

**U.S. Department of the Interior  
National Park Service**

**Section 106 Documentation for the  
Proposed Installation of Substitute Material Shingles  
on CCC-era Buildings at  
Prince William Forest Park  
Triangle, Virginia**

**Description of Historic Properties**

A unit of the National Park Service (NPS), Prince William Forest Park, which was originally named Chopawamsic Recreational Demonstration Area (RDA), was established in 1936 as a model RDA for the RDA program. The RDA program was developed as a New Deal initiative to provide recreational experiences in nature for urban dwellers, reduce unemployment, and restore exhausted agricultural lands. In 1933, two pieces of legislation were passed, the Federal Emergency Relief Act (FERA) and the Emergency Conservation Work Act (ECW), which established the RDA program and the Civilian Conservation Corps respectively. The National Park Service also instituted formalized design guidelines for the construction of buildings and landscapes within RDAs with the publication of Albert Good's *Park Structures and Facilities* in 1935.

By 1935, Civilian Conservation Corps (CCC) and Works Progress Administration (WPA) workers had arrived at Chopawamsic Recreational Demonstration Area to begin the construction of five cabin camps, among other facilities. During 1935-1942, the CCC and WPA crews constructed over 250 structures, sites, roads, trails, and other contributing structures in (Chopawamsic) Prince William Forest Park. Each of the park's cabin camps features a dining hall, infirmary, administration building, craft lodges, bath houses, and sleeping quarters.

Consistent with Good's *Park Structures and Facilities*, buildings at Chopawamsic were constructed with indigenous materials from the area, including lumber from pine, oak, and cedar trees to make the structures harmonious with the environment. Wood was cut and hewn into "waney board" to use as siding or milled to create wooden roof shake shingles (shakes). All the buildings are single story in height, rest on pier foundations, and have a cross, "T," "H," or rectangular floor plans. The camps are also noted for their spatial organization and circulation. The building clusters rest on smaller plateaus, while the wider ridge tops are reserved for play fields. Each camp is nestled in areas where the forest can provide shade and the units have some distance between them to create a more intimate environment for campers.

Cabin Camps 1-4 are listed separately on the National Register of Historic Places, with local and statewide significance under Criterion A for their association with New Deal era work relief programs that were used in creating the Chopawamsic Recreational Demonstration Area (RDA). These buildings also meet Criterion C for their rustic style architecture, as exemplified in the use of indigenous materials, natural landscape, and design associated with the Emergency

Conservation Works Act (ECW) and American Park Movement. In 2010, Prince William Forest Park Historic District was nominated for listing to the National Register of Historic Places as a Historic District with national significance for its association as a model RDA and its role in the development and training for the Office of Strategic Services (OSS) during World War II. This nomination expanded upon the previous listings and included 170 structures from Camps 1-5 as contributing to the historic district. This nomination has been accepted by the Virginia State Historic Preservation Officer and is awaiting review by the Keeper of the National Register.

### **Developmental History of Roofing Material at Prince William**

Originally, wood shake shingles were installed on all cabin structures by the Civilian Conservation Corps (CCC). Local cedar, pine, or oak were milled or hewn into 24 or 26 inch shakes. These wood shakes were replaced by the OSS in effort to “winterize” the structures beginning in 1942. The wood shakes were removed and replaced with “mottled grey” asbestos containing material (ACM) shingles. With the ban of ACM shingles during the 1970s, park staff began to apply a variety of asphalt shingle styles and colors. Roll roofing and three-tab asphalt shingles of maroon, green, black, or grey coloration were installed during this time. Beginning in the 1980s, park staff shifted towards the use of three-tab oak colored asphalt shingles in effort to provide the impression of a wood shake shingle. In approximately 2004, park staff began to install architectural grade, oak colored, asphalt shingles. The architectural-grade shingles (also known as dimensional shingles) are asphalt shingles that are produced with a heavier thickness, which gives the shingles a stronger, three-dimensional, appearance. The architectural grade shingles were selected in an effort to return to the character of the building’s original wood shakes. The architectural grade shingles were last installed in 2010; they have been determined to be inappropriate by the cultural resources staff of the NPS, National Capital Regional Office (NCRO). Currently, three-tab asphalt shingles in black, grey, green, and oak colors exist in the park, as well as oak colored architectural grade asphalt shingles.

