swimming hole; spring head at Bearwallow Branch; and power plant base at Jakes Creek)
- Levi Trentham's cabin (relocated to the rear of the Mayo Cabin in Daisy Town in 1932); Wonderland Hotel, Annex, and cabins; Appalachian Club cabins, including those at Millionaires' Row; water tanks, utility lines, and other infrastructure (sewage treatment area and cistern with piping no longer in use)
- Small-scale features (Wonderland Hotel steps, fountain, and switchback paths; remnants of Camp Le Conte lake dam and power plant; CCC culverts and erosion

control walls; remnants of CCC walkway at swimming hole; concrete spring head at Bearwallow Branch; base of power plant at Jakes Creek; Bearwallow Branch footbridge; stone fireplace or possible still between Cabins 46 and 47)

- Axial views along watercourses and roads; partial panoramic views at Wonderland Hotel, at Wonderland Cabins 58-4d to 58-9i, and near Cabin 40 in Appalachian Club

## IV. ANALYSIS AND EVALUATION

### ***INTEGRITY AND ELIGIBILITY***

An examination of the seven qualities of integrity—location, design, setting, materials, workmanship, feeling, and association—indicates that the surviving landscape characteristics and features that defined the cultural landscape during the historic period (1880s–1942) have retained their integrity. The characteristics and features include: spatial organization, natural systems and features, land use, circulation, topography and vegetation, water features, buildings and structures, small-scale features, and views and vistas. While not all characteristics and features from each period have survived to the present, a sufficient number has survived in its original location, in a setting in keeping with the historic setting, with historic design, materials, and workmanship intact, and with a feeling and association that ties back to the historic period. Because the surviving characteristics and features are located within an NRHP-listed historic district and they retain their integrity, they are recommended contributing to the EHD. Cultural landscape features directly associated with a particular building or structure are recommended contributing to that building or structure, as well as to the District as a whole. Larger, District-wide landscape elements and smaller features not directly tied to a particular building or structure also are recommended contributing to the District.

The surviving landscape characteristics and features provide tangible links to the historic events that shaped the EHD during the historic period. While the club era is best represented by the current landscape, there are surviving features that point to each successive use of the area between the 1880s and 1942, from pioneer settlement to the CCC presence. The surviving features also showcase the architectural and engineering skills of those who designed and built them, and they point to the continual back-and-forth process of making the manmade fit within the natural environment, and then bending or even breaking the natural environment to fit man's varied programs and purposes.

### ***MANAGEMENT AREAS OR ZONES***

The surviving landscape characteristics and features with integrity and significance are evenly distributed throughout the EHD to the point that the definition of cultural landscape management areas or zones is not warranted—in essence, the EHD is a cultural landscape management zone in and of itself. There are a few landscape components and features in the EHD that are somewhat isolated and that possibly could be identified as discrete management areas or zones, but the vast majority of the characteristics and features are either found District-wide or are interconnected to the point that separation into individual zones is not necessary.

### ***IMPACTS TO ALTERNATIVES***

Because most of the surviving landscape characteristics and features would remain in place under six of the alternatives—Alternative A calls for removal of all manmade features located at or above grade in the EHD unless natural resource degradation would occur—none of the draft alternatives would have to be changed or eliminated in the EIS process. This information was presented to GRSM staff at a meeting on January 26, 2004.

Although Alternative A calls for removal of all manmade features at or above ground level in the EHD, this alternative could not be reworked to retain all identified landscape

characteristics and features without conflicting with its chief purpose, which is to return the EHD to a natural state through active restoration measures. Because a natural resource-based alternative needed to be in the group of alternatives carried forward to impact analysis in order to provide a full range of alternatives for analysis, and because the remaining six alternatives allow for retention of most of the surviving landscape characteristics and features, it has been determined that the proposed alternatives can be carried forward without alteration, at least in terms of the cultural landscape issues and concerns.

## V. SUMMARY OF FINDINGS

The cultural and historic landscape assessment for the EHD, conducted during 2003 and 2004, has identified a number of surviving landscape characteristics and features that defined the cultural landscape during the historic period chosen for study (1880s–1942) (Table 7). This period, which includes the EHD’s NRHP-listed period of significance, was broken down into five smaller periods that corresponded to key events and major changes in land use and spatial organization. Each of the five periods was then represented on its own cultural and historic landscape map, and a detailed historical chronology was prepared listing all of the events that had an impact on the EHD landscape between the 1880s and 1942.

**Table 7. Surviving Landscape Characteristics and Features with Significance.**

Type of Characteristic or Feature	Description of Examples Found in EHD
Spatial organization	Pattern of watercourses, landforms, circulation routes, topography, vegetation, nodes of development, buildings and structures, and smaller features
Natural systems and features	Little River, Jakes Creek, numerous branches (including redirected Bearwallow Branch), and loss of “island” when stone arch bridge cut off branch of Little River through Elkmont Town (current campground)
Land use	Cemeteries, recreation (swimming hole and campground), and transportation (roads)
Circulation	Old road to Gatlinburg via Fighting Creek Gap, roads into and throughout EHD following removal of railroad tracks, and CCC stone bridge over Little River
Topography and vegetation	Flat land adjacent to watercourses, sloped areas and ridges, native trees and plants (successional forest), and exotic plant species planted by club residents
Water features	Spring head at Bearwallow Branch; power plant base at Jakes Creek; Camp Le Conte lakebed, dam remnants, and base of power plant; Appalachian Club swimming hole; underground cistern near Elkmont Town (current campground)
Buildings and structures	Levi Trentham’s log cabin, Wonderland Club area (hotel, annex, and cabins), Appalachian Club area (clubhouse and cabins in Daisy Town, Society Hill, and Millionaires’ Row), and infrastructure (water tanks, utility lines, etc.)
Small-scale features	Wonderland Hotel steps, fountain, and side paths; remnants of Camp Le Conte dam and power plant; Bearwallow Branch footbridge; CCC culverts and erosion control walls; remnants of CCC walkway at swimming hole; stone fireplace or possible still between Cabins 46 & 47
Views and vistas	Axial views along watercourses and roads; partial panoramic views at Wonderland Hotel, at Cabins 58-4d to 58-9i, and near Cabin 40

The surviving landscape characteristics and features have retained their integrity. While not all characteristics and features from each period have survived, a sufficient number has survived in its original location, in a setting in keeping with the historic setting, with historic design, materials, and workmanship intact, and with a feeling and association that ties back to the historic period. Because the surviving characteristics and features are located within an NRHP-listed historic district and they retain their integrity, they are recommended contributing to the EHD. Those features directly associated with a particular building or structure are recommended contributing to that building or structure, as well as to the District as a whole. Larger, District-wide elements and features not directly tied to a particular building or structure also are recommended contributing to the District.

In terms of cultural landscape management zones for the EHD, the surviving landscape characteristics and features with integrity and significance are evenly distributed throughout the District to the point that the definition of zones is not warranted—in essence, the EHD is a cultural landscape management zone in and of itself. There are a few landscape components and features in the EHD that are somewhat isolated and that possibly could be identified as discrete zones or areas, but the vast majority of the characteristics and features are either found District-wide or are interconnected to the point that separation into individual zones appears unnecessary.

Because most of the surviving landscape characteristics and features would remain in place under six of the seven alternatives proposed for impact analysis under the current EIS, none of the draft alternatives would have to be changed or eliminated in the process. Alternative A, though it calls for removal of all manmade features at or above grade in the EHD, cannot be reworked to retain the landscape characteristics and features without removing its chief purpose, which is to return the EHD to a natural state through active measures. Because a natural resource-based alternative is needed in the group of alternatives, and because the remaining alternatives allow for retention of most of the surviving landscape characteristics and features, it has been determined that the alternatives can be carried forward without alteration, at least in terms of the cultural landscape issues and concerns.

## APPENDIX B

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# Appendix C

## Costs of the Alternatives



Table C-1: Total Costs Summary by Alternative (in 2010 Dollars)

ALTERNATIVE	BUILDING TREATMENT COSTS	INFRASTRUCTURE COSTS	ARCHEOLOGICAL COSTS	VEGETATION MANAGEMENT	RESOURCE EDUCATION COMPONENT COSTS	SUBTOTAL OF COSTS BY ALTERNATIVE (2010 DOLLARS)*	GROSS CONSTRUCTION COST ADJUSTMENT FOR ADDITIONAL SERVICES AND CONTINGENCIES**	TOTAL ONE-TIME CAPITAL COSTS (2010 DOLLARS)
No Action	\$991,432	\$0	\$96,163	\$18,980	\$0	\$1,106,574	\$387,301	\$1,493,875
A	\$991,432	\$0	\$96,163	\$50,612	\$19,739	\$1,157,945	\$405,281	\$1,563,226
B	\$2,786,490	\$668,082	\$121,469	\$18,980	\$164,236	\$3,759,257	\$1,315,740	\$5,074,996
C	\$3,640,938	\$674,223	\$121,469	\$18,980	\$164,236	\$4,619,845	\$1,616,946	\$6,236,791
D1	\$5,634,483	\$1,985,051	\$144,244	\$18,980	\$227,248	\$8,010,006	\$2,803,502	\$10,813,508
D2	\$13,400,753	\$2,199,128	\$144,244	\$18,980	\$227,248	\$15,990,353	\$5,596,623	\$21,586,976
E1	\$7,796,156	\$2,814,914	\$149,305	\$18,980	\$193,844	\$10,973,199	\$3,840,620	\$14,813,818
E2	\$13,717,280	\$3,823,437	\$149,305	\$18,980	\$203,713	\$17,912,715	\$6,269,450	\$24,182,166
F1	\$13,845,131	\$4,305,397	\$159,428	\$18,980	\$193,844	\$18,522,780	\$6,482,973	\$25,005,753
F2	\$19,800,699	\$4,746,438	\$159,428	\$18,980	\$203,713	\$24,929,258	\$8,725,240	\$33,654,498

\* component costs were calculated in 2004 and escalated by 4% per year to account for annual inflation

\*\*gross construction cost adjustment is 35% of subtotal (net construction costs) and includes costs for supplemental services, predesign services, design services, construction supervision, and construction contingencies

The approval of this GMP Amendment does not guarantee that funding or staffing needed to implement the plan will be forthcoming. Full implementation of this plan could be many years into the future and is dependent on funding, Servicewide priorities, and p description of annual operating costs, projected for 20 years, is presented in Appendix C, Table C-7



Table C-2: Estimated Net Construction Costs

	ALTERNATIVE									
	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2
SUB-TOTAL BUILDING TREATMENT COST IN 2004 DOLLARS (Taken from Summary of Estimated Cost of Building Treatments by Alternative)	\$783,555	\$783,555	\$2,202,237	\$2,877,529	\$4,282,170	\$10,420,058	\$5,783,960	\$10,027,977	\$10,057,741	\$14,301,758
TOTAL FOR FURNITURE, FIXTURES AND EQUIPMENT FOR PUBLIC LODGING NOT COVERED IN OTHER CATEGORIES*							\$199,396	\$634,999	\$884,432	\$1,347,257
TOTAL FOR FURNITURE, FIXTURES AND EQUIPMENT FOR VISITING SCIENTIST LODGING NOT COVERED IN OTHER CATEGORIES					\$170,911	\$170,911	\$178,152	\$178,152		
TOTAL BUILDING TREATMENT COST (in 2004)	\$783,555	\$783,555	\$2,202,237	\$2,877,529	\$4,453,081	\$10,590,969	\$6,161,508	\$10,841,128	\$10,942,173	\$15,649,015
TOTAL BUILDING TREATMENT COST (in 2010)	\$991,432	\$991,432	\$2,786,490	\$3,640,938	\$5,634,483	\$13,400,753	\$7,796,156	\$13,717,280	\$13,845,131	\$19,800,699
INFRASTRUCTURE COMPONENTS										
PROPOSED PARKING IMPROVEMENTS TOTAL			\$257,334	\$257,334	\$312,637	\$420,504	\$313,204	\$581,634	\$506,271	\$804,560
WASTEWATER SYSTEM IMPROVEMENTS			\$41,334	\$41,334	\$438,914	\$442,804	\$857,930	\$911,210	\$1,118,750	\$1,122,430
ROAD AND ACCESS SYSTEM IMPROVEMENTS			\$141,718	\$146,572	\$365,150	\$375,986	\$420,625	\$849,381	\$871,470	\$871,470
WATER SYSTEM IMPROVEMENTS			\$51,617	\$51,617	\$391,138	\$437,735	\$542,942	\$589,539	\$786,178	\$832,775
TOTAL ELECTRIC SERVICE AND LINES			\$500	\$500	\$20,000	\$20,000	\$40,000	\$40,000	\$55,000	\$55,000
TOTAL PHONE SERVICE			\$35,500	\$35,500	\$41,000	\$41,000	\$50,000	\$50,000	\$65,000	\$65,000
TOTAL FOR INFRASTRUCTURE in 2004 (Parking, Roads, Water, Wastewater, Electric and Phone)			\$528,003	\$532,856	\$1,568,838	\$1,738,029	\$2,224,701	\$3,021,764	\$3,402,669	\$3,751,235
ARCHEOLOGICALSURVEY, EVALUATION AND MONITORING 2004 COSTS (from Table C-5)	\$76,000	\$76,000	\$96,000	\$96,000	\$114,000	\$114,000	\$118,000	\$118,000	\$126,000	\$126,000
VEGETATION MANAGEMENT 2004 COSTS	\$15,000	\$40,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
RESOURCE EDUCATION COMPONENTS 2004 COSTS	\$0	\$15,600	\$129,800	\$129,800	\$179,600	\$179,600	\$153,200	\$161,000	\$153,200	\$161,000
TOTAL NET CONSTRUCTION COST BY ALTERNATIVE IN 2004	\$874,555	\$915,155	\$2,971,040	\$3,651,186	\$6,330,519	\$12,637,598	\$8,672,409	\$14,156,892	\$14,639,042	\$19,702,251
TOTAL NET CONSTRUCTION COST BY ALTERNATIVE IN 2010	\$1,106,574	\$1,157,945	\$3,759,257	\$4,619,845	\$8,010,006	\$15,990,353	\$10,973,199	\$17,912,715	\$18,522,780	\$24,929,258

