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Schulman Grove Day Use Site
Ancient Bristlecone Pine forest

Visitor Center Interpretive Plan

Ancient Bristlecone Pine

Prepared by the
Center for Design and Interpretation,
Rocky Mountain Region

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Schulman Grove Day Use Site and
Ancient Bristlecone Pine Forest

Visitor Center Interpretive Plan

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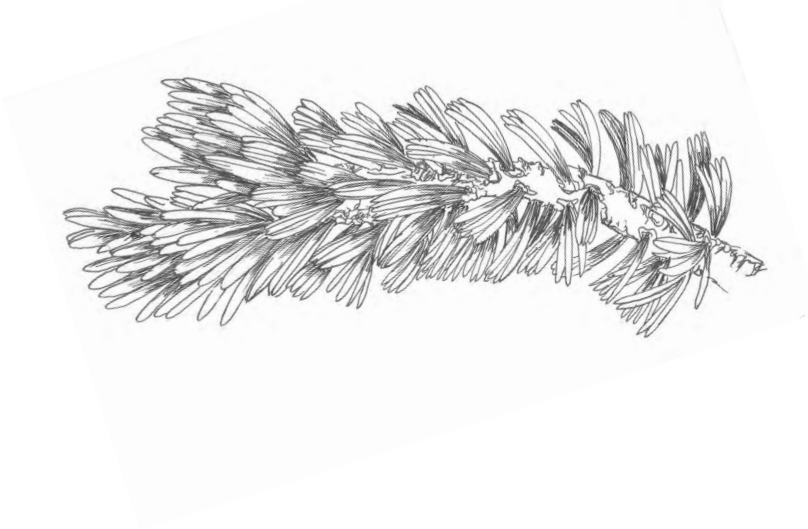

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Introduction

The Schulman Grove Interpretive Site is a day use facility located high atop the White Mountains of the Inyo National Forest. The interpretive materials, trails, visitor center and personal interpretive services all focus on the natural and cultural history of the oldest trees in the world: the Great Basin Bristlecone Pine *(Pinus longaeva)*.

The bristlecone pine is a conifer usually found at the highest elevations throughout the intermountain west. They are the oldest documented trees in the world with the champion being dated to 4,739 years old as of 2009. They are very photogenic in their mature state as they become twisted and gnarled, taking on an unusual appearance. Their long existence has made the bristlecone pines a favorite subject of dendrochonological and long-term climate study by academic and scientific institutions. The ancient bristlecone pine is a tree of international significance both from a scientific and cultural standpoint, have generated substantial public interest and curiosity. Coupled with a relatively easy drive to their location, the pine have seen increasing public visitation.

The Ancient Bristlecone Pine Forest was administratively designated as a Special Interest Area by the Secretary of Agriculture in 1958 in order to "protect the ancient trees and provide for scientific research and public enjoyment." In March 2009, the boundaries were slightly revised and the area became congressionally designated as the Ancient Bristlecone Pine Forest. It is not anticipated that management direction will change substantially as a result of that new congressional designation. Management is currently guided by its own prescription and area designation through the Inyo National Forest Land Management Plan.

The Inyo National Forest has chosen to provide the highest quality interpretive services and facilities to highlight the natural history of the ancient trees, the surrounding environment, and the role they play in scientific research.

Purpose and Need

This interpretive site plan was written in response to the September 4, 2008 fire which destroyed the existing Ancient Bristlecone Pine Visitor Center. The Inyo National Forest has secured funds to re-build the visitor center and surrounding interpretive structures that were lost in the fire.

The purpose of this plan is to identify the exterior interpretive signs that were unaffected by the fire and to include them into a comprehensive interpretive plan for the Schulman Grove Interpretive Day Use Site and the future visitor center. This plan will guide the design and fabrication of the visitor center exhibits and any other development of interpretive infrastructure. It will also ensure the dove-tailing of the visitor center exhibits with any exterior exhibits that need to be designed and fabricated

This interpretive plan is needed to ensure that the existing interpretive exhibits and stories merge seamlessly into the interpretive efforts of the new visitor center. It should also ensure that the overall interpretive effort at Schulman Grove is well-coordinated between the stories and exhibits that are currently in place, the future exhibits in the new facility, and the relationship between the exhibits that are inside the new facility and those that remain outside.

along with those exterior exhibits unaffected by the fire.

This interpretive plan will include the following:

- Overview of existing exhibits and interpretive programs
- Identification of main themes, sub-themes and stories to be interpreted at the Schulman Grove site

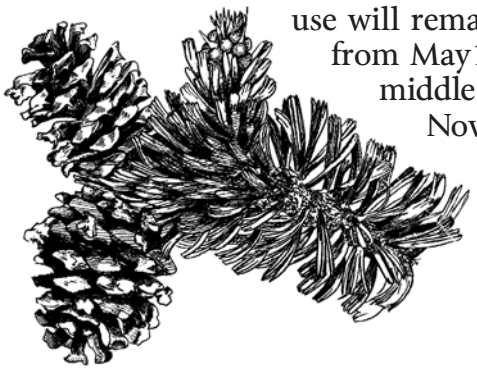
- Identify the function and role that the visitor center plays in the overall interpretive effort which will include the themes and stories that the visitor center interior and exterior will play
- Chart the development of additional resources needed for interpretation of a world-class resource
- Provide for direction of any needed demographic research and additional planning efforts

Planning Assumptions

General Interpretive Services

The primary reason visitors make the effort and drive to Schulman Grove is to see and learn about the ancient trees.