### **Description of Proposed Undertaking**

NPS staff at Prince William Forest Park proposes to replace all deteriorated roof shingles that fall within the 1936-1941 era with a composite roofing shingle that mimics the visual qualities of cedar/wood shake. This particular shingle product is manufactured by *Enviroshake, LLC*, which has been in business since 1998. The product is composed of 95% recycled materials, including a mixture of post-industrial plastic, recycled rubber, elastomers, and natural wood fibers. Upon installation, the shingle is dark grey and weathers to a silvery grey within 3-9 months. The product has a lifetime warranty for up to 50 years. The shingles are installed in the same manner as authentic wood shake shingles. The *Enviroshake* product is the park’s preferred alternative because of its resemblance to cedar shakes, life expectancy, installation method, maintenance, cost, and sustainable properties.

The buildings that would be affected by the proposed undertaking are those buildings in Cabin Camps 1,2,3,4, and 5 that have been listed on the National Register of Historic Places or that have been determined to be eligible for listing on the National Register. The proposed undertaking does not include buildings constructed by the OSS or buildings constructed during later phases of development at Prince William Forest Park. The NPS proposes to replace roof

shingles on the historic buildings on a cyclical basis as the existing materials reach the end of their life cycle. During fiscal year 2012, new shingles are proposed to be installed on the Central Bath unit in Cabin Camp 4 (building #95), replacing a three-tab green color asphalt shingle.

Through this proposed undertaking, the Park also proposes to return to a more appropriate roofing material that maintains the character of the rustic style architecture originally used on the camp buildings, as well as to provide for the long-term preservation of these historic buildings. The park also proposes to use sustainable materials that will assist in lowering its carbon footprint in accordance with the NPS “Call to Action”, which challenges the NPS to find suitable methods to introduce sustainability in historic preservation efforts.

## **Alternatives Considered**

Beginning in late 2009, NPS staff at Prince William Forest Park began investigations to determine an appropriate roofing material for use on the historic CCC structures for current and future facility maintenance projects. In planning the proposed undertaking, staff considered the options of returning to the original material of wood shakes, continuation of three-tab asphalt shingles (in use since the OSS era), and new and emerging compatible and sustainable roofing materials. Through this process, staff, in consultation with NPS staff at the National Capital Regional Office (NCRO) and Washington Support Office (WASO), considered the defining characteristics of the original historic fabric, discussed the maintenance needs and costs of preserving the roofing systems for over 200 buildings, and examined the appropriateness of substitute materials. A complete scoping chronology may be found in the attached submittal package, which was submitted to the SHPO. A description of alternatives considered is outlined below.

### **Roofing Materials Considered but Rejected**

#### **Cedar Shake**

The Civilian Conservation Corps (CCC) structures at Prince William Forest Park were originally constructed with wood shakes made from cedar or other indigenous woods. NPS staff considered returning to the use of authentic cedar shakes. Before determining which material would be used, the park facilities maintenance and cultural resource staff attended a seminar by the Cedar Shake and Shingle Bureau. Staff also consulted with NPS staff at Catoctin Mountain Park (CATO) about the installation, cost, and maintenance of the cedar shake shingle roofs, as were originally used on CCC era cabins at CATO. Through this consultation, staff at Prince William Forest Park determined that the use of authentic cedar shake shingles would be fiscally prohibitive because not only of the cost of the materials themselves, but also because of the frequency with which these would need to be replaced. In addition, to provide for the annual topical preventative maintenance and cleaning that would be required to keep the cedar shake free of moss and mildew; this would require a substantial cost in terms of salaries or contracts and dedicated personnel. This was determined to also be fiscally prohibitive.

#### **Asphalt**

A “mottled grey” ACM shingle replaced the original wood shake shingles in the early 1940s under the OSS occupation of park facilities. Different techniques have been used to install asphalt shingles of various colors and styles. Staff investigated variations of a “warm grey” asphalt shingle that would attempt to mimic an aged cedar shake. Staff selected and installed “Heatherblend” and “Weathered Wood” from manufacturer *CertainTeed* on an existing structure in Cabin Camp 3 for a mock-up demonstration. However, after the mock-up of the selected shingles was completed, park staff consulted with NCRO and WASO cultural resource and historic preservation staff, whom agreed that this was not the most appropriate substitute material shingle, as it did not match the appearance and visual qualities of wood shake.