\* proposed to be funded by concessioner in Alternatives E and F



Table C-3: Estimated Gross Project Costs with 20-Year Projections

ALTERNATIVE										
	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2
2004 Net Construction Costs (from Table C-2)	\$874,555	\$915,155	\$2,971,040	\$3,651,186	\$6,330,519	\$12,637,598	\$8,672,409	\$14,156,892	\$14,639,042	\$19,702,251
2004 Net Construction Low Cost (-10%)	\$787,099	\$823,639	\$2,673,936	\$3,286,067	\$5,697,467	\$11,373,838	\$7,805,168	\$12,741,203	\$13,175,138	\$17,732,025
Supplemental Services (2% of net const)	\$15,742	\$16,473	\$53,479	\$65,721	\$113,949	\$227,477	\$156,103	\$254,824	\$263,503	\$354,641
Predesign Services (5% of net constr)	\$39,355	\$41,182	\$133,697	\$164,303	\$284,873	\$568,692	\$390,258	\$637,060	\$658,757	\$886,601
Design Services (10% of net constr)	\$78,710	\$82,364	\$267,394	\$328,607	\$569,747	\$1,137,384	\$780,517	\$1,274,120	\$1,317,514	\$1,773,203
Construction Supervision (8% of net constr)	\$62,968	\$65,891	\$213,915	\$262,885	\$455,797	\$909,907	\$624,413	\$1,019,296	\$1,054,011	\$1,418,562
Construction Contingencies (10% of net constr)	\$78,710	\$82,364	\$267,394	\$328,607	\$569,747	\$1,137,384	\$780,517	\$1,274,120	\$1,317,514	\$1,773,203
Total 2004 Gross Construction Low Cost	\$1,062,584	\$1,111,913	\$3,609,813	\$4,436,190	\$7,691,581	\$15,354,681	\$10,536,977	\$17,200,624	\$17,786,436	\$23,938,234
2004 Net Construction High Cost (+25%)	\$1,093,193	\$1,143,943	\$3,713,800	\$4,563,982	\$7,913,149	\$15,796,997	\$10,840,511	\$17,696,115	\$18,298,802	\$24,627,813
Supplemental Services (2% of net const)	\$21,864	\$22,879	\$74,276	\$91,280	\$158,263	\$315,940	\$216,810	\$353,922	\$365,976	\$492,556
Predesign Services (5% of net constr)	\$54,660	\$57,197	\$185,690	\$228,199	\$395,657	\$789,850	\$542,026	\$884,806	\$914,940	\$1,231,391
Design Services (10% of net constr)	\$109,319	\$114,394	\$371,380	\$456,398	\$791,315	\$1,579,700	\$1,084,051	\$1,769,611	\$1,829,880	\$2,462,781
Construction Supervision (8% of net constr)	\$87,455	\$91,515	\$297,104	\$365,119	\$633,052	\$1,263,760	\$867,241	\$1,415,689	\$1,463,904	\$1,970,225
Construction Contingencies (10% of net constr)	\$109,319	\$114,394	\$371,380	\$456,398	\$791,315	\$1,579,700	\$1,084,051	\$1,769,611	\$1,829,880	\$2,462,781
Total 2004 Gross Construction High Cost	\$1,475,811	\$1,544,324	\$5,013,629	\$6,161,376	\$10,682,751	\$21,325,946	\$14,634,690	\$23,889,755	\$24,703,383	\$33,247,548
2010 Net Construction Costs (from Table C-2)	\$1,106,574	\$1,157,945	\$3,759,257	\$4,619,845	\$8,010,006	\$15,990,353	\$10,973,199	\$17,912,715	\$18,522,780	\$24,929,258
2007 Net Construction Low Cost (-10%)	\$995,917	\$1,042,151	\$3,383,331	\$4,157,861	\$7,209,005	\$14,391,317	\$9,875,879	\$16,121,444	\$16,670,502	\$22,436,332
Supplemental Services (2% of net const)	\$19,918	\$20,843	\$67,667	\$83,157	\$144,180	\$287,826	\$197,518	\$322,429	\$333,410	\$448,727
Predesign Services (5% of net constr)	\$49,796	\$52,108	\$169,167	\$207,893	\$360,450	\$719,566	\$493,794	\$806,072	\$833,525	\$1,121,817
Design Services (10% of net constr)	\$99,592	\$104,215	\$338,333	\$415,786	\$720,901	\$1,439,132	\$987,588	\$1,612,144	\$1,667,050	\$2,243,633
Construction Supervision (8% of net constr)	\$79,673	\$83,372	\$270,666	\$332,629	\$576,720	\$1,151,305	\$790,070	\$1,289,716	\$1,333,640	\$1,794,907
Construction Contingencies (10% of net constr)	\$99,592	\$104,215	\$338,333	\$415,786	\$720,901	\$1,439,132	\$987,588	\$1,612,144	\$1,667,050	\$2,243,633
Total 2010 Gross Construction Low Cost	\$1,344,488	\$1,406,903	\$4,567,497	\$5,613,112	\$9,732,157	\$19,428,278	\$13,332,436	\$21,763,949	\$22,505,177	\$30,289,048
2010 Net Construction High Cost (+25%)	\$1,383,218	\$1,447,432	\$4,699,071	\$5,774,806	\$10,012,507	\$19,987,941	\$13,716,498	\$22,390,894	\$23,153,475	\$31,161,572
Supplemental Services (2% of net const)	\$27,664	\$28,949	\$93,981	\$115,496	\$200,250	\$399,759	\$274,330	\$447,818	\$463,069	\$623,231
Predesign Services (5% of net constr)	\$69,161	\$72,372	\$234,954	\$288,740	\$500,625	\$999,397	\$685,825	\$1,119,545	\$1,157,674	\$1,558,079
Design Services (10% of net constr)	\$138,322	\$144,743	\$469,907	\$577,481	\$1,001,251	\$1,998,794	\$1,371,650	\$2,239,089	\$2,315,347	\$3,116,157
Construction Supervision (8% of net constr)	\$110,657	\$115,795	\$375,926	\$461,985	\$801,001	\$1,599,035	\$1,097,320	\$1,791,272	\$1,852,278	\$2,492,926
Construction Contingencies (10% of net constr)	\$138,322	\$144,743	\$469,907	\$577,481	\$1,001,251	\$1,998,794	\$1,371,650	\$2,239,089	\$2,315,347	\$3,116,157
Total 2010 Gross Construction High Cost	\$1,867,344	\$1,954,033	\$6,343,745	\$7,795,989	\$13,516,885	\$26,983,720	\$18,517,273	\$30,227,707	\$31,257,191	\$42,068,122



Table C-3a: 20-Year Projection of Estimated Gross Project Costs

ALTERNATIVE										
20-YEAR COSTS (USING 2004 GROSS LOW CONSTRUCTION COST)										
NO ACTION		A	B	C	D1	D2	E1	E2	F1	F2
2004 Low Costs	\$1,062,584	\$1,111,913	\$3,609,813	\$4,436,190	\$7,691,581	\$15,354,681	\$10,536,977	\$17,200,624	\$17,786,436	\$23,938,234
YEAR 1	\$1,105,087	\$1,156,389	\$3,754,206	\$4,613,638	\$7,999,244	\$15,968,869	\$10,958,456	\$17,888,649	\$18,497,893	\$24,895,764
2	\$1,149,291	\$1,202,645	\$3,904,374	\$4,798,184	\$8,319,214	\$16,607,623	\$11,396,794	\$18,604,195	\$19,237,809	\$25,891,594
3	\$1,195,262	\$1,250,751	\$4,060,549	\$4,990,111	\$8,651,982	\$17,271,928	\$11,852,666	\$19,348,362	\$20,007,321	\$26,927,258
4	\$1,243,073	\$1,300,781	\$4,222,971	\$5,189,715	\$8,998,061	\$17,962,805	\$12,326,772	\$20,122,297	\$20,807,614	\$28,004,348
5	\$1,292,796	\$1,352,812	\$4,391,890	\$5,397,304	\$9,357,984	\$18,681,318	\$12,819,843	\$20,927,189	\$21,639,919	\$29,124,522
2010 Low Costs YEAR 6	\$1,344,508	\$1,406,925	\$4,567,565	\$5,613,196	\$9,732,303	\$19,428,570	\$13,332,637	\$21,764,276	\$22,505,516	\$30,289,503
7	\$1,398,288	\$1,463,202	\$4,750,268	\$5,837,724	\$10,121,595	\$20,205,713	\$13,865,942	\$22,634,847	\$23,405,736	\$31,501,083
8	\$1,454,220	\$1,521,730	\$4,940,279	\$6,071,233	\$10,526,459	\$21,013,942	\$14,420,580	\$23,540,241	\$24,341,966	\$32,761,127
9	\$1,512,388	\$1,582,599	\$5,137,890	\$6,314,082	\$10,947,517	\$21,854,499	\$14,997,403	\$24,481,851	\$25,315,644	\$34,071,572
10	\$1,572,884	\$1,645,903	\$5,343,405	\$6,566,646	\$11,385,418	\$22,728,679	\$15,597,299	\$25,461,125	\$26,328,270	\$35,434,435
11	\$1,635,799	\$1,711,739	\$5,557,142	\$6,829,311	\$11,840,835	\$23,637,827	\$16,221,191	\$26,479,570	\$27,381,401	\$36,851,812
12	\$1,701,231	\$1,780,209	\$5,779,427	\$7,102,484	\$12,314,468	\$24,583,340	\$16,870,039	\$27,538,753	\$28,476,657	\$38,325,885
13	\$1,769,280	\$1,851,417	\$6,010,604	\$7,386,583	\$12,807,047	\$25,566,673	\$17,544,841	\$28,640,303	\$29,615,723	\$39,858,920
14	\$1,840,052	\$1,925,474	\$6,251,029	\$7,682,047	\$13,319,329	\$26,589,340	\$18,246,634	\$29,785,915	\$30,800,352	\$41,453,277
15	\$1,913,654	\$2,002,492	\$6,501,070	\$7,989,328	\$13,852,102	\$27,652,914	\$18,976,500	\$30,977,351	\$32,032,366	\$43,111,408
16	\$1,990,200	\$2,082,592	\$6,761,112	\$8,308,902	\$14,406,186	\$28,759,030	\$19,735,559	\$32,216,446	\$33,313,661	\$44,835,864
17	\$2,069,808	\$2,165,896	\$7,031,557	\$8,641,258	\$14,982,434	\$29,909,392	\$20,524,982	\$33,505,103	\$34,646,207	\$46,629,299
18	\$2,152,600	\$2,252,532	\$7,312,819	\$8,986,908	\$15,581,731	\$31,105,767	\$21,345,981	\$34,845,307	\$36,032,056	\$48,494,471
19	\$2,238,704	\$2,342,633	\$7,605,332	\$9,346,384	\$16,205,000	\$32,349,998	\$22,199,820	\$36,239,120	\$37,473,338	\$50,434,249
20	\$2,328,252	\$2,436,338	\$7,909,545	\$9,720,240	\$16,853,200	\$33,643,998	\$23,087,813	\$37,688,685	\$38,972,271	\$52,451,619
20-YEAR COSTS (USING 2004 GROSS HIGH CONSTRUCTION COST)		A	B	C	D1	D2	E1	E2	F1	F2
2004 High Costs	\$1,475,811	\$1,544,324	\$5,013,629	\$6,161,376	\$10,682,751	\$21,325,946	\$14,634,690	\$23,889,755	\$24,703,383	\$33,247,548
YEAR 1	\$1,534,844	\$1,606,097	\$5,214,175	\$6,407,831	\$11,110,061	\$22,178,984	\$15,220,077	\$24,845,345	\$25,691,519	\$34,577,450
2	\$1,596,237	\$1,670,340	\$5,422,742	\$6,664,144	\$11,554,463	\$23,066,144	\$15,828,880	\$25,839,159	\$26,719,179	\$35,960,548
3	\$1,660,087	\$1,737,154	\$5,639,651	\$6,930,710	\$12,016,642	\$23,988,789	\$16,462,036	\$26,872,725	\$27,787,947	\$37,398,970
4	\$1,726,490	\$1,806,640	\$5,865,237	\$7,207,938	\$12,497,307	\$24,948,341	\$17,120,517	\$27,947,634	\$28,899,464	\$38,894,928
5	\$1,795,550	\$1,878,906	\$6,099,847	\$7,496,256	\$12,997,200	\$25,946,275	\$17,805,338	\$29,065,540	\$30,055,443	\$40,450,725
2010 High Costs YEAR 6	\$1,867,372	\$1,954,062	\$6,343,841	\$7,796,106	\$13,517,088	\$26,984,126	\$18,517,551	\$30,228,161	\$31,257,661	\$42,068,755
7	\$1,942,067	\$2,032,224	\$6,597,594	\$8,107,950	\$14,057,771	\$28,063,491	\$19,258,253	\$31,437,288	\$32,507,967	\$43,751,505
8	\$2,019,749	\$2,113,513	\$6,861,498	\$8,432,268	\$14,620,082	\$29,186,030	\$20,028,583	\$32,694,779	\$33,808,286	\$45,501,565
9	\$2,100,539	\$2,198,054	\$7,135,958	\$8,769,559	\$15,204,885	\$30,353,471	\$20,829,727	\$34,002,571	\$35,160,617	\$47,321,627
10	\$2,184,561	\$2,285,976	\$7,421,396	\$9,120,341	\$15,813,081	\$31,567,610	\$21,662,916	\$35,362,673	\$36,567,042	\$49,214,493
11	\$2,271,943	\$2,377,415	\$7,718,252	\$9,485,155	\$16,445,604	\$32,830,315	\$22,529,432	\$36,777,180	\$38,029,724	\$51,183,072
12	\$2,362,821	\$2,472,512	\$8,026,982	\$9,864,561	\$17,103,428	\$34,143,527	\$23,430,610	\$38,248,268	\$39,550,913	\$53,230,395
13	\$2,457,334	\$2,571,412	\$8,348,062	\$10,259,143	\$17,787,565	\$35,509,268	\$24,367,834	\$39,778,198	\$41,132,949	\$55,359,611
14	\$2,555,627	\$2,674,269	\$8,681,984	\$10,669,509	\$18,499,068	\$36,929,639	\$25,342,547	\$41,369,326	\$42,778,267	\$57,573,995
15	\$2,657,852	\$2,781,240	\$9,029,263	\$11,096,289	\$19,239,031	\$38,406,825	\$26,356,249	\$43,024,099	\$44,489,398	\$59,876,955
16	\$2,764,166	\$2,892,489	\$9,390,434	\$11,540,141	\$20,008,592	\$39,943,098	\$27,410,499	\$44,745,063	\$46,268,974	\$62,272,033
17	\$2,874,733	\$3,008,189	\$9,766,051	\$12,001,747	\$20,808,936	\$41,540,822	\$28,506,919	\$46,534,866	\$48,119,733	\$64,762,915
18	\$2,989,722	\$3,128,516	\$10,156,693	\$12,481,816	\$21,641,293	\$43,202,454	\$29,647,196	\$48,396,260	\$50,044,522	\$67,353,431
19	\$3,109,311	\$3,253,657	\$10,562,961	\$12,981,089	\$22,506,945	\$44,930,553	\$30,833,084	\$50,332,111	\$52,046,303	\$70,047,569
20	\$3,233,684	\$3,383,803	\$10,985,480	\$13,500,333	\$23,407,222	\$46,727,775	\$32,066,407	\$52,345,395	\$54,128,155	\$72,849,471