Due to its location at 10,000 feet in elevation high atop the White Mountains, the Schulman Grove Interpretive Site will remain a spring, summer, and fall attraction with very limited winter visitation. The season of use will remain primarily from May1 through the middle to end of November.



Since overnight facilities will not be provided beyond the one established campground-and the fact that it takes 45 minutes to drive to Schulman Grove from the Owens Valley-it is anticipated that the area will remain as a single day visit location. Visitors that return to the area for a second or third day during their time in the eastern Sierra are very few.

Most visitors allot enough time for a reasonably thorough stay.

Food and water (except bottled water) will not be available at the site.

Due to the scientific nature of the resource, guests that come to the site will continue to have a higher education and income level than many other visitors to other regional park and forest lands.

All newly constructed facilities and exhibits will be ADA compliant and where appropriate, strive for LEED certification.

Prior to arriving, most visitors know that these are the oldest trees in the world but have little understanding of the concepts of:

- dendrochronology (tree-ring dating)
- the history changing impacts of these trees (revision of the cultural diffusion theory as a result of radio carbon recalibration)
- the widespread and common occurrence of Great Basin Bristlecone Pine
- the natural history of the ancient trees – why they grow where they do and how they have gotten to be so old
- the impacts of global warming on the bristlecone pines and the role the bristlecone pines play in worldwide climate change research

Description of Resource

The Ancient Bristlecone Pine Forest is home to the oldest trees in the world, the Great Basin Bristlecone Pines (Pinus longaeva). Some of these trees have lived over 4,500 years and are still alive, growing and reproducing. While these trees grow in the six western states of California, Nevada, Utah, Arizona, New Mexico and Colorado, nowhere are they as old as in the White Mountains of California.

The bristlecone forest extends the entire length of both the White Mountains and the Inyo Mountains to the south. The forest is not a continuous, thickly canopied forest as one might envision in the Sierra or Rocky Mountains, but rather a series of open forested pockets of trees ranging from groves of a few acres to thousand-acre stands. The trees are very sensitive to their growing conditions and are often out-competed on soils offering more favorable conditions or on slopes that provide higher levels of moisture (thus providing more competitive conditions).

The bristlecone pines are highly significant from both a cultural and scientific standpoint. They are beautiful old trees that have a very high intrinsic and in some cases spiritual value to the thousands of visitors who come to see the ancient forest each year. The tree-ring record that each tree leaves has proven to be an invaluable resource for scientists studying past weather and climate conditions.

The ring patterns produced by bristlecone pines are unique as they more faithfully record the annual precipitation pattern than any other tree. Because the bristlecone pines live so long and are excellent recorders of precipitation patterns, they have become the most significant indicator of past climates. Not only do the living ring patterns reach back nearly 5,000 years, but by overlapping or cross-dating the dead wood, ring patterns scientists can peer back into past climates nearly 12,000 years ago. Because of this, the bristlecone forest is used each year for various research projects involving both the old trees and other issue of high altitude research.

Current research includes tree-line advance due to climate change, disease and pest infestation, extension of the continuous tree-ring chronology, and similar issues. While research involving US Forest Service personnel is conducted through the USFS Pacific Southwest Research Station, local personnel from the Forest Service play an important coordination and logistic role for the researchers. In addition to providing housing, water, a field lab and other logistical support, the Forest Service visitor center in the bristlecone pines provides a location for researches to stage and coordinate their field work. It also provides an important link for permit issuance and day-to-day researcher coordination.

Administrative & Research History

Interest in the bristlecone pine forest began in the early 1950s with the arrival of research personnel from the University of Arizona, Laboratory of Tree-Ring Research. Dr. Edmund Schulman had been searching for old trees in Idaho for a research project on climate patterns when he was alerted to the possibility of very old trees in the White Mountains. Until that point, the White Mountains had been a little

explored, somewhat forgotten corner of the Inyo National Forest, used mainly for mining, grazing, and hunting in the fall. Schulman eventually journeyed into White Mountains in the fall of 1953 exploring the bristlecone forest. He returned to the University of Arizona with increment bore samples of trees that sparked his interest.

It wasn't until later in the winter of 1954 that Schulman analyzed his increment bore samples and realized that he had taken some very old samples. He had discovered the worlds first known 3,000 year-old tree AND the world's first known 4,000 year-old tree. Schulman went on to date several dozen trees that exceeded 4,000 years of age, eventually discovering the world's oldest known living tree which he named Methuselah. Since Schulman, there has been a nearly non-stop procession of researchers from many academic and scientific institutions.

Schulman's discovery of the old trees brought additional tree-ring research into the bristlecone forest and eventually a tree-ring record was established using the tree-ring records of living trees overlapped or "linked in" to the patterns of dead wood, which is quite well preserved in the dry, cold environment of the While Mountains. This continuous tree-ring chronology is the longest in the world and provides an incredible resource for academics and researchers alike.