#### DaVinci Roofscapes

Staff also considered a substitute shingle product from *DaVinci Roofscapes*. The DaVinci shake shingles are made from virgin synthetic materials and are 100% recyclable. Staff conducted a site visit in Fairfax, Virginia to view this product installed on a structure. This product was eliminated from further evaluation after this site visit; the shingles did not resemble actual wood, the shingles were too heavily grooved to match the texture of wood shake, were too uniform in appearance, and coloration did not match historical, actual, or desired conditions.

#### EcoStar, LLC products

Staff explored the option of an *EcoStar, LLC* Seneca Plus product, a shingle made from post-industrial recycled rubber and plastics. Staff conducted a site visit to view this product installed on local townhomes. The material had a compatible thickness and style of original wood shake, leading the park to install a mock-up of *Ecostar* shingles on a small portion of an existing cabin. Based on this on-site mock-up, this product was not selected because the color selection did not match a weathered shake, the shingles did not resemble actual wood, and exhibited a somewhat glossy sheen, even after exposure to weather over time.

### **Preferred Roofing Material**

#### Enviroshake, Inc.

Staff also considered an additional substitute material shingle made by *Enviroshake Inc*. This product is composed of 95% recycled materials, including a mixture of postindustrial plastic, recycled rubber, elastomers, and natural wood fibers. Upon installation, the shingle is dark grey and weathers to a silvery color within 3-9 months. The product has a lifetime warranty for up to 50 years. The shingles are installed in the same manner as actual wood shake shingles. The *Enviroshake* shingles are the park’s preferred shingle alternative because of their resemblance to cedar shake, life expectancy, installation method, maintenance, cost, and sustainable properties.

Park staff consulted the newly reissued *Secretary of Interior Standards for Rehabilitation & Guidelines on Sustainability for Rehabilitation Historic Structures*. According to Standard 5, “*Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.*” The original wood shake shingles that once contributed to the Park’s historic and rustic architecture were replaced beginning in the 1940s

with ACM shingles, roll roofing, and asphalt shingles. Though these later roofing materials are considered historic materials in their own right, park staff proposed to discontinue the use of asphalt shingles on CCC era structures and rather use materials that would match the appearance of the original wood shake roofs.

Park staff also consulted Preservation Brief 16 – *The Use of Substitute Materials on Historic Building Exteriors*. According to Preservation Brief 16, there are some cases in which substitute materials are appropriate. In the case of Prince William Forest Park, the original wood shingles had been replaced with asphalt shingles beginning in the 1940s. Although wood shake shingles are still readily available and there are commercial contractors available and qualified to install this material, staff is unable to perform annual topical preventative maintenance and cleaning of authentic wood shake roofs, or to sustain the costs of replacing the wood shakes on a 10-15 year cycle for 200 structures. Thus, given the number of historic buildings in the park, the use of authentic wood shakes makes this material cost prohibitive, impractical, requires the dedication of personnel beyond the means of fiscal resources available, nor to be dedicated to this facility activity.

Preservation Brief 16 also states “[substitute materials] must be compatible with the historic materials in appearance; their physical properties must be similar to those of the historic materials, or be installed in a manner that tolerates differences; and they must meet certain basic performance expectations over an extended period of time.” By replacing the architectural dimensional shingles with the *Enviroshake* product, park staff believes that the NPS would be placing a more appropriate shingle on the park’s historic structures than the existing architectural grade asphalt shingles. The *Enviroshake* product would more closely resemble the variation, color, and texture of weathered wood shakes than the existing asphalt shingle material.

The NPS proposes to use the *Enviroshake* product on all CCC era buildings, which include cross-gabled and gabled roof systems on one-story buildings. Because these roofs would be readily visible, it is important that the substitute material most closely resemble actual wood shakes, something that the existing asphalt shingles fail to do. *Enviroshake* shingles are installed in the same manner as authentic wood shake shingles. In accordance with building code requirements, fasteners, flashings, underlayment, and roof ventilation will be included in the work specifications.