Assumes 4% annual inflation



**Table C-4: Summary of Estimated Costs for Building Treatments by Alternative\* (2004 Dollars)**

ALTERNATIVE													
Resource Name	Gross Area (Sq Ft)	Net Area (Sq Ft)	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	Comments
Appalachian Clubhouse (C)	5242	4010	\$12,400	\$12,400	\$437,090	\$437,090	\$437,090	\$437,090	\$441,090	\$441,090	\$482,670	\$482,670	RM based on \$0.28 per cf at 44,285 cf (2004 Means); for net sf - add screen porch and subtract basement; day use is based on sf x \$109; alt E - add 2-fixture bathroom @ \$2,000 each fixture (Means 2004); Alternative F - add 375 sf kitchen @ \$100 / sf (2004 Means); add kitchen sprinkler at \$10.88 / sf for 375 sf
			RM	RM	Day use	Day use	Day use	Day use	Day use	Day use	Day use and commercial kitchen	Day use and commercial kitchen	
Sneed (1)(C)	1160	1000	\$10,220	\$10,220	\$88,400	\$88,400	\$88,400	\$88,400	\$88,400	\$88,400	\$88,400	\$88,400	Hand removal is based on gross area x \$4.50 / sf + \$5,000 for 1-story cabin and \$7,000 for a 2-story cabin (Means 2004); Restore exterior and stabilize interior is priced at \$88.40 / sf of net area using Class C Guide at 2004 rate.
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Smith (2)(C)	1150	929	\$10,175	\$10,175	\$82,124	\$82,124	\$82,124	\$82,124	\$82,124	\$82,124	\$82,124	\$82,124	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Higdon (3)(C)	950	870	\$9,275	\$9,275	\$76,908	\$76,908	\$76,908	\$76,908	\$76,908	\$76,908	\$76,908	\$76,908	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Swan (4)(NC)	1180	1082	\$10,310	\$10,310	\$95,649	\$95,649	\$95,649	\$95,649	\$95,649	\$95,649	\$95,649	\$95,649	Alternatives. B-F: Restore exterior as contributing
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Addicks (5) (C)	1020	960	\$9,590	\$9,590	\$84,864	\$84,864	\$84,864	\$84,864	\$84,864	\$84,864	\$84,864	\$84,864	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
"Adamless Eden" (C)**	140	131			\$5,790	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790	
			included above	included above	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Creekmore (6)(C)	900	835	\$9,050	\$9,050	\$73,814	\$73,814	\$73,814	\$73,814	\$73,814	\$73,814	\$73,814	\$73,814	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Mayo (7)(C)	1100	1008	\$9,950	\$9,950	\$89,107	\$89,107	\$89,107	\$89,107	\$89,107	\$89,107	\$89,107	\$89,107	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Levi Trentham Log Cabin (7A)**	320	320	\$2,500	\$2,500	\$14,144	\$14,144	\$14,144	\$14,144	\$14,144	\$14,144	\$14,144	\$14,144	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Mayo Servants' Qtrs (7B) (C)**	280	280	\$2,500	\$2,500	\$12,376	\$12,376	\$12,376	\$12,376	\$12,376	\$12,376	\$12,376	\$12,376	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Cain (8)(C)	1200	1128	\$10,400	\$10,400	\$99,715	\$99,715	\$99,715	\$99,715	\$99,715	\$99,715	\$99,715	\$99,715	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Galyon (9)(C)	1170	1170	\$10,265	\$10,265	\$103,428	\$103,428	\$103,428	\$103,428	\$103,428	\$103,428	\$103,428	\$103,428	
			RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	



**Table C-4: Summary of Estimated Costs for Building Treatments by Alternative\* (2004 Dollars)**

ALTERNATIVE													
Resource Name	Gross Area (Sq Ft)	Net Area (Sq Ft)	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	Comments
Galyon rear 1-rm. (NC)			\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	
			RH	RH	RH	RH	RH	RH	RH	RH	RH	RH	
Baumann (10) (C)	1780	1679	\$13,010	\$13,010	\$13,010	\$148,424	\$148,424	\$148,424	\$148,424	\$148,424	\$148,424	\$148,424	
			RH	RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Scruggs-Brisco (11) (C)	1326	1326	\$10,967	\$10,967	\$10,967	\$117,218	\$117,218	\$117,218	\$117,218	\$117,218	\$117,218	\$117,218	
			RH	RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Sneed (12) (NC)	1200	1200	\$9,400	\$9,400	\$9,400	\$9,400	\$9,400	\$9,400	\$9,400	\$9,400	\$9,400	\$9,400	RM based on \$7,000 for structure and \$2,400 for block foundation
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Cook (13)(C)	1280	1180	\$10,760	\$10,760	\$10,760	\$104,312	\$104,312	\$104,312	\$104,312	\$104,312	\$104,312	\$104,312	
			RH	RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Jamerson (14) (NC)	1312	1312	\$7,400	\$7,400	\$7,400	\$7,400	\$7,400	\$7,400	\$7,400	\$7,400	\$7,400	\$7,400	RM based on \$7,000 for structure and \$400 for block foundation
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Hale (15)(C)	1560	1450	\$5,000	\$5,000	\$5,000	\$128,180	\$128,180	\$128,180	\$128,180	\$128,180	\$128,180	\$128,180	
			RM	RM	RM	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Burdette (16) (NC)	1160	1160	\$7,300	\$7,300	\$7,300	\$7,300	\$7,300	\$7,300	\$7,300	\$7,300	\$7,300	\$7,300	RM based on \$7,000 for structure and \$300 for block foundation
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Bagley (17) (NC)	1677	1677	\$7,700	\$7,700	\$7,700	\$7,700	\$7,700	\$7,700	\$7,700	\$7,700	\$7,700	\$7,700	RM based on \$7,000 for structure and \$700 for block foundation
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Gilliand (18) (C)	1525	1402	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$196,729	\$196,729	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Thomas (19) (C)	1250	1117	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$173,143	\$173,143	Alt F: For structural repairs, add 300 sf x \$40.80 / sf to cost of rehabilitation
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
F. Andrews (20)(NC)	1280	1169	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$165,039	\$165,039	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
Andrews-Sherling (21) (C)	1280	1280	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$10,760	\$174,406	\$174,406	Alt F: For structural repairs, add 200 sf x \$40.80 / sf to cost of rehabilitation
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
Congleton-Brownlow (22)(C)	1045	957	\$9,703	\$9,703	\$9,703	\$9,703	\$9,703	\$9,703	\$9,703	\$9,703	\$134,767	\$134,767	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
McDonald (23)(C)	1400	1300	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$192,984	\$192,984	Alt F: For structural repairs, add 300 sf x \$40.80 / sf to cost of rehabilitation
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
W. Arnett (24)(NC)	1220	1111	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$159,308	\$159,308	Alt. F: add cost for porch repairs at 50 sf x \$40.80 /sf
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	



**Table C-4: Summary of Estimated Costs for Building Treatments by Alternative\* (2004 Dollars)**

ALTERNATIVE													
Resource Name	Gross Area (Sq Ft)	Net Area (Sq Ft)	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	Comments
Franklin (25) (NC)	1250	1137	\$12,625	\$12,625	\$12,625	\$12,625	\$12,625	\$12,625	\$12,625	\$12,625	\$161,121	\$161,121	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
Hutchins (26) (NC)	730	667	\$8,285	\$8,285	\$8,285	\$8,285	\$8,285	\$8,285	\$8,285	\$8,285	\$94,127	\$94,127	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
Gaines (27) (NC)	1300	1193	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	
			RH	RH	RH	RH	RH	RH	RH	RH	RH	RH	
Spengler-Schmid (28) (NC)	1100	1033	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$144,139	\$144,139	Alt. F: includes additional \$2,000 to restore side of building
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
F. Arnett (29) (C)	1100	1016	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$141,954	\$141,954	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Wright (30) (C)	1470	1364	\$11,615	\$11,615	\$11,615	\$11,615	\$11,615	\$11,615	\$11,615	\$11,615	\$189,770	\$189,770	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
Matthews (31)(C)	1300	1247	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$168,267	\$168,267	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
"Little Cottage" (31A) (C)**	320	300	\$3,220	\$3,220	\$3,220	\$3,220	\$3,220	\$3,220	\$3,220	\$3,220	\$39,712	\$39,712	
			RH	RH	RH	RH	RH	RH	RH	RH	Rehabilitate for lodging	Rehabilitate for lodging	
Allen (32)(C)	1200	1154	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$155,356	\$155,356	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Jeffords (33) (NC)	1119	1024	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$144,302	\$144,302	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
McAmis (34) (C)	1075	984	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$138,631	\$138,631	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Culver (35) (C)	1400	1308	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$180,831	\$180,831	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Knafl (36) (C)	1010	925	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Johnston (37) (NC)	875	804	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$121,033	\$121,033	Alt. F: Add \$8,160 (200 sf x \$40.80/sf) for structural damage
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Byers (or Chapman) (38)(C)	1200	1115	\$7,000	\$7,000	\$7,000	\$106,080	\$106,080	\$106,080	\$106,080	\$106,080	\$106,080	\$106,080	
			RM	RM	RM	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & preserve interior	
Dudley (39) (C)	2400	2277	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$310,374	\$310,374	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	