In 1958 Edmund Schulman published his amazing discovery of the age of the bristlecone pines in a landmark National Geographic article. Shortly thereafter, interest in both research and visitation began to increase. This encouraged the Forest Service to administratively designate the area as a Special Interest Area in 1958. With this designation came a separate set of rules and regulations pertaining to the 28,000-acre botanical area. Those rules and regulations were updated in 1996 and are still in place today. The management of the area is guided by the Inyo National Forest Land Management Plan which provides a separate prescription for the area.

Edmund Schulman passed away at the early age of 49 but his work was continued by his assistant, Dr. Wesley Ferguson. Dr. Ferguson turned his attention to the dead wood in the forest; both the standing dead trees (known as snags) and the dead wood on the ground. He soon discovered that the dead wood produced clear tree ring patters that could be cross dated with the established chronology. In this manner he extended the chronology back thousands of years. Unfortunately, Dr. Ferguson lost his battle with cancer and also passed away at a too-young age.

Other researchers have prowled the bristlecone forest in search of its answers to the question of longevity. Dr. Henry Michaels of the University of Pennsylvania collected what is the oldest piece of wood found to date and has worked on his own chronology. Various researchers have used the tree-ring records of the bristlecone pine for research involving climate warming/cooling, global volcanic events and other research subjects

Current research efforts are directed towards closing the chronology "gap", providing data on seedling propagation, season of growth variances and White Pine Blister Rust resistance.
The continuous tree-ring chronology currently stands at about 8700 years in length. This continuous tree-ring chronology combines the tree-ring

records from living trees and the cross-dated patterns of wood found on the forest floor. A second chronology exists that extends back to the year AD 9000 which includes 11,000 year old wood. Most scientists believe that the gap or section of "missing" rings between the two chronologies may only be a few hundred years in length. Once that missing piece is found that will link in both chronologies, dendrochronologists will have assembled a continuous tree-ring chronology from the bristlecones in the White Mountains back to the period of time that California was emerging from the last ice age.

Legislation signed by President Obama on March 30th, 2009 provided for a minor boundary revision and legislative designation of the Ancient Bristlecone Pine Forest.

Previous Facility

From the time of administrative designation until the early 1970s there was intermittent Forest Service presence at Schulman Grove during the summer, but no facilities. Sometime in the early 1970s small mobile home/office style trailer was moved onto the site and served as visitor center until the log facility was built in 1995.

The visitor center that was destroyed by fire in September 2008 was constructed over a three year period of 1994–1996, opening on July 1 of that year. A small 400 ft^2 theatre room was added in 2002 bringing the total square footage up to 1600 ft^2.

The facility that was destroyed had three main rooms: an office/storage area, a small 20 seat theatre room, and a main auditorium/exhibit room. The surrounding grounds also included an exterior exhibit area (destroyed by fire) and adjacent patio space (unaffected by the fire). The building housed a bookstore run by the Eastern Sierra Interpretive Association, an art gallery area, a small sitting area, a free standing front desk/counter area (room for 2 personnel), a discovery table, and exhibits along the wall. The bulk of the square footage in the main auditorium area was used for visitor traffic, small stand-up group presentations, and space for up to 40 visitors to get inside out of the elements. The building worked extremely well as a focal point for shelter, interpretation, and employee administrative functions.

The design of the facility and its ability to fit into the environment was a key to the success and overwhelming positive public reaction to the facility. The tone and ambiance of the interior was not one of a provocative discovery center but rather one of beauty with a serene presentation of the natural and scientific history of the ancient trees.

Notes

Audience Analysis

Visitation to the Ancient Bristlecone area is strictly on a day use basis; overnight camping is not allowed within the established forest. A small percentage of visitors may camp at a campground five miles away but the vast majority drives up to visit the old trees from the Owens Valley as a day trip. The typical group arrives with an average of three persons per vehicle, spends about 2 ½ hours on their visit and accomplishes at least one of the hikes, usually the 1-mile Discovery Trail (unpublished date collected by Humboldt State University July, 2004). These visitors often bring their own lunch and water, and are usually prepared for the day trip at the 10,000 foot Schulman Grove area.

The season of visitation begins when the winter closure gate is open – usually the week prior to the Memorial Day weekend. The ending of the visitation is dictated by the arrival of winter weather. The closure date is more variable than the open date, but the first snows that close the road typically arrive around Thanksgiving. Winter visitors are welcome to snowshoe, ski or hike through the snow to the Schulman Grove area.

July and August are the busiest months followed closely by June and September. Visitation in May is not much although the weekends from the middle of the month on are getting busier. The "summer season" ends at the fourth week in August but the fall/late summer visitation through the end of September is strong. As an example, in 2006, the visitation for September actually exceeded that of August.

Saturday is by far the most visited day. The Saturdays in July and August tend to be quite busy – the parking lot is usually 2/3 full during that time with an average of 15 to 20 people in the building at any one time. Weekdays during the core summer months can be busy, typically in the late morning and early afternoon. On most days, the mid-late afternoon sees a lull in visitation with a pick-up in numbers between 4:00 and the usual closing time of 5:00.

Families with school age children are common during these summer months with a noticeable change to younger retired and/or traveling-adventuring seniors during September and October. The largest percentage of visitors is from Southern California visiting the eastern Sierra on a very long weekend or a week-long visit. People frequently visit the bristlecone pines as part of their visit to Mono Lake, Devils Postpile, and Death Valley (off season). Foreign visitors make up approximately 8 to 10% of the visitation during the height of the summer season and a slightly lower percentage in the fall. Of these foreign visitors however, the great majority speak English quite well and the need for translated interpretive materials has historically been low.