The *Enviroshake* shingles have the same weight as the previously used asphalt shingles and wood shakes. In addition, *Enviroshake* shingles are resistant to damage from UV light, moisture, and insects. According to the manufacturer, *Enviroshake* does not absorb moisture in excess of 3% and does not encounter freeze-thaw issues that are associated with traditional wood shakes. The product can also withstand a maximum of 110 mph winds. Thus, staff believes that the physical properties of the *Enviroshake* product are superior to the original wood shake roofing material. For these reasons, NPS issued its finding of no adverse effects on historic properties.

### **Determination of Adverse Effect**

The park submitted the proposed project and supporting documentation (see attached) to the Virginia SHPO on January 9, 2012. On February 8, 2012 the park received a letter from the

SHPO; the SHPO disagreed with the park finding of “no adverse effect” on historic properties as the SHPO stated that the proposed use of substitute material on CCC era structures was inconsistent with the Secretary of Interior’s *Standards for the Treatment of Historic Properties*. On March 7, the park notified the SHPO that it concurred that the proposed project would result in an adverse effect on the historic structures and that the NPS would consult with the SHPO and others to resolve the determination of an adverse effect.

**Copies of any Views Provided by Consulting Parties and the Public**

Copies of the views provided by consulting parties and the public are attached.

**U.S. Department of the Interior  
National Park Service**

**Investigation to find an appropriate roofing material for CCC era Structures**

**Prince William Forest Park  
Triangle, Virginia**

**BACKGROUND**

Beginning in late 2009, Prince William Forest Park began investigations to find an appropriate roofing material to replace the recently installed oak colored architectural shingles (circa 2004). The park considered returning to the original material of wood shake shingles, continuation of three-tab asphalt shingles from the Office of Strategic Services (OSS) era, as well as sustainable roofing materials. Through this process the park, in consultation with National Park Service Regional and Washington level staff, considered the defining characteristics of the original historic fabric, discussed the maintenance needs and costs of preserving over 200 roofing systems, and examined the appropriateness of substitute materials. A chronology of these efforts is presented below, along with the rationale for the park's preferred shingle alternative, and a chart comparing each shingle alternative.

**SCOPING CHRONOLOGY**

**2009**

In October 2009, the park initiated the project, "Rehabilitate Central Bath" for review in PEPC to rehabilitate the historic Central Bath unit in Cabin Camp 4. The project proposed replacing the roof system, re-plumbing/re-piping the building, replacing the gas hot water heater, adding ceramic tile, and remodeling aspects of the shower/toilet areas. Additionally, the park planned to create an ADA accessible bathroom by remodeling the existing storage area.

After a site visit from the National Capital Region (NCR) Historical Architect, the project was deemed an adverse effect because of the proposal to replace the existing green three-tab asphalt shingles with oak colored architectural shingles and remodeling aspects. The park revised the project scope and developed mitigations in consultation with NCR staff. However, the project was put on hold until an appropriate roofing material could be selected.

**2010**

The park's Cultural Resource Specialist, Buildings and Utilities Foreman, and Buildings and Utilities Supervisor attended a seminar by the Cedar Shake and Shingle Bureau on the basics of the material and installation in January 2010. Park staff gained insight on the installation, cost, and maintenance necessary for the use of cedar shake shingles.

The park Cultural Resource Specialist also consulted with the Resource Manager and Buildings and Utilities Foreman at Catoctin Mountain Park (CATO), where cedar shake shingles are currently in use on 30 cabins constructed by the Civilian Conservation Corps during the 1930s. CATO staff has difficulty maintaining the wood shingles due to limited staff. While the shingles were once treated with the necessary wood preservatives on a regular basis, this is no longer possible due to limited staffing and costs.

In February 2010, archival research was conducted in the park archives for information pertaining to the transition from cedar shake to asphalt shingles. Archival documents revealed that the OSS installed “mottled grey” asbestos asphalt shingles beginning in 1942.

In March 2010, the park hosted a Cabin Camp meeting with NCR Cultural Resource and Maintenance staff to discuss the preservation efforts and management strategies of the cabin camps. The park presented the research on the “mottled grey” shingle. The NCR and park staff agreed that the remaining architectural shingles would be used and thenceforth a grey asphalt shingle would be applied.

From April to August 2010, the park completed rehabilitation projects on a number of structures and installed the remaining architectural shingles.

In August 2010 the Central Bath project was approved by NCR regional staff and the park continued to submit rehabilitation projects for review. The park began research for asphalt shingles.