**Table C-4: Summary of Estimated Costs for Building Treatments by Alternative\* (2004 Dollars)**

ALTERNATIVE													
Resource Name	Gross Area (Sq Ft)	Net Area (Sq Ft)	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	Comments
Kuhlman (40) (C)	1200	1119	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$154,975	\$154,975	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Kuhlman garage and woodshed (40A) (C)	400	400	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$8,000	\$8,000	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for storage	Rehabilitate for storage	
McNabb (41) (NC)	1000	822	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$131,943	\$131,943	Alt F. Add \$4,000 for repair of structural damage
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate for lodging	Rehabilitate for lodging	
Spence (42) ("River Lodge") (C)	2160	1850	\$14,720	\$14,720	\$14,720	\$14,720	\$163,540	\$163,540	\$277,168	\$277,168	\$277,168	\$277,168	
			RH	RH	RH	RH	Restore exterior & preserve interior	Restore exterior & preserve interior	Restore exterior & rehabilitate interior for scientist lodging	Restore exterior & rehabilitate interior for scientist lodging	Rehabilitate for lodging	Rehabilitate for lodging	
Brandau (43) (C)	1070	980	\$9,815	\$9,815	\$9,815	\$9,815	\$9,815	\$9,815	\$146,152	\$146,152	\$146,152	\$146,152	Alts E and F: add \$8,160 for repair of structural damage (200 sf x \$40.80/sf)
			RH	RH	RH	RH	RH	RH	Restore exterior & rehabilitate interior for scientist lodging	Restore exterior & rehabilitate interior for scientist lodging	Rehabilitate for lodging	Rehabilitate for lodging	
Parrott (44) (NC)	1500	1389	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Murphy (45) (C)	1900	1728	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$257,141	\$257,141	\$257,141	\$257,141	Alts E and F: add \$12,240 for repair of structural damage (300 sf x \$40.80/sf)
			RM	RM	RM	RM	RM	RM	Restore exterior & rehabilitate interior for scientist lodging	Restore exterior & rehabilitate interior for scientist lodging	Rehabilitate for lodging	Rehabilitate for lodging	
Murphy garage (45A) (NC)			\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	
			RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	
Murphy gazebo (NC)			cost included above	cost included above	cost included above	cost included above	cost included above	cost included above	cost included above	cost included above	\$200	\$200	
			RM	RM	RM	RM	RM	RM	RM	RM	repair & paint	repair & paint	
Miller (46) (C)	1900	1730	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$253,082	\$253,082	\$253,082	\$253,082	Alts E and F: add \$8,160 for repair of structural damage (200 sf x \$40.80/sf)
			RM	RM	RM	RM	RM	RM	Restore exterior & rehabilitate interior for scientist lodging	Restore exterior & rehabilitate interior for scientist lodging	Rehabilitate for lodging	Rehabilitate for lodging	
Faust (47) (C)	1400	1307	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$188,980	\$188,980	\$188,980	\$188,980	Alts E and F: add \$8,160 for repair of structural damage (200 sf x \$40.80/sf)
			RH	RH	RH	RH	RH	RH	Restore exterior & rehabilitate interior for scientist lodging	Restore exterior & rehabilitate interior for scientist lodging	Rehabilitate for lodging	Rehabilitate for lodging	
Faust garage (47A) (C)			\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$8,000	\$8,000	\$8,000	\$8,000	
			RH	RH	RH	RH	RH	RH	Rehabilitate for storage	Rehabilitate for storage	Rehabilitate for storage	Rehabilitate for storage	
Young (48) (NC)	1300	1210	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	\$10,850	
			RH	RH	RH	RH	RH	RH	RH	RH	RH	RH	
Cambier (49) (C)	1300	1225	\$12,850	\$12,850	\$12,850	\$12,850	\$12,850	\$12,850	\$168,028	\$168,028	\$168,028	\$168,028	
			RH	RH	RH	RH	RH	RH	Restore exterior & rehabilitate interior for scientist lodging	Restore exterior & rehabilitate interior for scientist lodging	Rehabilitate for lodging	Rehabilitate for lodging	



**Table C-4: Summary of Estimated Costs for Building Treatments by Alternative\* (2004 Dollars)**

ALTERNATIVE													
Resource Name	Gross Area (Sq Ft)	Net Area (Sq Ft)	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	Comments
May or Moore (58-1A) (C)	1300	1253	\$12,850	\$12,850	\$12,850	\$12,850	\$172,413	\$172,413	\$172,413	\$172,413	\$172,413	\$172,413	Alts. D, E, and F: add \$4,080 for repair of structural damage (100 sf x \$40.80/sf)
			RH	RH	RH	RH	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	
Paine (58-2B) (C)	1400	1292	\$5,000	\$5,000	\$5,000	\$5,000	\$184,737	\$184,737	\$184,737	\$184,737	\$184,737	\$184,737	Alts. D, E, and F: add \$4,080 for repair of structural damage (100 sf x \$40.80/sf)
			RM	RM	RM	RM	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	
Preston (58-3C) (C)	1220	1114	\$10,490	\$10,490	\$10,490	\$10,490	\$157,300	\$157,300	\$157,300	\$157,300	\$157,300	\$157,300	
			RH	RH	RH	RH	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	
Bowman Brown (58-4D) (NC)	2300	2153	\$17,350	\$17,350	\$17,350	\$17,350	\$17,350	\$17,350	\$17,350	\$17,350	\$17,350	\$17,350	
			RH	RH	RH	RH	RH	RH	RH	RH	RH	RH	
Hicks (58-5E) (C)	1400	1100	\$11,300	\$11,300	\$11,300	\$11,300	\$178,568	\$178,568	\$178,568	\$178,568	\$178,568	\$178,568	
			RH	RH	RH	RH	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	
McMillian/Keith (58-6F) (NC)	1340	949	\$11,030	\$11,030	\$11,030	\$11,030	\$11,030	\$11,030	\$11,030	\$11,030	\$11,030	\$11,030	
			RH	RH	RH	RH	RH	RH	RH	RH	RH	RH	
Vandergriff (58-7G) (NC)	1230	1129	\$12,535	\$12,535	\$12,535	\$12,535	\$12,535	\$12,535	\$168,854	\$168,854	\$168,854	\$168,854	Alts E and F: add \$10,200 for repair of structural damage (250 sf x \$40.80/sf)
			RH	RH	RH	RH	RH	RH	Rehabilitate interior for lodging	Rehabilitate interior for lodging	Rehabilitate interior for lodging	Rehabilitate interior for lodging	
Tate, Beaman & Tucker (58-8H) (C)	1700	1553	\$14,650	\$14,650	\$14,650	\$14,650	\$227,357	\$227,357	\$227,357	\$227,357	\$227,357	\$227,357	Alts E and F: add \$8,160 for repair of structural damage (200 sf x \$40.80/sf)
			RH	RH	RH	RH	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	
Richards or Brandau (58-9I) (NC)	1200	876	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$164,571	\$164,571	Alt F: add \$12,240 for repair of structural damage (300 sf x \$40.80/sf)
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate interior for lodging	Rehabilitate interior for lodging	
Richards or Brandau woodshed (NC)			\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$17,680	\$17,680	
			RM	RM	RM	RM	RM	RM	RM	RM	Rehabilitate interior for storage	Rehabilitate interior for storage	
Wonderland Servants' Quarters (Riordan) (C)	1220	1126	\$5,000	\$5,000	\$5,000	\$5,000	\$157,431	\$157,431	\$157,431	\$157,431	\$157,431	\$157,431	
			RM	RM	RM	RM	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for scientist lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	Restore exterior; rehabilitate interior for lodging	
Wonderland Hotel (58) (C)	13391	13391	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$3,691,000	\$45,000	\$2,725,000	\$45,000	\$2,725,000	Hotel is 160,714 cubic feet; removal costs are cf x \$0.28 per cf
			RM	RM	RM	RM	RM	Reconstruct for curatorial	RM	Reconstruct hotel for lodging	RM	Reconstruct hotel for lodging	
Wonderland Hotel Annex (C)	7025	6425	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$1,590,600	\$35,000	\$951,625	\$35,000	\$951,625	Annex is 125,000 cf; removal costs are cf x \$0.28 per cf
			RM	RM	RM	RM	RM	Restore exterior and rehabilitate interior for curatorial use	RM	Restore exterior and rehabilitate interior for lodging	RM	Restore exterior and rehabilitate interior for lodging	



Table C-4: Summary of Estimated Costs for Building Treatments by Alternative\* (2004 Dollars)

ALTERNATIVE													
Resource Name	Gross Area (Sq Ft)	Net Area (Sq Ft)	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	Comments
COST OF BUILDING TREATMENTS SUBTOTAL			\$616,579	\$616,579	\$1,773,353	\$2,330,830	\$3,498,166	\$8,699,766	\$4,746,531	\$8,343,156	\$8,295,654	\$11,892,279	
# BUILDINGS TO BE CLEANED BY SERVICE MASTER					12	17	25	25	33	33	58	58	
CLEANING COST (\$3,610 PER BUILDING)					\$43,320	\$61,370	\$90,250	\$90,250	\$119,130	\$119,130	\$209,380	\$209,380	
SEEDING AND / OR RESTORATION OF FORMER BUILDING SITES			\$47,450	\$47,450	\$39,000	\$35,750	\$29,900	\$29,900	\$25,350	\$25,350	\$7,800	\$7,800	
APPALACHIAN CLUBHOUSE CLEANING					\$10,617	\$10,617	\$10,617	\$10,617	\$10,617	\$10,617	\$10,617	\$10,617	
SUBTOTAL WITH CLEANING AND SEEDING / RESTORATION			\$664,029	\$664,029	\$1,866,302	\$2,438,584	\$3,628,958	\$8,830,558	\$4,901,661	\$8,498,286	\$8,523,509	\$12,120,134	
ADDITIONAL COSTS FOR GENERAL SITE CONDITIONS (18%)			\$119,525	\$119,525	\$335,934	\$438,945	\$653,212	\$1,589,500	\$882,299	\$1,529,691	\$1,534,232	\$2,181,624	
GRAND TOTAL BY ALTERNATIVE FOR BUILDINGS			\$783,555	\$783,555	\$2,202,237	\$2,877,529	\$4,282,170	\$10,420,058	\$5,783,960	\$10,027,977	\$10,057,741	\$14,301,758	

RM = remove, mechanical; RH = remove by hand

\* Calculated with Means 2004 \*\* building < 500 sf calculated at reduced costs



#### Table C-4a: Building Treatments Table Key

National Park Service: *Class "C" Estimating Guide, Historic Preservation and Stabilization* ; April 1993: "These cost figures are valid through December 1995"

National Park Service: *Class "C" Estimating Guide, New Construction* . February 28, 2001

R. S. Means Company, Inc.: *Means Building Construction Cost Data 1995*, 53rd annual addition 1994

R. S. Means Company, Inc.: *Repair and Remodeling Cost Data 2004* , 25th annual addition 2003

David Chapman, GRSM: provided \$18 / sf cost for "dry" sprinkler system for curatorial facility

Service Master of the Smokies: Project Manager Mark Burkett provided estimate for content removal and antiseptic cleaning of cabins.

**Hanta Virus Treatment:** GRSM Safety Officer Lance Lewis determined that testing would not be required and all structures would be treated as potentially infected with the virus.

Additional costs relative to this would be minimal primarily consisting of the use of respirators by workers and a final disinfecting as included in the Service Master quote.

**Inflation Factor:** (used to adjust 1995 National Park cost figures)

1995 data from the Park's *Class "C Estimating Guide* was used with an inflation mark-up of 4% per year arrived at by comparing identical entries from the Means 1995 cost data and the Means 2004 cost data.

**Park Cost Adjustment:** Cost estimate increased to reflect the higher cost of working in a National Park (from 2-18-04 phone conversation with Bob Merrick at the NPS Denver Service Center).

18% for General Conditions

**Demolition costs:** (figures from 2004 Means Cost Data confirmed by Burnett Demolition)

1 story cabin mechanical removal: \$5,000

2 story cabin mechanical removal: \$7,000

removal of 1 story building < 500 sf: \$2,500

garage or small structure removal: \$1,000

Hand removal \$40.50 / cubic yard based on 1 cubic yard per square yard of floor area

Mechanical removal cost = \$4.50 per square foot

Removal of footings and for #12, 14, 16 & 17 only: \$12 / linear foot footings

Removal of block foundations for #12, 14, 16 & 17 only: \$2.30 / sf block

Hotel, Annex, and Appalachian Clubhouse mechanical removal \$0.28 / cubic foot of standing building.

Burnett Demolition, Pers. comm. confirmed Means demolition costs as adequate to include some handwork, use of respirators, and remote site conditions.