One of the functions of the visitor center was to be a place to rest and/or wait for companions in a comfortable and convenient place.

Visitor Use Trends

Visitation to the ancient bristlecone pine forest jumped significantly after the visitor center was opened in 1996. This was in part due to the publicity of the new facility and numerous magazine articles. The visitation that year exceeded 30,000 visitors. It should be noted that this figure represents visitors to Schulman Grove and not necessarily the visitor center. The visitor

count includes visitors after hours and during the seasonal time periods that the visitor center is not staffed. Since 1995 there have been ups and downs but generally speaking, the visitation has increased about 5% per year. The most notable increase has been in September, while use trends have indicated a slight decline in use during the last week in August. This may be attributed to schools starting earlier in August. In the last 10 years, the use in May has also increased due to earlier opening of the road as a result of decreased snow packs.

The former building had approximately 600 ft^2 of space dedicated to pedestrian traffic, exhibit viewing and interacting with the ranger staff at the front desk. This space was adequate for the current level of visitation except during times when school groups visited. These groups typically numbered about 40, and combined with general visitors to the area, strained the available space. The other instance when the 600 ft^2 was inadequate was during times of thunderstorms or other weather events that would "chase" the outside visitors into the building for refuge.

While the ancient trees are the feature that attracts visitors to the area, the visitor center building became a very close second to that main focal point. It is the mission of the visitor center staff to turn that attention back to learning about the ancient trees and to have the visit become a learning/interpretive experience that centers on the trees. The facility should be secondary to that objective but should provide a beautifully designed complement to the mission of increasing the visitors understanding of the ancient trees and the role they play in interpreting our past and perhaps predicting the future.

Existing Interpretive Opportunities

The staffing of the Schulman Grove Interpretive Day Use Site mimics visitor use patterns. After the road opens in May, ranger presence is limited to occasional visits during the week and drive-through checks on the weekends. Staffing of the visitor center usually begins on weekends on or about the third weekend in May and increases in frequency until 7 day/week operation begins on or about the second week in June. Staffing is daily through September, usually from 10:00 in the morning until 5:00 in the evening. There is no overnight or late evening presence at the site.

One principle of the interpretive effort at Schulman Grove is that the "bristlecone story" be presented outside so that visitors have a satisfying visit whether the area is staffed or not. The patio exhibits, Discovery Trail panels, and Methuselah Trail brochure all contribute to this effort.

Interpretive programming and development at Schulman Grove has been based on several of the following foundations:

- Visitors frequent the area in the evenings and during the seasonal period when staff is not on duty.
- Guests arrive at the area with one main objective: to view the ancient bristlecone pines. A secondary objective is to acquire information to answer the question of how the trees attain such an incredible age.
- The education and income level of visitors is higher than many other local or regional destinations.
- Interest levels in seeing the old trees and learning about them is high as the trip to the grove requires a commitment of time. The bristlecone forest and specifically Schulman Grove is a destination that many visitors have had on their "list" for years.