## **2011**

In January 2011 the SHPO provided concurrence on the rehabilitation project for Central Bath for the use of a “mottled grey” shingle.

On February 8, 2011 park staff met with NCR and WASO staff, including: Vidal Martinez, Superintendent (PRWI), George Liffert, Deputy Superintendent (PRWI), Paul Petersen, Chief of Resource Management (PRWI), Colette Carmouche, Cultural Resource Specialist (PRWI), Perry Wheelock, former Chief of Cultural Resources (NCR), Catherine Dewey, Architectural Conservator and Acting Historical Architect (NCR), Randy Biallis, Chief Historical Architect and Manager (WASO), Toni Lee, Assistant Associate Director of Historical Documentation Programs (WASO), and other associated WASO staff. The team discussed a collaborative effort to provide documentation in Cabin Camp 1 so that design guidelines for use and maintenance could be established.

On March 28, 2011 the park held a charette with various NCR and WASO Cultural Resource staff to discuss the feasibility and appropriateness of winterizing historic structures in Cabin Camp 1 of Prince William Forest Park. The topic of appropriate roofing shingles was discussed throughout this planning session.

On July 1, 2011 park staff (Paul Petersen and Colette Carmouche) met with NCR (Perry Wheelock and Catherine Dewey) and WASO (Randy Biallis) to discuss appropriate roofing for

the CCC structures. After reviewing the historical development of roofing shingles at PRWI, the group determined the park would investigate a “warm grey” asphalt shingle in effort to match the color of a weathered cedar shake, but remain with the asphalt material.

July 2011, the park researched various asphalt products and selected the “Heatherblend” shingle from CertainTeed.

August 2, NCR Catherine Dewey took a site visit to the park to review the park’s top choices.

On August 8, 2011 the NCR staff issued their recommendation of use of the “Weathered Wood” shingle from CertainTeed.

During August and September the park completed a mockup of the park’s preferred shingle and the NCR preferred shingle. The park also obtained samples of additional substitute shingle materials, including EcoStar.

On September 21, Randy Biallis, Perry Wheelcock, and Catherine Dewey viewed the mockup of asphalt and were presented with the additional option of using EcoStar. The use of asphalt shingles was dismissed.

In September and October of 2011 the park continued research on substitute shingles and conducted site visits to view three different shingle products including, DaVinci, Ecostar, and Enviroshake.

In October 2011 the park completed a mockup of the Ecostar and Enviroshake shingles.

On November 3, 2011 the park met with Catherine Dewey and Audrey Tepper, Historical Architect at the Technical Preservation Services Branch (WASO) to view the mockup of the Enviroshake and EcoStar.

On November 7, Colette Carmouche, Audrey Tepper, and Catherine Dewey conducted a site visit to view the Enviroshake product at a local site.

On November 8, 2011 NCR provided its concurrence that the park uses the Enviroshake product on all CCC era structures.

## **ROOFING MATERIALS CONSIDERED BUT DISMISSED**

### **Cedar Shake**

The Civilian Conservation Corps (CCC) structures at Prince William Forest Park were originally constructed with cedar or other indigenous wood. The park considered returning to use of cedar shake shingles. Selected park Maintenance and Cultural Resource staff attended a seminar by the Cedar Shake and Shingle Bureau. Park staff also corresponded with Catoctin Mountain Park (CATO) about the installation, cost, and maintenance of cedar shake, as cedar shake is used on CCC era cabins at CATO. Through this consultation it was determined that the return to cedar

shake would be economically prohibitive because of the cost of the materials and the frequency in which they would need to be replaced. In addition, the park staff would not be able to provide the annual maintenance required to keep the cedar shake free of moss and mildew.

### **Asphalt**

A “mottled grey” asbestos asphalt shingle replaced the original wood shake shingles in the early 1940s under the OSS. Different techniques have been used to install asphalt shingles of various colors and styles. The park investigated variations of a “warm grey” asphalt shingles that would attempt to mimic an aged cedar shake. The park selected and installed “Heatherblend” and “Weathered Wood” from CertainTeed on a structure in Cabin Camp 3 for a demonstration. However, after mockups of the selected shingles were completed, Park/NCR/WASO staff agreed that the asphalt was not the most appropriate substitute shingle, as it does not match the appearance and visual qualities of wood shake.