#### Rehabilitation and Restoration Costs

Figures from Class "C" estimating guide with 1.36 inflation factor: Inclusions based on 2-18-04 phone conversation with Bob Merrick at NPS' Denver Service Center. Costs escalated at 4% per year.

**\$88.40** / sf for exterior only restoration for exhibit (includes structural repair, new roof, exterior doors, windows and finishes.)

**\$119** / sf for inhabitable interiors (includes exterior restoration plus electrical, plumbing, and interior finishes.) Cost provided by GRSM based on similar projects.

**\$40.80** / sf for additional structural repair based on area to be repaired.

**\$109** / sf for commercial space in Appalachian Clubhouse (includes exterior repair doors, windows, new roof, structural repair, interior finishes, electrical, plumbing (no commercial kitchen).

**\$140** / sf rehab Annex for hotel use includes all above plus 35% for reconfiguring existing building (7% cut & patch existing; 7% limited equipment use; 6% limited material storage;

6% protection of existing work; and 9% temp. bracing and shoring)

treatment of 1 story building < 500 sf calculated at 50% of estimated cost for larger buildings

**\$10.88** / sf for water sprinkler systems for cabins

#### Figures from other sources:

**\$18** / sf for "dry" sprinkler system for curatorial space (GRSM)

**\$200** / sf for new hotel with restaurant (Means 2004; inflated as per discussion with concessionaire Denver North Corporation based on their lodge construction in Sequoia National Park)

**\$224** / sf for new laboratory space for curatorial facility (Means 2004) also used for Annex curatorial reuse

**\$3,610** per cabin for content removal and antiseptic cleaning of average 1,100 sf cabin (Service Master)

**\$100** / sf for commercial kitchen space (Means 2004) used for Alt F Appalachian Clubhouse (375 sf kitchen area only)

**\$7,525** to rebuild leaning chimney at Wonderland servants Quarters (Riordan) (Means 2004)

other chimney repair is not included

**\$0.33** / sf for pressure washing pervious pavement (Mobile Power Washing Services)



Table C-5: Potential Costs for Additional Archeological Survey, Evaluation, and Monitoring in Elkmont Historic District

Site	Locus	Assessment	Cost by Project Alternative									
			No Action	A	B	C	D1	D2	E1	E2	F1	F2
40SV120	Locus A	Potentially significant resource	\$21,000	\$21,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000
	Locus B	Non-significant resource	None	None	None	None	None	None	None	None	None	None
	Locus C	Potentially significant resource	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000
	Locus D	Significant resource	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$13,000	\$13,000
	Other Areas	Unsurveyed	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000
40SV121	Locus A	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus B	Potentially significant resource	None	None	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800
40SV122	Locus A	Potentially significant resource	None	None	\$10,200	\$10,200	\$10,200	\$10,200	\$10,200	\$10,200	\$10,200	\$10,200
	Locus B	Non-significant resource	None	None	None	None	None	None	None	None	None	None
	Locus C	Non-significant resource	None	None	None	None	None	None	\$2,000	\$2,000	\$2,000	\$2,000
	Locus D	Non-significant resource	None	None	None	None	None	None	None	None	None	None
	Other Areas	Unsurveyed	\$12,500	\$12,500	\$12,500	\$12,500	\$12,500	\$12,500	\$14,500	\$14,500	\$14,500	\$14,500
40SV123	Locus A	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus B	Potentially significant resource	\$1,500	\$1,500	\$1,500	\$1,500	\$9,500	\$9,500	\$9,500	\$9,500	\$9,500	\$9,500
40SV124	Locus A	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus B	Non-significant resource	None	None	None	None	None	None	None	None	None	None
40SV125	Locus A	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus B	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus C	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus D	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
	Locus E	Non-significant resource	None	None	None	None	None	None	None	None	None	None
	Locus F	Non-significant resource	None	None	None	None	None	None	None	None	None	None
40SV165	Locus A	Non-significant resource	No effect	None	None	None	None	None	None	None	None	None
40SV166	Locus A	Potentially significant resource	\$12,000	\$12,000	\$12,000	\$12,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000
	Locus B	Potentially significant resource	None	None	None	None	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
	Locus C	Non-significant resource	None	None	None	None	None	None	None	None	None	None
	Locus D	Potentially significant resource	None	None	None	None	None	None	None	None	None	None
Total Projected Costs (2004)			\$76,000	\$76,000	\$96,000	\$96,000	\$114,000	\$114,000	\$118,000	\$118,000	\$126,000	\$126,000
Total Projected Costs (2010)			\$96,163	\$96,163	\$121,469	\$121,469	\$144,244	\$144,244	\$149,305	\$149,305	\$159,428	\$159,428



Table C-6: Resource Education Components by Alternative (2004 Dollars)

	ALTERNATIVE									
	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2
<b>RESOURCE EDUCATION COMPONENTS</b>										
<b>Orientation Area and Parking</b>										
3-Panel Orientation Kiosk			\$23,400	\$23,400	\$23,400	\$23,400	\$23,400	\$23,400	\$23,400	\$23,400
Self-guiding Brochure			\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
<b>Wonderland Hotel</b>										
Wayside Exhibits			\$7,800	\$7,800	\$7,800		\$7,800		\$7,800	
Exhibits on Porch						\$7,800		\$7,800		\$7,800
Lobby Exhibits								\$7,800		\$7,800
<b>Elkmont Campground</b>										
Wayside Exhibit		\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
<b>Millionaire's Row</b>										
Spence Wayside Exhibit					\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
Murphy Wayside Exhibit							\$7,800	\$7,800	\$7,800	\$7,800
Interior Exhibits at Spence Cabin							\$7,800	\$7,800	\$7,800	\$7,800
Synchronous Firefly Wayside Exhibit		\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
<b>Society Hill</b>										
Wayside Exhibit at Chapman Cabin				\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
<b>Daisy Town</b>										
Wayside Exhibit at the Mayo Cabin			\$7,800							
Wayside Exhibit at the Daisy Town Mailboxes			\$7,800							
Wayside Exhibit with Orientation to Daisy Town				\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
Wayside Exhibit looking up Daisy Town Streetscape			\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
Wayside Exhibit Near the Appalachian Clubhouse			\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
Wayside Exhibit on West Side of Appalachian Clubhouse			\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800
Interior Exhibits at Appalachian Clubhouse			\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
<b>General</b>										
Interpretive Programs					\$42,000	\$42,000				
Revise Elkmont Nature Trail Brochure			\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
<b>TOTAL FOR RESOURCE EDUCATION COMPONENTS (2004 COSTS)</b>	<b>\$0</b>	<b>\$15,600</b>	<b>\$129,800</b>	<b>\$129,800</b>	<b>\$179,600</b>	<b>\$179,600</b>	<b>\$153,200</b>	<b>\$161,000</b>	<b>\$153,200</b>	<b>\$161,000</b>
<b>TOTAL FOR RESOURCE EDUCATION COMPONENTS (2010 COSTS)</b>	<b>\$0</b>	<b>\$19,739</b>	<b>\$164,236</b>	<b>\$164,236</b>	<b>\$227,248</b>	<b>\$227,248</b>	<b>\$193,844</b>	<b>\$203,713</b>	<b>\$193,844</b>	<b>\$203,713</b>



Table C-7: Estimated Operation and Maintenance (O&amp;M) Costs with 20-Year Projections

ALTERNATIVE											
	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	
Upkeep of buildings used for exhibits and day use at Appalachian Clubhouse excluding interior of restrooms (ave. \$500/cabin; \$1000 for Appalachian Clubhouse)			\$7,000	\$9,500	\$10,000	\$10,000	\$9,500	\$9,500	\$9,500	\$9,500	
Annual maintenance of visiting scientist housing					\$9,000	\$9,000	\$9,000	\$9,000			
Annual maintenance of curatorial facility mowing	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,000	\$2,000	\$1,500	\$1,500	
trash removal	\$2,500	\$2,500	\$2,500	\$2,500	\$3,500	\$5,000	\$3,500	\$3,500	\$3,500	\$3,500	
Annual cost of daily maintenance of restroom facilities @ 2 hours per restroom per day plus supplies			\$36,500	\$36,500	\$36,500	\$73,000	\$36,500	\$36,500	\$36,500	\$36,500	
maintain / clean / replace exterior exhibits*	\$0	\$1,256	\$2,691	\$2,691	\$2,691	\$2,736	\$2,691	\$2,781	\$2,691	\$2,781	
maintain / clean / replace interior exhibits*	\$0	\$0	\$7,880	\$7,880	\$7,880	\$7,880	\$7,880	\$7,880	\$7,880	\$11,820	
Law Enforcement**	\$39,000	\$39,000	\$39,000	\$39,000	\$84,000	\$84,000	\$84,000	\$84,000	\$84,000	\$84,000	
Housing for Law Enforcement					\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	
Infrastructure	\$2,750	\$2,750	\$6,000	\$7,000	\$12,750	\$14,400	\$21,250	\$25,200	\$30,100	\$34,600	
Annual maintenance of drip irrigation system								\$10,000	\$10,000	\$10,000	
Annual maintenance of pervious pavement (frequency of treatment = every 2 years; \$0.33 per square foot)	\$0	\$0	\$9,344	\$9,344	\$10,781	\$15,094	\$10,781	\$21,562	\$17,250	\$25,156	
Management of Concessions Contract							\$140,000	\$140,000	\$140,000	\$140,000	
Total O & M in 2004 dollars	\$46,750	\$48,006	\$113,415	\$116,915	\$185,602	\$234,610	\$333,102	\$357,923	\$348,921	\$365,357	
Total Annual O&M Adjusted for 4% Inflation by Year; Starting in 2007	NO ACTION	A	B	C	D1	D2	E1	E2	F1	F2	
2010; YEAR 4	1	\$52,360	\$53,767	\$127,025	\$130,945	\$207,875	\$262,763	\$373,075	\$400,874	\$390,792	\$409,199
	2	\$54,454	\$55,918	\$132,106	\$136,183	\$216,190	\$273,273	\$387,998	\$416,909	\$406,423	\$425,567
	3	\$56,633	\$58,154	\$137,390	\$141,630	\$224,837	\$284,204	\$403,518	\$433,585	\$422,680	\$442,590
	4	\$58,898	\$60,481	\$142,886	\$147,295	\$233,831	\$295,572	\$419,658	\$450,928	\$439,587	\$460,294
	5	\$61,254	\$62,900	\$148,601	\$153,187	\$243,184	\$307,395	\$436,445	\$468,965	\$457,171	\$478,705
	6	\$63,704	\$65,416	\$154,545	\$159,314	\$252,911	\$319,691	\$453,902	\$487,724	\$475,458	\$497,854
	7	\$66,252	\$68,033	\$160,727	\$165,687	\$263,028	\$332,479	\$472,059	\$507,233	\$494,476	\$517,768
	8	\$68,902	\$70,754	\$167,156	\$172,314	\$273,549	\$345,778	\$490,941	\$527,522	\$514,255	\$538,478
	9	\$71,658	\$73,584	\$173,842	\$179,207	\$284,491	\$359,609	\$510,579	\$548,623	\$534,825	\$560,018
	10	\$74,525	\$76,527	\$180,796	\$186,375	\$295,871	\$373,993	\$531,002	\$570,568	\$556,218	\$582,418
10 Year Total O & M Cost	\$628,640	\$645,534	\$1,525,073	\$1,572,137	\$2,495,767	\$3,154,757	\$4,479,175	\$4,812,932	\$4,691,886	\$4,912,892	
	11	\$77,506	\$79,588	\$188,028	\$193,830	\$307,705	\$388,953	\$552,242	\$593,391	\$578,467	\$605,715
	12	\$80,606	\$82,772	\$195,549	\$201,583	\$320,014	\$404,511	\$574,331	\$617,127	\$601,606	\$629,944
	13	\$83,830	\$86,083	\$203,371	\$209,647	\$332,814	\$420,692	\$597,305	\$641,812	\$625,670	\$655,141
	14	\$87,183	\$89,526	\$211,506	\$218,033	\$346,127	\$437,519	\$621,197	\$667,484	\$650,697	\$681,347
	15	\$90,671	\$93,107	\$219,966	\$226,754	\$359,972	\$455,020	\$646,045	\$694,183	\$676,725	\$708,601
	16	\$94,297	\$96,832	\$228,764	\$235,824	\$374,371	\$473,221	\$671,887	\$721,951	\$703,794	\$736,945
	17	\$98,069	\$100,705	\$237,915	\$245,257	\$389,346	\$492,150	\$698,762	\$750,829	\$731,945	\$766,423
	18	\$101,992	\$104,733	\$247,432	\$255,067	\$404,919	\$511,836	\$726,713	\$780,862	\$761,223	\$797,080
	19	\$106,072	\$108,922	\$257,329	\$265,270	\$421,116	\$532,309	\$755,781	\$812,096	\$791,672	\$828,963
	20	\$110,315	\$113,279	\$267,622	\$275,881	\$437,961	\$553,601	\$786,012	\$844,580	\$823,339	\$862,121
20 Year Total O & M Cost	\$1,559,180	\$1,601,081	\$3,782,554	\$3,899,284	\$6,190,111	\$7,824,569	\$11,109,449	\$11,937,247	\$11,637,025	\$12,185,172	