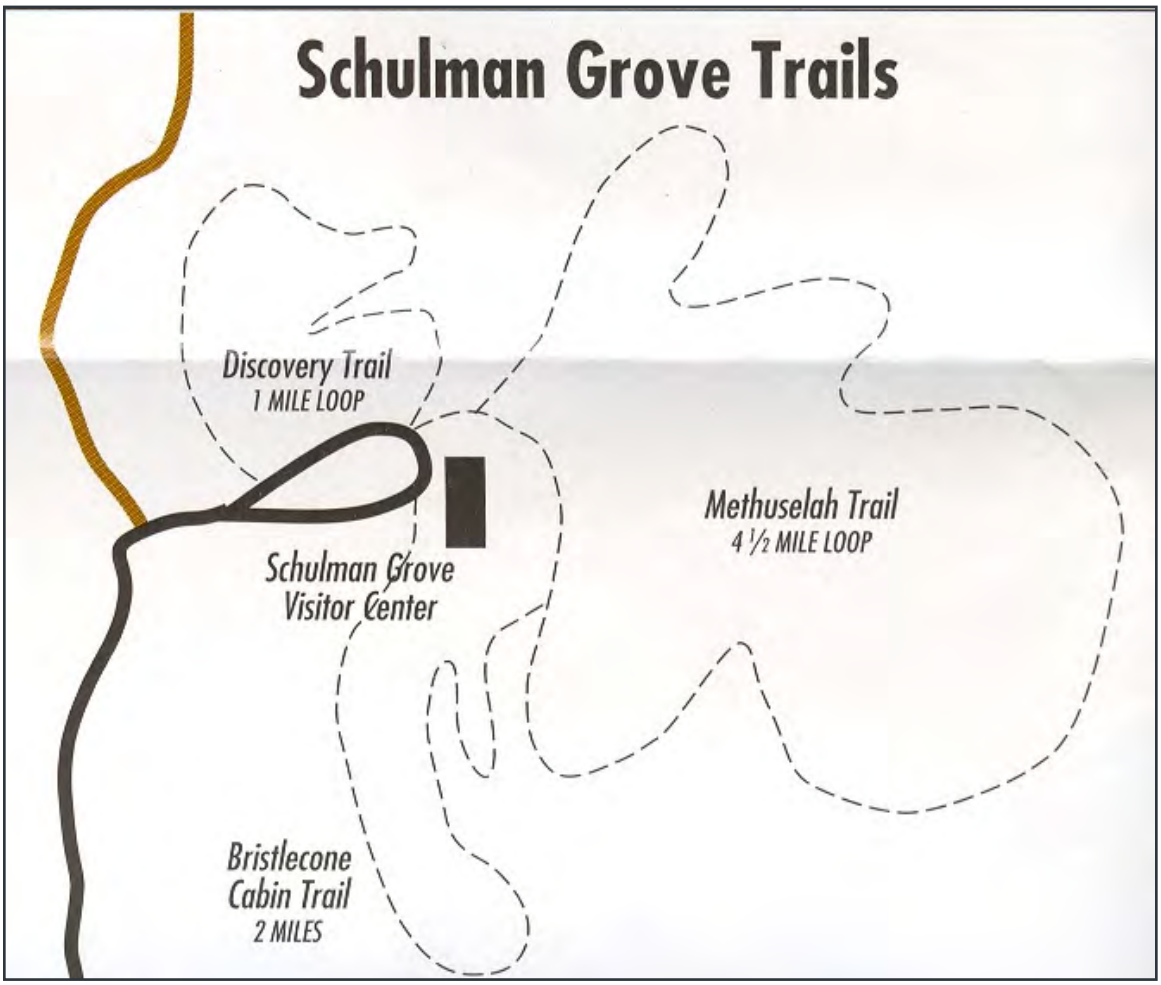
Clark's Nutcracker

While the ancient trees are the feature that attracts visitors to the area, the visitor center is the second focal point. The facility objective is to be a beautifully designed center that complements the mission of increasing the visitors' understanding of the ancient trees and the role they play in interpreting our past and perhaps predicting the future.

Interpretive efforts have centered on achieving **two main goals:**

1. Having visitors understand the principles of tree-ring dating (dendrochronology).
2. Leaving with a basic understanding of how these trees have changed the interpretation of western European history (through radio carbon dating).

Current interpretation consists of 1) interpretive trails through the grove; 2) free printed material specific to the area; 3) exterior exhibit panels along the patio perimeter; 4) a visitor center with exhibits; 5) an introductory film; and 6) personally delivered information, talks and guided trail hikes.



Interpretive Trails

There are three trails radiating out from the main visitor center area of Schulman Grove. The Discovery Trail is a heavily used, 1 mile interpretive trail with trailside exhibits. The panels tell the story of Dr. Schulman's discovery of the old trees and some of the natural history features that are easily seen along the trail. (See Appendix A for a listing of trail exhibit stories.)

This loop trail winds it way up a hillside then through one of the ancient groves where Dr. Schulman first discovered the remarkable age of the trees. The trail has benches along the way and is the "flagship" trail for visitors to the area. It takes about 45 minutes to complete and provides close-up viewing for trees that exceed 4,000 years of age. Staff encourages all visitors that appear physically able to hike that trail. The parking lot and visitor center are surrounded

Interpretive panels along the Discovery Trail

by bristlecone pines, but they are not the old ancient trees that visitors have come to see; the Discovery Trail provides the closest view of those trees. The Methuselah Trail is a 4.5 mile loop trail leaving and returning from the visitor center patio. It loses then regains 800 feet in elevation and is rated as moderately strenuous. It takes approximated 2 to 3 hours to complete and provides beautiful views of adjacent valleys and ranges. Like the Discovery Trail, it winds its way through an ancient grove of bristlecones and passes near the Methuselah Tree, the oldest known tree in the world (not identified along the trail). The hike passes through various vegetation zones and provides a much longer hiking experience through a wider variety of vegetation types, slopes and soil types.

The Methuselah Trail has a number post and trail brochure that describes many of the features of the flora and fauna along the trail.
The third interpretive trail at Schulman Grove is a short ¼ mile hike to an old mine site, the Mexican Mine. The "Bristlecone Cabin Trail" passes several intact cabins, all made of bristlecone logs. The trail then continues to an upper mine site and over a ridge to connect with the Methuselah Trail. From that trail junction hikers are able to turn to the left to return ½ mile to the visitor center, or turn right to continue on the length of the Methuselah Trail also ending up back at the visitor center. There are not any of the old, ancient bristlecone pine trees along this Bristlecone Cabin Trail but the mine site includes an interpretive exhibit at the old cabin.

For visitors with a limited time to spend in the forest, staff suggests they hike the Discovery Trail in order to get a close up view of the twisted,

Methusala Trailhead from the lower patio

gnarled old trees. Those that are not experiencing any "altitude issues" and are in at least moderate physical shape, the Methuselah Trail remains a popular option, especially if they are making a day of their visit to the ancient bristlecone pine forest.

Recommendations:
1) Add two panels to the Discovery Trail to provide for a more continuous "read" throughout the entire trail. The subjects that are not included in the current interpretation include the soil loss/exposed root story and the story of die-back and regrowth. Both of those concepts are very well displayed in locations that will even out the panel distribution and make for a more continuous interpretive story. Continued emphasis should also be given to replacement panels as the current ones become worn or outdated.

2) The Methuselah Trail numbered trail post and brochure is very outdated and needs to be re-done in a more thematic manner. The project would be excellent for a senior project or part of a graduate program by a student of the interpretive arts. It is recommended that an intern be hired for the 2010 season to carry out this project from start to finish. Funding and housing are available for this project.