### **DaVinci**

The park also considered a substitute shingle product from DaVinci. The Seneca Plus shingles are made from virgin synthetic materials, but are 100% recyclable. The park conducted a site visit to view this product installed on a structure. However, this product was eliminated from further evaluation after this visit. The shingles were too heavily grooved to match texture of wood shake and too uniform in appearance.

### **EcoStar**

The park explored the option of the Ecostar product, a shingle made from post-industrial recycled rubber and plastics. Park staff conducted a site visit to view this product installed on local townhouses. The material had a compatible thickness and style of original wood shake, leading the park to install a mockup of Ecostar shingles. However, after installation the shingle was not selected because the color selection did not match a weathered shake and the shingles did not resemble actual wood.

## **PREFERRED ROOFING MATERIAL**

### **Enviroshake**

The Park also considered an additional substitute shingle made by Enviroshake Quality Engineered Roofing. The product is composed of 95% recycled materials, including a mixture of postindustrial plastic, recycled rubber, elastomers, and natural wood fibers. Upon installation the shingle is dark grey and weathers to a silvery color within 3-9 months. The product has a lifetime warranty and is fully transferable for up to 50 years. The shingles are installed in the same manner as actual wood shake shingles. The Enviroshake shingles are the park’s preferred shingle alternative because of their resemblance to cedar shake, life expectancy, sustainability, installation method, maintenance, and cost.

The Secretary of Interior Standards for Rehabilitation & the Guidelines on Sustainability for Rehabilitation Historic Structures, Standard 5 states, “*Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.*” The historic wood shake that contributed to the historic park architecture and rustic movement was replaced in the 1940s with asphalt shingles. The park aims to discontinue use of asphalt shingles on CCC era structures and use materials that would match the original historic fabric.

According to Preservation Brief 16 – *The Use of Substitute Materials on Historic Building Exteriors*, there are some cases in which substitute materials are appropriate. In the case of Prince William, the historic fabric was replaced with the non-character defining asphalt material. Although wood shake is still readily available and most contractors can install this material, the park is unable to perform yearly topical maintenance on actual wood shake roofs or sustain the costs of replacing these roofing systems every 10 years. The number of structures in the park contributing to the ECW architecture makes this material cost prohibitive.

Preservation Brief 16 also states “[substitute materials] must be compatible with the historic materials in appearance; their physical properties must be similar to those of the historic materials, or be installed in a manner that tolerates differences; and they must meet certain basic performance expectations over an extended period of time.”

By replacing the architectural dimensional shingles with the Enviroshake, the park would be placing a more appropriate shingle on the historic structures than the existing architectural shingles. The Enviroshake product would resemble the variation, color, and texture of weathered wood shake shingles.

This material would be applied to all CCC era structures, which include cross-gabled and gabled roof systems on one-story buildings. Because these roofs would be readily visible, it is necessary that the substitute material most closely resemble actual wood shake.