\* based on cleaning exterior exhibits once per year at \$44.67 each; interior exhibit cleaning at \$3,940 each; replacement of two exhibits every 3 years at annual cost of \$2,334

\*\* current law enforcement expenditures are estimated based on 0.25 of one GS-9, Step 5 FTE

estimated law enforcement for Alternatives No Action through C are based on the actual need for enforcement under the existing condition and the assumption that visitor use will remain constant



**Elkmont Historic District**  
**Preliminary Capital Cost Estimate: Alternative B**

**Proposed Parking Improvements (B)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Orientation Area Parking Lot	Parking Area - paved 1-25 cars	space	\$ 2,160.00	12	25,920
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.2	758
2	Appalachian Clubhouse Lot	Parking Area - paved 26-50 cars	space	\$ 1,950.00	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	5,400
3	Along Millionaire's Row	Parking Area - paved 26-50 cars	space	\$ 1,950.00	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
4	Parking at former cabins 12,14,16,& 17	Parking Area - paved 26-50 cars	space	\$ 1,950.00	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
5	Striping	Striping	linear feet	\$ 1.25	2,300	2,875
6	Infiltration trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic feet	\$ 2.50	4,020	10,050
7	Parking wheel stops - precast	Parking wheel stops - precast	each	\$ 81.00	106	8,586
					<b>TOTAL</b>	<b>257,334</b>

**Wastewater System Improvements (B)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter sewer line	PVC Sewer Pipe D3034 - 8 inch	linear feet	\$ 51.90	600	31,140
2	8" diameter sewer line under Jakes Creek	Ductile iron sewer pipe - 8 inch	linear feet	\$ 54.10	40	2,164
		Standard manhole	each	\$ 3,140.00	2	6,280
3	Connection to existing sewer system	None available	each	\$ 1,000.00	1	1,000
4	Asphalt repair	None available	linear feet	\$ 30.00	25	750
					<b>TOTAL</b>	<b>41,334</b>

**Proposed Roadway System Improvements (B)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Relocate gate at Jakes Creek Road	None available	each	\$ 500.00	1	500
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to Hotel	Trails, gravel	square yard	\$ 18.20	367	6,673
7	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
8	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
					<b>TOTAL</b>	<b>141,718</b>

**Water System Improvements (B)**

ITEM	NPS Description		Unit	Unit Price	Qty	Total
1	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear feet	\$ 31.40	1,300	40,820
2	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	3	2,337
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	1,000	3,000
4	2" blow-off including valve & box	None available	each	\$ 700.00	1	700
5	Air release valve (1 in - 2 in) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	1	4,760
					TOTAL	51,617

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.

**Total for Alternative B (2004): \$492,003**



Elkmont Historic District  
Preliminary Capital Cost Estimate: Alternative C

Proposed Parking Improvements (C)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Orientation Area Parking Lot	Parking Area - paved 1-25 cars	space	\$ 2,160.00	12	25,920
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.2	758
2	Appalachian Clubhouse Lot	Parking Area - paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	5,400
3	Along Millionaire's Row	Parking Area - paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
4	Parking at former cabins 12,14,16,& 17	Parking Area - paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
5	Striping	Striping	linear foot	\$ 1.25	2,300	2,875
6	Infiltration Trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic foot	\$ 2.50	4,020	10,050
7	Parking Wheel Stops - Precast	Parking wheel stops - precast	each	\$ 81.00	106	8,586
					<b>TOTAL</b>	<b>257,334</b>

Wastewater System Improvements (C)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" Dia. Sewer Line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	600	31,140
2	8" Dia. Sewer Line Under Jake's Creek	Ductile iron sewer pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	Standard Manhole	Standard manhole	each	\$ 3,140.00	2	6,280
4	Connection to Existing Sewer System	None available	each	\$ 1,000.00	1	1,000
5	Asphalt Repair	None available	linear foot	\$ 30.00	25	750
					<b>TOTAL</b>	<b>41,334</b>

Proposed Roadway System Improvements (C)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Relocate gate at Jakes Creek Road	None available	each	\$ 500.00	1	500
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to Hotel steps	Trails, gravel	square yard	\$ 18.20	367	6,673
7	Walking path on west side of steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
8	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
9	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
					<b>TOTAL</b>	<b>146,572</b>



Water System Improvements (C)

ITEM	NPS Description		Unit	Unit Price	Qty	Total
1	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1300	40,820
2	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	3	2,337
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	1,000	3,000
4	2" blow-off including valve and box	None available	each	\$ 700.00	1	700
5	Air release valve (1 inch - 2 inch) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	1	4,760
					TOTAL	51,617

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**Total for Alternative C (2004): \$496,856**



**Elkmont Historic District**  
**Preliminary Capital Cost Estimate: Alternative D1**

**Proposed Parking Improvements (D1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Orientation Area parking lot					
		Parking Area - paved 1-25 cars	space	\$ 2,160.00	25	54,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.2	758
2	Appalachian Clubhouse Lot					
		Parking Area - paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	5,400
3	Along Millionaire's Row					
		Parking Area - paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
4	Parking at former cabins 12,14,16,& 17					
		Parking Area - paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
5	Parking spaces at cabins	Parking Area - paved 1-25 cars	space	\$ 2,160.00	12	25,920
6	Striping	Striping	linear foot	\$ 1.25	2,500	3,125
7	Infiltration trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic foot	\$ 2.50	4,020	10,050
8	Parking wheel stops - precast	Parking wheel stops - precast	each	\$ 81.00	119	9,639
					<b>TOTAL</b>	<b>312,637</b>

**Wastewater System Improvements (D1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter sewer line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	1,200	62,280
2	8" diameter sewer line under Jakes Creek	Ductile iron sewer pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	4" diameter sewer service line	PVC Sewer Pipe D3034 - 4 inch	linear foot	\$ 27.00	100	2,700
4	Standard manhole	Standard manhole	each	\$ 3,140.00	8	25,120
5	2" diameter low pressure sewer line	Polyvinyl Chloride (PVC) Pipe - 2 inch D2241	linear foot	\$ 21.60	750	16,200
6	3" diameter pressure force main	Polyvinyl Chloride (PVC) Pipe - 3 inch D2241	linear foot	\$ 29.20	3,200	93,440
7	Sewage lift station - single residence	Sewage lift station - single residence	each	\$ 7,790.00	4	31,160
8	Sewage pump station (wetwell and dual pumps) - large	Sewage pump station (wetwell and dual pumps) - large	each	\$ 173,100.00	1	173,100
9	Connection to existing sewer system	None available	each	\$ 1,000.00	2	2,000
10	Asphalt repair	None available	linear foot	\$ 30.00	25	750
11	Flow equalization basin	None available	lump sum	\$ 30,000.00	1	30,000
					<b>TOTAL</b>	<b>438,914</b>

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.



**Proposed Roadway System Improvements (D1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Install new gate at Jakes Creek Road	None available	each	\$ 1,000.00	1	1,000
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to foot of Wonderland Hotel steps	Boardwalks - elevated (railing not included) (3 feet minimum above grade)	linear foot	\$ 43.26	550	23,793
		Handrails (wood)	linear foot	\$ 26.00	550	14,300
7	Walking path on west side of Hotel steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
8	Walking path from Little River Trailhead to Spence (#42) cabin	Trails, gravel	square yard	\$ 18.20	367	6,673
8	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
9	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
10	Two lane asphalt road up to Wonderland Club from Elkmont Road	Road - asphalt surface, two lane	mile	\$ 592,000	0.142	84,064
11	Road widening at Wonderland Hotel driveway	Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	400	2,160
		Base Grading, complete	square yard	\$ 6.65	350	2,328
		Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
12	One lane road from Wonderland parking lot to Beaman (#58-8H) cabin	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	430	2,322
13	Repair gravel on Catron Branch Road to Paine (#58-2B) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.06	28,020
14	Second lane construction at Millionaire's Row in parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	427	2,306
<b>TOTAL</b>						<b>365,150</b>

**Water System Improvements (D1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	6" diameter water line to Wonderland Hotel area	Polyvinyl Chloride (PVC) Pipe - 6 inch C900	linear foot	\$ 38.90	7,500	291,750
2	Gate valve with box - 6 inch	Gate valve with box - 6 inch	each	\$ 973.00	7	6,811
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	6,000	18,000
4	Roadway pavement repair including #57 stone backfill	None available	linear foot	\$ 25.00	400	10,000
5	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1,300	40,820
6	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	3	2,337
7	2" blow-off including valve and box	None available	each	\$ 700.00	2	1,400
8	Air release valve (1 inch - 2 inch) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	2	9,520
9	Water service tap and service line	None available	each	\$ 1,500.00	7	10,500
<b>TOTAL</b>						<b>391,138</b>

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000

**Total for Alternative D1 (2004): \$1,507,838**



**Elkmont Historic District**  
**Preliminary Capital Cost Estimate: Alternative D2**

**Proposed Parking Improvements (D2)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Upper Wonderland Hotel parking lot	Parking Area - Paved 26-50 cars	space	\$ 1,950.00	50	97,500
2	Orientation Area parking lot	Parking Area - Paved 1-25 cars	space	\$ 2,160.00	25	54,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - Sparse	acre	\$ 3,790.00	0.2	758
3	Appalachian Clubhouse Lot	Parking Area - Paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	5,400
4	Along Millionaire's Row	Parking Area - Paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - Sparse	acre	\$ 3,790.00	0.15	569
5	Parking at former cabins 12,14,16,& 17	Parking Area - Paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,800	9,720
		Clearing and Grubbing - Sparse	acre	\$ 3,790.00	0.4	1,516
6	Parking spaces at cabins	Parking Area - Paved 1-25 cars	space	\$ 2,160.00	12	25,920
7	Striping	Striping	linear foot	\$ 1.25	3,500	4,375
8	Infiltration Trench	None available				
9	Gravel/Sand Layer, lined w/geotextile fabric, 2' Width, 3' Depth	None available	cubic foot	\$ 2.50	5,820	14,550
10	Parking Wheel Stops - Precast		each	\$ 81.00	176	14,256
					<b>TOTAL</b>	<b>420,504</b>

**Wastewater System Improvements (D2)**

ITEM	NPS Description		Unit	Unit Price	Qty	Total
1	8" Dia. Sewer Line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	1,200	62,280
2	8" Dia. Sewer Line Under Jake's Creek	Ductile Iron Sewer Pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	4" Dia. Sewer Service Line	PVC Sewer Pipe D3034 - 4 inch	linear foot	\$ 27.00	100	2,700
4	6" Dia. Sewer Service Line	PVC Sewer Pipe D3034 - 6 inch	linear foot	\$ 38.90	100	3,890
5	Standard Manhole	Standard Manhole	each	\$ 3,140.00	8	25,120
6	2" Dia. Low Pressure Sewer Line	Polyvinyl Chloride (PVC) Pipe - 2 inch D2241	linear foot	\$ 21.60	750	16,200
7	3" Dia. Pressure Force Main	Polyvinyl Chloride (PVC) Pipe - 3 inch D2241	linear foot	\$ 29.20	3,200	93,440
8	Sewage Lift Station - single residence	None available	each	\$ 7,790.00	4	31,160
9	Sewage Pump Station (wetwell and dual pumps) - large	None available	each	\$ 173,100.00	1	173,100
10	Connection to Existing Sewer System	None available	each	\$ 1,000.00	2	2,000
11	Asphalt Repair	None available	linear foot	\$ 30.00	25	750
12	Flow Equalization Basin	None available	lump sum	\$ 30,000.00	1	30,000
					<b>TOTAL</b>	<b>442,804</b>

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.



Proposed Roadway System Improvements (D2)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Install new gate at Jakes Creek Road	None available	each	\$ 1,000.00	1	1,000
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to foot of Wonderland Hotel steps	Boardwalks - elevated (railing not included) (3 feet minimum above grade)	linear foot	\$ 43.26	550	23,793
7	One lane road through Orientation parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0379	22,437
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	500	2,700
8	Walking path on west side of steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
9	Walking path from Little River Trailhead to Spence (#42) cabin	Trails, gravel	square yard	\$ 18.20	367	6,673
10	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
11	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
12	Two lane asphalt road up to Wonderland Hotel from Elkmont Road	Road - asphalt surface, two lane	mile	\$ 592,000	0.142	84,064
13	Road widening at Wonderland Hotel driveway	Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	400	2,160
		Base Grading, complete	square yard	\$ 6.65	350	2,328
		Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
14	One lane road from Wonderland parking lot to Beaman (#58-8H) cabin	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	430	2,322
15	Repair gravel on Catron Branch Road to Paine (#58-2B) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.06	28,020
16	Second lane construction at Millionaire's Row in parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	427	2,306
<b>TOTAL</b>						<b>375,986</b>

Water System Improvements (D2)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter water line to Wonderland Hotel area	Polyvinyl Chloride (PVC) Pipe - 8 inch C900	linear foot	\$ 44.30	7,500	332,250
2	Gate valve with box - 8 inch	Gate valve with box - 8 inch	each	\$ 1,244.00	7	8,708
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	6,400	19,200
4	Roadway pavement repair including #57 stone backfill	None available	linear foot	\$ 25.00	400	10,000
5	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1,300	40,820
6	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	3	2,337
7	2" blow-off including valve and box	None available	each	\$ 700.00	2	1,400
8	Air release valve (1 inch - 2 inch) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	2	9,520
9	Water service tap and service line	None available	each	\$ 1,500.00	9	13,500
					<b>TOTAL</b>	<b>437,735</b>

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.