3) A new exhibit was placed at the Mexican Mine in the spring of 2009 but an additional exhibit panel at the upper mine site would enhance visitors experiences and would be able to complete the mining history.

Printed Material

Several free printed handouts are available for visitors or those phoning prior to their visit. The site brochure is a typical full color brochure including natural history information, a map of the bristlecone forest, suggested activities, hiking trails, rules and regulations, and additional information resources. It provides a resource for visitors at the site and a reference to be read back home.

Single sheet information handouts are also available for free distribution. These include:

- A re-print of the landmark 1958 National Geographic article on the "discovery" of the ancient trees, written by Edmund Schulman
- A Family of Trees – a written and graphic presentation of the history of the foxtail pine family of trees (of which the bristlecones are included)
- Rings of Time – A discussion of the principle of dendrochronology and cross-dating
- Plant List for Schulman Grove
- Bird List for the White Mountains
- Geology of the White Mountains (new for 2009)
- Pioneers of Dendrochronology

In addition to the free informational handouts, the interpretive association bookstore also sells several books pertaining to the natural and cultural history of the ancient trees.

Recommendations:
While the content of the informational handouts is high quality, the graphic design and "look" of the material is dated. The handouts should be redesigned with a common family look. The cost of these informational handouts is currently borne by the interpretive association which should be continued.

A subject that is needed in the informational handout list is a well written history of radiocarbon dating and the role that the ancient trees have played in the recalibration of that process. The complexity of subject matter requires this be written by a subject matter specialist.

Emphasis should also be placed on guiding visitors away from paper copies of the information and towards accessing them on the internet. All informational handouts should be made accessible through the natural history section of the bristlecone pine web page on both the Forest Service and interpretive association websites.

Exterior Exhibit Panels

Exhibits remaining on the wooden deck from the former facility are etched aluminum panels that discuss various natural history subjects such as competition, identification of the two conifers at Schulman Grove (limber pine and bristlecone pine), soil conditions, and similar topics. The panels are located along the lower patio area of the visitor center proper and contribute to the after hours visitation, and interpretation of the natural history of the ancient trees. (See Appendix B for listing of patio exhibit stories)

Existing exterior exhibits

Recommendations:
The exhibits are frequently read because of their close proximity to picnic tables. (They will also be located next to the new visitor center.) These panels are still in good condition, but a schedule for panel replacement with an estimated budget will be developed by the visitor center manager.

Staffed Interpretive Services

Rangers are on duty 7 days/week during the summer with variable staffing during the shoulder season. While interpretive programs are conducted daily, a robust schedule is difficult to accomplish due to the random arrival times of visitors. Past trends have shown that it is more productive to have a well prepared staff to present on-the-spot programs when larger numbers of visitors are present.

Introductory Film

The previous visitor center and the plans for the new one include a small theatre in order to show the documentary 18-minute film: "Living History – The Bristlecone Pines." The intent of the film documentary is to provide the most accurate introduction to the natural history of the ancient bristlecone pines and to provide a vicarious visit to the ancient trees for those that are mobility challenged or find hiking difficult at the 10,000 foot elevation. It was never intended as a substitute for a hike or actual visit to the ancient trees but to introduce and and hopefully induce a hike to see the ancients.

The film also presents subjects that are more difficult to show or discuss in person such as microscope views, images of bristlecones in other areas, enlarged maps, and interviews with researchers.

During the core summer months it is shown virtually around the clock on weekends and 8 to 10 times per day during the weekdays. It is anticipated to continue that use in the new facility.

Recommendations:
The documentary film remains an important component of the overall interpretive effort at Schulman Grove. The film needs a slight revision to include images of the Arizona grove, a short inclusion of Dr. Henry Michaels contribution to the research and other very minor revisions. A long range recommendation would include remaking the documentary in widescreen high definition.

Visitor Center

The visitor center is the focal point of the interpretive effort at Schulman Grove. It provides staffed interpreters, exhibits on cultural and natural history topics, artwork and other media that is difficult present in outside exhibits. While the visitor center was never designed to house "discovery center" type exhibits, it provided a location to present stories and interactive exhibits that were difficult to present outside.

The visitor center that will replace the structure destroyed in the 2008 fire will be similar in function. It will be about 25% larger with additional space in the exhibit hall and theatre room. The new exhibits will focus on subjects that support the main natural history of the bristlecone pine story.

Interpretive Statements

Goals and Objectives for Interpretation

Goals #1: Provide quality personal interpretive services.

- Objective: Each visitor should have the opportunity to ask questions and engage personnel in discussions about the natural history of the ancient trees and their surroundings.

- Objective: Adequate training time should be built into pre-season operations in addition to periodic training throughout the summer. Employees should be given time to read historic and current research articles in addition to standard training and reference materials. Conduct frequent discussions with employees on subjects about the natural history of the ancient bristlecone pines.

Goal #2: Printed information is well-designed and up-to-date.

- Objective: On a yearly basis, all publications should be reviewed and updated as needed. Hand-out material should be professionally designed for maximum effectiveness and visual appeal.

- Objective: All printed handout should be re-designed into a family design and publishing and printing should be taken over by the interpretive association.