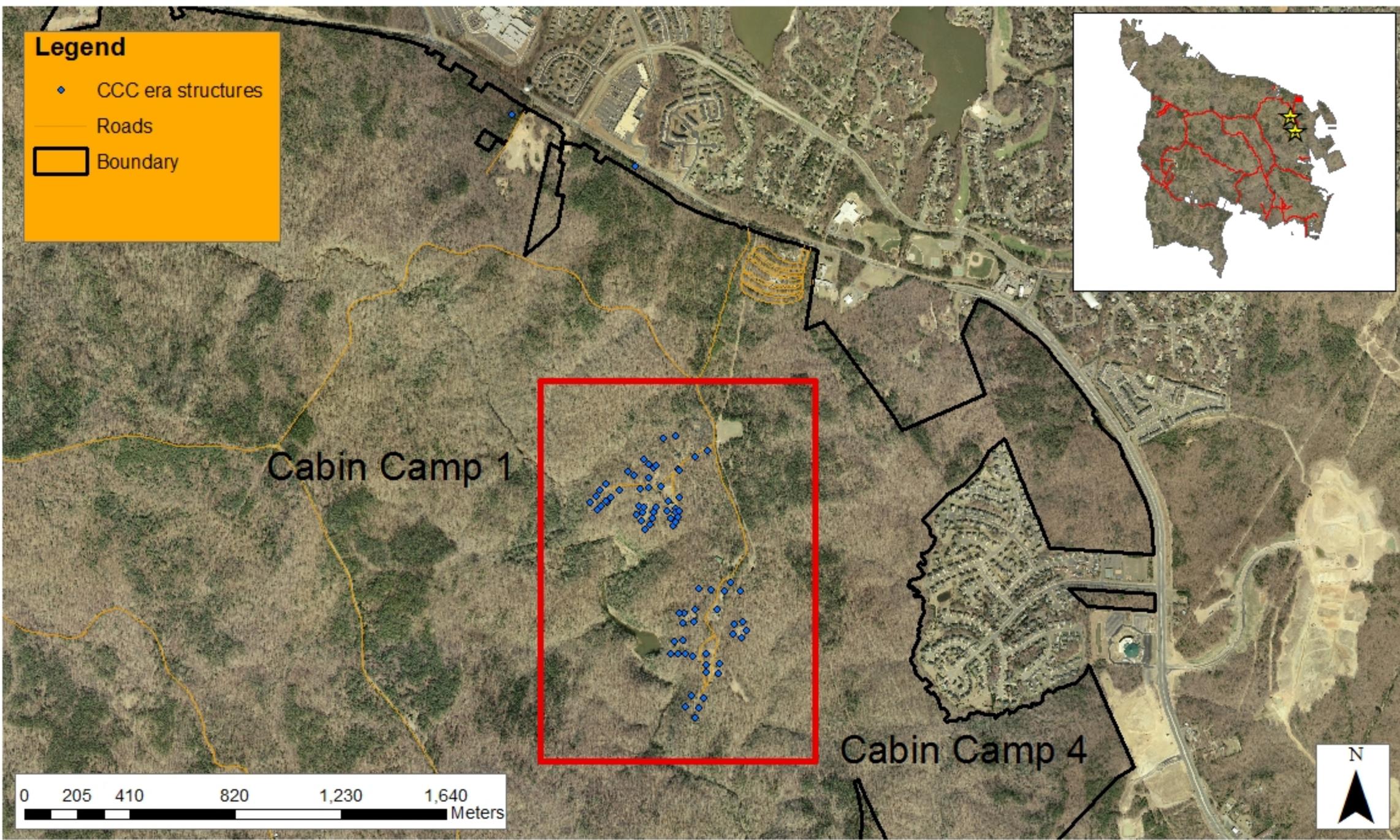
Enviroshake’s physical properties would not impair the structures or cause adverse effects. The shingles have the same weight as the previously used asphalt shingles and wood shake. In addition, the product has been improved with additives that bring UV stabilization, fungicide, insect, and mold resistance. Enviroshake does not absorb moisture in excess of 3% and does not encounter freeze-thaw issues that are associated with wood shakes. It can also withstand 110 mph winds. Thus, the physical properties of the Enviroshake product are better than the original roofing material.

In addition, the Enviroshake shingles are installed in the same manner as actual wood shake while following code for fasteners, flashings, underlay, and roof ventilation.

Roofing Material	Physical Appearance/ Historical Appropriateness	Maintenance	Lifecycle	Sustainability	Cost	Other
Cedar Shake	Use of cedar shake would be most historically appropriate	Requires yearly topical maintenance for mold, mildew, and fire prevention.	Life cycle is 20-30 years if maintained regularly	Made from virgin material	\$300 per square (estimate)	
“Warm Grey” Asphalt	Asphalt shingles do not match visible qualities of original cedar shake	Requires minimal cyclic maintenance	Life cycle is 20-30 years	Fiber glass mat base	\$90 per square	Class “A” fire resistant
DaVinci	Appropriate thickness and color; material is too heavily grooved to match texture of cedar shake	Maintenance free; installed in same manner as actual wood shakes	50 year warranty	Made from virgin materials, but is recyclable; cool roof	\$900 per square (estimate)	Class “A” or “C” fire rated; UV stabilizers
EcoStar	Brand does not have an appropriate color; Appears too flat; Folded ridge cap	Maintenance free; installed in same manner as actual wood shakes	50 year warranty	Made from 80% recycled materials	\$725 per square (60/40 mixture of thick and thin)	Class “A” and “C” fire rated; UV stabilizers
Enviroshake	Dark grey color turns to a silver; Thickness and variation also match original shake	Maintenance free; installed in same manner as actual wood shakes	Lifecycle is 50 years with a lifetime warranty	Made from 95% recycled materials	\$450 per square	Class “A” or “C” fire rated; Additives for UV, fungicide, insects, and mold resistance