**Total for Alternative D2 (2004):**

**\$1,677,029**



**Elkmont Historic District**  
**Preliminary Capital Cost Estimate: Alternative E1**

**Proposed Parking Improvements (E1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Orientation Area parking lot	Parking Area - paved 1-25 cars	space	\$ 2,160.00	25	54,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.2	758
2	Appalachian Clubhouse Lot	Parking Area - paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1000	5,400
3	Along Millionaire's Row	Parking Area - paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
4	Parking at former cabins 12,14,16,& 17	Parking Area - paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
5	Parking spaces at cabins	Parking Area - paved 1-25 cars	space	\$ 2,160.00	12	25,920
6	Striping	Striping	linear foot	\$ 1.25	2,500	3,125
7	Infiltration trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic feet	\$ 2.50	4,020	10,050
8	Parking wheel stops - precast	Parking wheel stops - precast	each	\$ 81.00	126	10,206
					<b>TOTAL</b>	<b>313,204</b>

**Wastewater System Improvements (E1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter sewer line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	1,200	62,280
2	8" diameter sewer line under Jakes Creek	Ductile iron sewer pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	4" diameter sewer service line	PVC Sewer Pipe D3034 - 4 inch	linear foot	\$ 27.00	400	10,800
4	Standard manhole	Standard manhole	each	\$ 3,140.00	8	25,120
5	2" diameter low pressure sewer line	Polyvinyl Chloride (PVC) Pipe - 2 inch D2241	linear foot	\$ 21.60	600	12,960
6	3" diameter pressure force main	Polyvinyl Chloride (PVC) Pipe - 3 inch D2241	linear foot	\$ 29.20	5,560	162,352
7	3" diameter pressure force main under Bearwallow Branch	Ductile iron sewer pipe - 4 inch	linear foot	\$ 26.10	40	1,044
8	Sewage lift station - single residence	Sewage lift station - single residence	each	\$ 7,790.00	9	70,110
9	Sewage pump station (wetwell and dual pumps) - large	Sewage pump station (wetwell and dual pumps) - large	each	\$ 173,100.00	1	173,100
10	Connection to existing sewer system	None available	each	\$ 1,000.00	2	2,000
11	Asphalt repair	None available	linear foot	\$ 30.00	200	6,000
12	Flow Equalization Basin	None available	lump sum	\$ 30,000.00	1	30,000
13	Wastewater treatment plant expansion	None available	lump sum	\$ 300,000.00	1	300,000
					<b>TOTAL</b>	<b>857,930</b>

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**Proposed Roadway System Improvements (E1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Install new gate at Jakes Creek Road	None available	each	\$ 1,000.00	1	1,000
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to foot of Wonderland Hotel steps	Boardwalks - elevated (railing not included) (3 feet minimum above grade)	linear foot	\$ 43.26	550	23,793
7	One lane road through Orientation parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0379	22,437
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	500	2,700
8	Walking path on west side of steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
9	Walking path from Little River Trailhead to Spence (#42) cabin	Trails, gravel	square yard	\$ 18.20	367	6,673
10	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
11	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
12	Two lane asphalt road up to Wonderland Hotel from Elkmont Road	Road - asphalt surface, two lane	mile	\$ 592,000	0.142	84,064
13	Road widening at Wonderland Hotel driveway	Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	400	2,160
		Base Grading, complete	square yard	\$ 6.65	350	2,328
		Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
14	One lane road from Wonderland parking lot to Beaman (#58-8H) cabin	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	430	2,322
15	Repair gravel on Catron Branch Road to Paine (#58-2B) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.0473	22,089
16	Second lane construction at Millionaire's Row in parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	427	2,306
17	Asphalt repair/one lane overlay at Millionaire's Row up to Cambier (#49) cabin	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,556	50,570
<b>TOTAL</b>						<b>420,625</b>

**Water System Improvements (E1)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	6" diameter water line to Wonderland Hotel area	Polyvinyl Chloride (PVC) Pipe - 6 inch C900	linear foot	\$ 38.90	7,500	291,750
2	Gate valve with box - 6 inch	Gate valve with box - 6 inch	each	\$ 973.00	7	6,811
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	8,500	25,500
4	Roadway pavement repair including #57 stone backfill	None available	linear foot	\$ 25.00	400	10,000
5	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1,300	40,820
6	4" diameter water line to Millionaire's Row area and new well site	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	2,860	89,804
7	4" diameter water line under Bearwallow Branch	Ductile iron pipe - 4 inch	linear foot	\$ 28.10	40	1,124
8	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	7	5,453
9	2" blow-off including valve and box	None available	each	\$ 700.00	2	1,400
10	Air release valve (1 inch - 2 inch) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	3	14,280
11	Water service tap and service line	None available	each	\$ 1,500.00	14	21,000
12	Additional well	None available	each	\$ 35,000.00	1	35,000
<b>TOTAL</b>						<b>542,942</b>

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**Total for Alternative E1 (2004): \$ 2,134,701**



**Elkmont Historic District**  
**Preliminary Capital Cost Estimate: Alternative E2**

**Proposed Parking Improvements (E2)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Parking lot across the river from the Wonderland Hotel	Parking Area - paved 51-200 cars	space	\$ 1,840	75	138,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	2,700	14,580
2	Upper Wonderland Hotel parking lot	Parking Area - paved 26-50 cars	space	\$ 1,950.00	50	97,500
3	Orientation Area parking lot	Parking Area - paved 1-25 cars	space	\$ 2,160.00	25	54,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.2	758
4	Appalachian Clubhouse Lot	Parking Area - paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	
5	Along Millionaire's Row	Parking Area - paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
6	Parking at former cabins 12,14,16,& 17	Parking Area - paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
7	Parking spaces at cabins	Parking Area - paved 1-25 cars	space	\$ 2,160.00	12	25,920
8	Striping	Striping	linear foot	\$ 1.25	5,000	6,250
9	Infiltration trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic foot	\$ 2.50	8,220	20,550
10	Parking wheel stops - precast	Parking wheel stops - precast	each	\$ 81.00	251	20,331
					<b>TOTAL</b>	<b>581,634</b>

**Wastewater System Improvements (E2)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter sewer line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	1,200	62,280
2	8" diameter sewer line under Jakes Creek	Ductile iron sewer pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	4" diameter sewer service line	PVC Sewer Pipe D3034 - 4 inch	linear foot	\$ 27.00	400	10,800
4	6" diameter sewer service line	PVC Sewer Pipe D3034 - 6 inch	linear foot	\$ 36.80	100	3,680
5	Standard manhole	Standard manhole	each	\$ 3,140.00	8	25,120
6	2" diameter low pressure sewer line	Polyvinyl Chloride (PVC) Pipe - 2 inch D2241	linear foot	\$ 21.60	600	12,960
7	3" diameter pressure force main	Polyvinyl Chloride (PVC) Pipe - 3 inch D2241	linear foot	\$ 29.20	5,560	162,352
8	3" diameter pressure force main under Bearwallow Branch	Ductile iron sewer pipe - 4 inch	linear foot	\$ 26.10	40	1,044
9	Sewage lift station - single residence	Sewage lift station - single residence	each	\$ 7,790.00	9	70,110
10	Sewage pump station (wetwell and dual pumps) - large	Sewage pump station (wetwell and dual pumps) - large	each	\$ 173,100.00	1	173,100
11	Connection to existing sewer system	None available	each	\$ 1,000.00	2	2,000
12	Asphalt repair	None available	linear foot	\$ 30.00	200	6,000
13	Flow equalization basin	None available	lump sum	\$ 30,000.00	1	30,000
14	Wastewater treatment expansion: drip irrigation*	None available	lump sum	\$ 349,600.00	1	349,600
					<b>TOTAL</b>	<b>911,210</b>

\* assumes suitable drip irrigation site available within one mile of Elkmont Historic District; includes extra 15% for additional environmental studies, if needed

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## Road System Improvements (E2)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Install new gate at Jakes Creek Road	None available	each	\$ 1,000.00	1	1,000
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to foot of Hotel steps	Boardwalks - elevated (railing not included) (3 feet minimum above grade)	linear foot	\$ 43.26	800	34,608
7	One lane road through Orientation parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0379	22,437
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	500	2,700
8	Walking path on west side of steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
9	Walking path from Little River Trailhead to Spence (#42) cabin	Trails, gravel	square yard	\$ 18.20	367	6,673
10	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
11	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
12	Two lane asphalt road up to Wonderland Hotel	Road - asphalt surface, two lane	mile	\$ 592,000	0.142	84,064
13	Road widening at Wonderland Hotel driveway	Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	400	2,160
		Base Grading, complete	square yard	\$ 6.65	350	2,328
		Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
14	One lane road from Wonderland parking lot to Beaman (#58-8H) cabin	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	430	2,322
15	Repair gravel on Catron Branch Road to Paine (#58-2B) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.0473	22,089
16	Second lane construction at Millionaire's Row in parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	427	2,306
17	Asphalt repair/one lane overlay at Millionaire's Row up to Cambier (#49) cabin	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,556	50,570
18	New two-lane bridge over Little River w/ pedestrian lane	Vehicle Bridge (price is calculated per square foot of surface)	square foot	\$108.00	3,780	408,240
19	Walking path from Wonderland overflow parking lot	Trails, gravel	square yard	\$18.20	533	9,701
					TOTAL	849,381

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.



Water System Improvements (E2)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter water line to Wonderland Hotel area	Polyvinyl Chloride (PVC) Pipe - 8 inch C900	linear foot	\$ 44.30	7,500	332,250
2	Gate valve with box - 8 inch	Gate valve with box - 8 inch	each	\$ 1,244.00	7	8,708
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	8,900	26,700
4	Roadway pavement repair including #57 stone backfill	None available	linear foot	\$ 25.00	400	10,000
5	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1,300	40,820
6	4" diameter water line to Millionaire's Row area and new well site	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	2,860	89,804
7	4" diameter water line under Bearwallow Branch	Ductile iron pipe - 4 inch	linear foot	\$ 28.10	40	1,124
8	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	7	5,453
9	2" blow-off including valve & box	None available	each	\$ 700.00	2	1,400
10	Air release valve (1 in - 2 in) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	3	14,280
11	Water service tap and service line	None available	each	\$ 1,500.00	16	24,000
12	Additional well	None available	each	\$ 35,000	1	35,000
					<b>TOTAL</b>	<b>589,539</b>

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.

**Total for Alternative E2 (2004): \$2,931,764**



Elkmont Historic District  
Preliminary Capital Cost Estimate: Alternative F1

Proposed Parking Improvements (F1)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Orientation Area parking lot	Parking Area - paved 1-25 cars	space	\$ 2,160.00	25	54,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	900	4,860
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.2	758
2	Appalachian Clubhouse Lot	Parking Area - paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	5,400
3	Along Millionaire's Row	Parking Area - paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
4	Parking at former cabins 12,14,16,& 17	Parking Area - paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
5	New trailhead parking in front of Kuhlman (#40) cabin	Parking Area - gravel	space	\$ 920	20	18,400
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	650	3,510
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
6	Parking spaces at cabins	Parking Area - paved 1-25 cars	space	\$ 2,160.00	81	174,960
7	Striping	Striping	linear foot	\$ 1.25	4,600	5,750
8	Infiltration trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic foot	\$ 2.50	8,220	20,550
10	Parking wheel stops - precast	Parking wheel stops - precast	each	\$ 81.00	230	18,630
					<b>TOTAL</b>	<b>506,271</b>

Wastewater System Improvements (F1)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter sewer line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	2,400	124,560
2	8" diameter sewer line under Jakes Creek	Ductile iron sewer pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	4" diameter sewer service line	PVC Sewer Pipe D3034 - 4 inch	linear foot	\$ 27.00	3,000	81,000
4	Standard manhole	Standard manhole	each	\$ 3,140.00	16	50,240
5	2" diameter low pressure sewer line	Polyvinyl Chloride (PVC) Pipe - 2 inch D2241	linear foot	\$ 21.60	600	12,960
6	3" diameter pressure force main	Polyvinyl Chloride (PVC) Pipe - 3 inch D2241	linear foot	\$ 29.20	6,760	197,392
7	3" diameter pressure force main under Bearwallow Branch	Ductile iron sewer pipe - 4 inch	linear foot	\$ 26.10	40	1,044
8	Sewage lift station - single residence	Sewage lift station - single residence	each	\$ 7,790.00	11	85,690
9	Sewage pump station (wetwell and dual pumps) - large	Sewage pump station (wetwell and dual pumps) - large	each	\$ 173,100.00	1	173,100
10	Connection to existing sewer system	None available	each	\$ 1,000.00	2	2,000
11	Asphalt repair	None available	linear foot	\$ 30.00	300	9,000
12	Flow equalization basin	None available	lump sum	\$ 30,000.00	1	30,000
13	Wastewater treatment expansion: drip irrigation*	None available	lump sum	\$ 349,600.00	1	349,600
<b>TOTAL CONSTRUCTION COSTS</b>					<b>TOTAL</b>	<b>1,118,750</b>

\* assumes suitable drip irrigation site available within one mile of Elkmont Historic District; includes extra 15% for additional environmental studies, if needed

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.