Goal #3: Static displays, exhibits and trail panels are designed, fabricated and maintained to the highest standard.

- Objective: All exhibits and displays will be professionally designed, be part of a planned integrated theme and be replaced and maintained whenever needed.

- Objective: All exhibits should be replaced or maintained when needed. This will ensure a well-maintained site.

Goal #4: Information and interpretive services are provided in such a manner that visitors leaving the site will have a broad overview of the natural history of the ancient bristlecone pines and a basic understanding of the principles of dendrochronology.

- Objective: Upon leaving the site visitors will be able to recall the distribution of the bristlecone pines, the basics of why they attain such a great age, and how to determine the age of a tree (increment boring). Visitors should also have the basic concept of a continuous tree-ring chronology and how that relates to past climates. Visitors will be introduced to the concept of the bristlecone pines as great recorders of past climatic changes.

Goal #5: All exhibits, information and personal interpretive contacts will encourage and motivate visitors to explore the forest and become stewards of public lands, and to the extent possible, use the trail system to visit the ancient trees.

- Objective: Each visitor should be provided the information that indicates that while all the trees in the vicinity of the visitor center are indeed bristlecone pines, it is only by hiking the trails that they will be able to view the ancient trees.

Visitors should be encouraged to hike at least the short Discovery Trail, while informing them of rest benches, the distance and difficulty of the trail, and the option of viewing the documentary film as an alternative to those that might be unable to hike the trail.

Goal #6: Exhibits will present the following subjects in a manner that is visually pleasing, easily-understood, and designed to the highest standards:

- Objective: To provide a basic biological and historic background of the bristlecone pine and its White Mountain environment including past native inhabitants.

- Objective: To foster a greater understanding of our role in managing forest health, and water production as it pertains to management, scientific and research efforts with the historically long tree ring chronologies as indicators of past climates.

- Objective: To provide a basic understand of the principles of dendrochronology, dendroclimatology, and fundamental understanding of the principles of radiocarbon dating and its impact as it relates to the bristlecone pines at Schulman Grove and the reinterpretation of the west European history.

Themes, Sub-themes and Critical Stories

Visitors' primary objectives are to see the old trees and learn about the conditions and circumstances that have allowed these trees to become so old. To this end, the interpretive effort and specifically the exhibits will be designed to accomplish both management goals and to provide the information and interpretation that the visiting public is seeking.

Themes, sub-themes, and stories have been developed to facilitate that dual need and are predicated on both the planning assumptions as outlined earlier and the following:

- The main "bristlecone story" of the natural history of the trees will be presented outdoors in order to facilitate the interpretive effort during non-staffed times such as before and after seasonal staffing and before and after hours during the summer.

- Exhibits and all interpretive efforts will be directed to personal exploration of the groves with an inspired interpretive background provided by staffed interaction, exhibits and/or printed material. For those unable to hike to the ancient trees, a satisfying and rich interpretive experience will be gained through the film documentary, exhibits, and staff interaction.

- All exhibits for the new visitor center and its immediate surroundings will be planned in concert with those that remain at the site and were unaffected by the fire.

The overarching theme of the interpretive effort reflects the two elements that have been identified as critically important in bristlecone pine interpretation: time and recorders of change. This primary interpretive theme is:

> The Bristlecone Pine Forest is a living record of our changing earth.

The exhibits that are planned will reflect this overall theme as the story of the trees and their natural and human surrounding of the White Mountains are explored. Four sub-themes will complement this overarching exhibit theme:

1. Ecological Adaptations
2. Geology
3. Stewardship and Management
4. A Sense of Time

Ecological Adaptation Sub-theme: Life at this harsh, high altitude environment requires adaptations to survive. (Broad display of flora/fauna and adaptations; why they live here.)

Critical Stories: The core story of the natural history of the ancient bristlecone pine; a basic natural history overview (exterior kiosk treatment)

- The natural history of bristlecone:
- Dense wood and thick resin contribute to the trees' resistance to invasion by insects, fungi, and other potential pests.
- Bristlecone pines can survive on the dolomite and alkaline layers of their habitat. Few competitive species can survive in this type of soil.
- Bristlecone pines grow in isolated groves at and just below tree line.
- Because of cold temperatures, dry soils, high winds, and short growing seasons, the trees grow very slowly.
- The bristlecone has adjusted to places on earth that no other tree wants to inhabit, and in these harsh environments, has flourished free of competition.
- As a tree ages, much of its vascular cambium layer may die. In very old specimens, often only a narrow strip of living tissue connects the roots to a handful of live branches

See http://www.sonic.net/bristlecone/growth.html for more information.

Ecologic irony:
- These trees survive harsh conditions, developing strength through adversity.
- The bristlecone's longevity creates unique habitat conditions that allow other unique plant and animal life to flourish; bobcats, bighorn, astragulus, and other rare and diminutive plants survive in these conditions beside the bristlecone pines.

The White Mountains are an example of an island in a desert:
- The White Mountains are a tiny fragment of vegetation and plant life surrounded by the massive Great Basin environment with variation and contrast based on elevation.
- The geologic make-up of the White Mountains is of quartz sandstone and granite bedrock.
- Extensive outcrops of dolomite with numerous fossils can be found here. The dolomite is low in nutrients but of a higher moisture content than the surrounding sandstone.
- Because these soil types inhibit the growth of other plants, they provide a competition-free arena for the slow-growing bristlecone pines.
- Before the early 1900s, this valley region was home to the Paiute and Shoshoni people, nomadic desert people who were hunters and harvesters.
- Jedediah Smith, and other mountain

men discovered the area in 1827 and white settlers soon followed, moving up into the mountain areas, establishing mining camps, and pastures for their livestock. Some cabin remains are still visible along the road today.