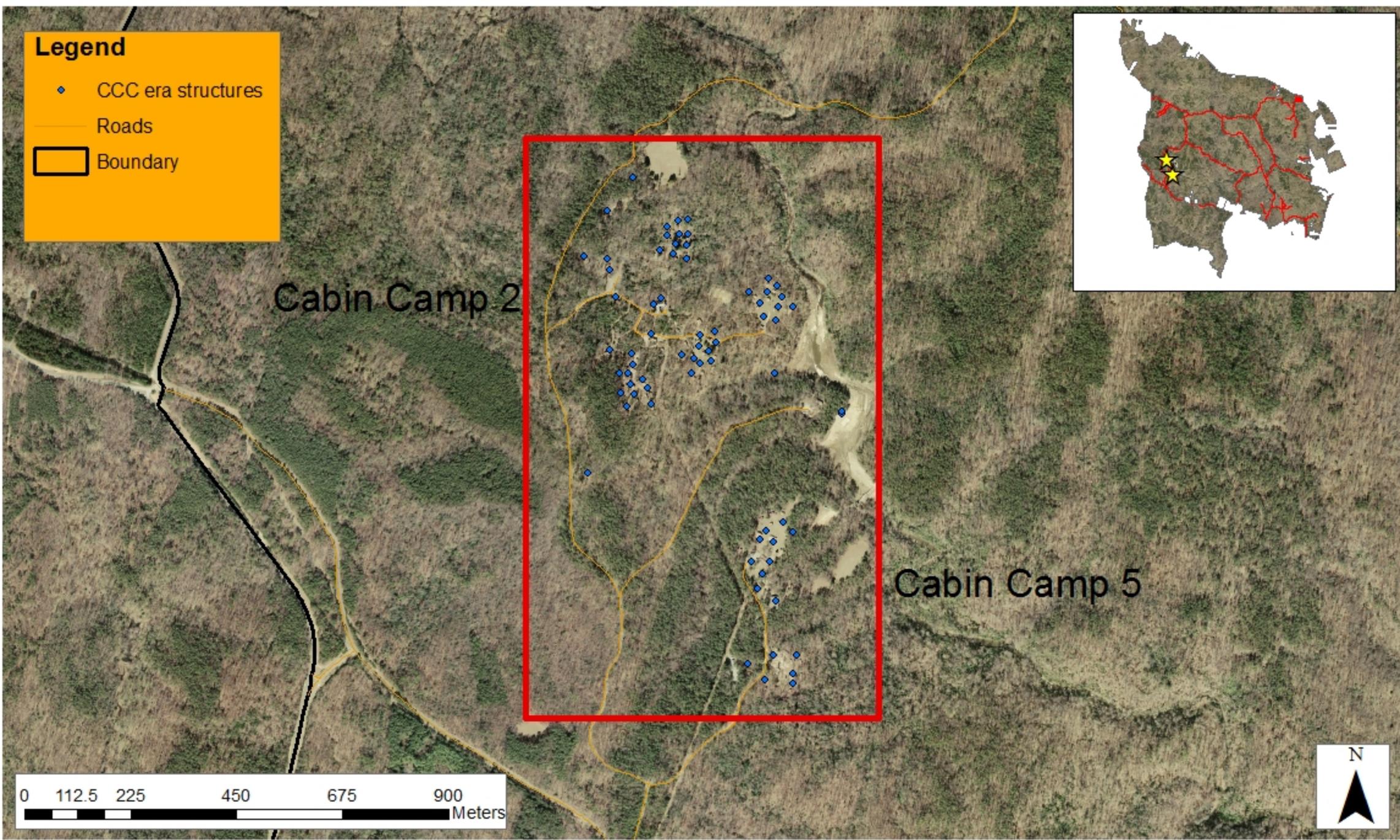


# Area of Potential Effect - Cabin Camps 1, 4





# Area of Potential Effect - Cabin Camp 2, 5





# Area of Potential Effect - Cabin Camp 3