**Proposed Roadway System Improvements (Fr)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Install new gate at Jakes Creek Road	None available	each	\$ 1,000.00	1	1,000
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to foot of Hotel steps	Boardwalks - elevated (railing not included) (3 feet minimum above grade)	linear foot	\$ 43.26	800	34,608
7	One lane road through Orientation parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0379	22,437
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	500	2,700
8	Walking path on west side of steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
9	Walking path from Little River Trailhead to Spence (#42) cabin	Trails, gravel	square yard	\$ 18.20	367	6,673
10	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
11	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
12	Two lane asphalt road up to Wonderland Hotel	Road - asphalt surface, two lane	mile	\$ 592,000	0.142	84,064
13	Road widening at Wonderland Hotel driveway	Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	400	2,160
		Base Grading, complete	square yard	\$ 6.65	350	2,328
		Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
14	One lane road from Wonderland parking lot to Beaman (#58-8H) cabin	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	430	2,322
15	Repair gravel one lane Catron Branch Road past the Wonderland Hotel from Beaman (#58-8H) cabin to Richards (#58-9I) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.0473	22,089
16	Second lane construction at Millionaire's Row in parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	427	2,306
17	Asphalt repair/one lane overlay at Millionaire's Row up to Cambier (#49) cabin	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,556	50,570
18	Repair gravel on Catron Branch Road to Paine (#58-2B) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.0473	22,089
19	Walking path from Wonderland overflow parking lot	Trails, gravel	square yard	\$18.20	533	9,701
20	New two-lane bridge over Little River w/ pedestrian lane	Vehicle Bridge (price is calculated per square foot of surface)	square foot	\$ 108	3,780	408,240
<b>TOTAL</b>						<b>871,470</b>

**Water System Improvements (Fr)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	6" diameter water line to Wonderland Hotel area	Polyvinyl Chloride (PVC) Pipe - 6 inch C900	linear foot	\$ 38.90	7,500	291,750
2	Gate valve with box - 6 inch	Gate valve with box - 6 inch	each	\$ 973.00	7	6,811
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	11,300	33,900
4	Roadway pavement repair including #57 stone backfill	None available	linear foot	\$ 25.00	400	10,000
5	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1,300	40,820
6	4" diameter water line to Millionaire's Row area and new well site	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	2,860	89,804
7	4" diameter water line under Bearwallow Branch	Ductile iron pipe - 4 inch	linear foot	\$ 28.10	40	1,124
8	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	7	5,453
9	4" diameter water line to Jakes Creek tank	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	3,400	106,760
10	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	4	3,116
11	2" blow-off including valve & box	None available	each	\$ 700.00	3	2,100
12	Air release valve (1 inch - 2 inch) w/ manhole	Air release valve (1 inch - 2 inch) w/ manhole	each	\$ 4,760.00	4	19,040
13	Water storage tank rehabilitation - Jakes Creek tank	None available	each	40,000	1	40,000
14	Water service tap and service line	None available	each	1,500	37	55,500
15	Booster station (from existing tanks to Jakes Creek tank)	None available	each	45,000	1	45,000
16	Additional well	None available	each	35,000	1	35,000
<b>TOTAL</b>						<b>786,178</b>

NPS descriptions are shaded. Those items for which the Class C Estimating Guide did not contain a similar item description are not shaded and an estimated unit cost has been developed using the average cost of recent projects in the Park and Means 2000.

**Total for Alternative Fr (2004): \$3,282,669**



**Elkmont Historic District**  
**Preliminary Capital Cost Estimate: Alternative F2**

**Proposed Parking Improvements (F2)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Parking lot across the river from the Wonderland Hotel	Parking Area - paved 51-200 cars	space	\$ 1,840.00	90	165,600
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	3,150	17,010
2	Upper Wonderland Hotel parking lot	Parking Area - paved 26-50 cars	space	\$ 1,950	50	97,500
3	Orientation Area parking lot	Parking Area - paved 1-25 cars	space	\$ 2,160.00	25	54,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,350	7,290
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.3	1,137
4	Appalachian Clubhouse Lot	Parking Area - paved 26-50 cars	space	\$ 1,950	24	46,800
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,000	5,400
5	Along Millionaire's Row	Parking Area - paved 26-50 cars	space	\$ 1,950	30	58,500
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	700	3,780
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
6	Parking at former cabins 12,14,16, & 17	Parking Area - paved 26-50 cars	space	\$ 1,950	40	78,000
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	1,800	9,720
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.4	1,516
7	New trailhead parking in front of Kuhlman (#40) cabin	Parking Area - gravel	space	\$ 920	20	18,400
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	650	3,510
		Clearing and Grubbing - sparse	acre	\$ 3,790.00	0.15	569
8	Parking spaces at cabins	Parking Area - paved 1-25 cars	space	\$ 2,160.00	81	174,960
9	Striping	Striping	linear foot	\$ 1.25	7,500	9,375
10	Infiltration trench	Gravel/sand layer, lined w/geotextile fabric, 2' width, 3' depth	cubic feet	\$ 2.50	8,220	20,550
11	Parking wheel stops - precast	Parking wheel stops - precast	each	\$ 81.00	375	30,375
					<b>TOTAL</b>	<b>804,560</b>

**Wastewater System Improvements (F2)**

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter sewer line	PVC Sewer Pipe D3034 - 8 inch	linear foot	\$ 51.90	2,400	124,560
2	8" diameter sewer line under Jakes Creek	Ductile iron sewer pipe - 8 inch	linear foot	\$ 54.10	40	2,164
3	4" diameter sewer service line	PVC Sewer Pipe D3034 - 4 inch	linear foot	\$ 27.00	3,000	81,000
4	6" diameter sewer service line	PVC Sewer Pipe D3034 - 6 inch	linear foot	\$ 36.80	100	3,680
5	Standard manhole	Standard manhole	each	\$ 3,140.00	16	50,240
6	2" diameter low pressure sewer line	Polyvinyl Chloride (PVC) Pipe - 2 inch D2241	linear foot	\$ 21.60	600	12,960
7	3" diameter pressure force main	Polyvinyl Chloride (PVC) Pipe - 3 inch D2241	linear foot	\$ 29.20	6,760	197,392
8	3" diameter pressure force main under Bearwallow Branch	Ductile iron sewer pipe - 4 inch	linear foot	\$ 26.10	40	1,044
9	Sewage lift station - single residence	Sewage lift station - single residence	each	\$ 7,790.00	11	85,690
10	Sewage pump station (wetwell and dual pumps) - large	Sewage pump station (wetwell and dual pumps) - large	each	\$ 173,100.00	1	173,100
11	Connection to existing sewer system	None available	each	\$ 1,000.00	2	2,000
12	Asphalt repair	None available	linear foot	\$ 30.00	300	9,000
13	Flow equalization basin	None available	lump sum	\$ 30,000.00	1	30,000
14	Wastewater treatment expansion: drip irrigation*	None available	lump sum	\$ 349,600.00	1	349,600
					<b>TOTAL</b>	<b>1,122,430</b>

\* assumes suitable drip irrigation site available within one mile of Elkmont Historic District; includes extra 15% for additional environmental studies, if needed

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Road System Improvements (F2)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	Asphalt repair/overlay down Daisy Town Loop Road between Jakes Creek Cemetery Road and Little River Road	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,111	36,108
2	Bank stabilization at existing culverts	None available	each	\$ 500.00	1	500
3	Relocate gate on Little River Road	None available	each	\$ 500.00	1	500
4	Install new gate at Jakes Creek Road	None available	each	\$ 1,000.00	1	1,000
5	Place gravel on Daisy Town walkway	Trails, gravel	square yard	\$ 18.20	733	13,347
6	Walking path from Orientation parking lot to foot of Hotel steps	Boardwalks - elevated (railing not included) (3 feet minimum above grade)	linear foot	\$ 43.26	800	34,608
7	One lane road through Orientation parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0379	22,437
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	500	2,700
8	Walking path on west side of steps to top of steps	Trails, gravel	square yard	\$ 18.20	267	4,853
9	Walking path from Little River Trailhead to Spence (#42) cabin	Trails, gravel	square yard	\$ 18.20	367	6,673
10	Little River Trailhead	Road - asphalt surface, two lane	mile	\$ 591,999	0.07	39,242
11	Orientation Parking Area access road	Road - asphalt surface, two lane	mile	\$ 592,000	0.08	44,848
12	Two lane asphalt road up to Wonderland Hotel	Road - asphalt surface, two lane	mile	\$ 592,000	0.142	84,064
13	Road widening at Wonderland Hotel driveway	Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	400	2,160
		Base Grading, complete	square yard	\$ 6.65	350	2,328
		Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
14	One lane road from Wonderland parking lot to Beaman (#58-8H) cabin	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	430	2,322
15	Repair gravel one lane Catron Branch Road past the Wonderland Hotel from Beaman (#58-8H) cabin to Richards (#58-9I) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.0473	22,089
16	Second lane construction at Millionaire's Row in parking area	Road - asphalt surface, two lane	mile	\$ 592,000	0.0331	19,595
		Site Preparation - minor grading - top 2-3 inches	square yard	\$ 5.40	427	2,306
17	Asphalt repair/one lane overlay at Millionaire's Row up to Cambier (#49) cabin	Resurface Road (site preparation, tack coat, 2-inch mat, seal and chip)	square yard	\$ 32.50	1,556	50,570
18	Repair gravel on Catron Branch Road to Paine (#58-2B) cabin	Road - gravel surface, two lane	mile	\$ 467,000	0.0473	22,089
19	Walking path from Wonderland overflow parking lot	Trails, gravel	square yard	\$18.20	533	9,701
20	New two-lane bridge over Little River w/ pedestrian lane	Vehicle Bridge (price is calculated per square foot of surface)	square foot	\$ 108	3,780	408,240
					<b>TOTAL</b>	<b>871,470</b>

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Water System Improvements (F2)

ITEM	Description	NPS Description	Unit	Unit Price	Qty	Total
1	8" diameter water line to Wonderland Hotel area	Polyvinyl Chloride (PVC) Pipe - 8 inch C900	linear foot	\$ 44.30	7,500	332,250
2	Gate valve with box - 8 inch	Gate valve with box - 8 inch	each	\$ 1,244.00	7	8,708
3	Compact ductile iron fittings and thrust blocks	None available	pounds	\$ 3.00	11,700	35,100
4	Roadway pavement repair including #57 stone backfill	None available	linear foot	\$ 25.00	400	10,000
5	4" diameter water line to Daisy Town area	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	1,300	40,820
6	4" diameter water line to Millionaire's Row area and new well site	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	2,860	89,804
7	4" diameter water line under Bearwallow Branch	Ductile iron pipe - 4 inch	linear foot	\$ 28.10	40	1,124
8	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	7	5,453
9	4" diameter water line to Jakes Creek tank	Polyvinyl Chloride (PVC) Pipe - 4 inch C900	linear foot	\$ 31.40	3,400	106,760
10	Gate valve with box - 4 inch	Gate valve with box - 4 inch	each	\$ 779.00	4	3,116
11	2" blow-off including valve and box	None available	each	\$ 700.00	3	2,100
12	Air release valve (1 in - 2 in) w/ manhole	Air release valve (1 inch - 2 inch) with manhole	each	\$ 4,760.00	4	19,040
13	Water storage tank rehabilitation - Jakes Creek tank	None available	each	\$ 40,000.00	1	40,000
14	Water service tap and service line	None available	each	\$ 1,500.00	39	58,500
15	Booster station (from existing tanks to Jakes Creek tank)	None available	each	\$ 45,000.00	1	45,000
16	Additional well	None available	each	\$ 35,000.00	1	35,000
					<b>TOTAL</b>	<b>832,775</b>

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**TOTAL FOR ALTERNATIVE F2 (2004): \$3,631,235**