Geology Sub-theme: The geological formation of the White Mountains resulted in soils conducive to bristlecone pine survival and advancement.

Critical Stories: Sediment ocean body uplift created dolomite soils that bristlecone have adapted to where other species have not. (Discovery table and wall exhibit)

- The geological formation of the White Mountains resulted in soils conducive to bristlecone pine survival and advancement.
- The fossils in the dolomite soils are part of the geologic phenomena of the White Mountains and the ancient sea that once flowed in this region.

Stewardship and Management Sub-theme: Stewardship of the landscape is consistent with the desire to preserve these ancient trees for public appreciation and scientific research. (Wall exhibit panel)

Critical stories:

- 21st century Forest Service management has guided the construction of a model, sustainable building, quality special area management, and close attention to public needs and desires for the Ancient Bristlecone Pine Forest.
- The original visitor center was destroyed by a fire in 2008 and rebuilt in 2010 due to community support committed from the public and private sectors and using design principles for sustainability and energy efficiency.
- A history of scientific research in the White Mountains and Schulman Grove has provided an irreplaceable picture into the earth's past environments.
- These gnarled and twisted trees with their ancient lifespan captivate our imagination and inspiration for various artistic expressions.
- The Ancient Bristlecone Pine Forest was administratively designated as a Special Interest Area by the Secretary of Agriculture in 1958 in order to "protect the ancient trees and provide for scientific research and public enjoyment."

A Sense of Time Subtheme: Time as measured through these ancient trees has given us a more accurate understanding of our place in history. (Exhibit panels along cross-dated slab section and three part wall exhibit)

Critical stories: Bristlecone pines have measured time and environmental history through their incredibly long and continuous tree-ring chronology.

- Carbon 14 dating cross dating and recalibration illustrates the recalibration story of these trees that changed the interpretation of western European history and changing the interpretation of the sequence of events in history.
- The records of human use on this landscape indicate post modern and prehistoric human activity within the White Mt. Range.
- Schulman Grove has seen a long history of research beginning with Edmond Schulman (Pioneer of Dendronchrohology).
- Time has been measured in various methods dating back to Native American habitation of White Mountains.
- Trees serve as living recorders of past climates with bristlecone tree ring records dating back 11,000 years.
- The records from the bristlecone pine rings identify the dynamic changes in our environment in the here and now. (map showing range of species migration and movements to illustrate)
- The bristlecone tell a story of climate change on earth (changes in treeline) and what it implies for ecosystems and species evolution.
- Because earth temperatures are getting warmer, a more inhospitable environment is created, the trees in bristlecone pine forest are at risk as they are more vulnerable to disease and insects.

Notes

Ancient Bristlecone Pine Forest Visitor Center

Visitor Center Functional Goals

The overall purpose for a new visitor center at Schulman Grove-while similar to those of the previous structure-also includes an updated interpretive focus on scientific research and climate change impacts, along with an enlarged theatre room. The following are functional goals for the facility to achieve that overall purpose.

Goal 1: Provide a focal point for interpretation.

Provide interpretation in a manner that is consistent with the beauty and peaceful tone of the surrounding area. The building should allow for visitors to read and interact with exhibits, view the film documentary, interact with staff, and have the opportunity to learn and understand about not only the natural and cultural history of the trees but also the current research and on-going scientific studies.

- Objective: Visitors should leave the area having received the opportunity to understand the basics of dendrochronology and the relationship of the ancient trees to climate change and other on-going research.

Goal 2: Provide administrative space for staff work areas, book storage, an employee break/lunch room, and an office research library, specifically:

1. A room for storage of books, bottled water and other association sale items. Included in this area should be space for a work table and a small lunch room table.
2. A separate office with room for bookshelves, filing cabinet and work table, so that the facility may serve as a location for any research personnel to work on field notes and use the reference library.

- Objective: Employees should be able to work in areas that provide enough storage so that it is uncluttered and clean. Enough space should be allocated so that materials may be unboxed and put away, books may be priced, and projects accomplished on a work table no less than 6 feet long.

> The overarching goal of the Bristlecone Pine Forest Visitor Center is to provide a focal point for the interpretation of the natural history of the world's oldest trees at a facility that blends into and complements the adjacent scenery.

- Objective: The office/research library should be large enough to fit 3-4 people around a table. The room should have enough wall space to allow for a large bookshelf and filing cabinets in order to store research papers.

- Objective: The two rooms should be joined and located so that an employee can work in either room "in the back" during slower visitation times and be no more than 20 to 25 feet from the front desk counter in order to serve visitors.

Goal 3: Provide space for a small natural history association bookstore.

In such a remote area there is a need for an association to provide sale items

that increase the understanding of the visitors, provide remembrances of their visit, and provide a minimal amount of convenience items. Since there are no water or food services anywhere near this facility, the association will sell bottled water and small snack items such as granola or energy bars.

The focus of the bookstore will be on items about high altitude research, pine forests, natural history of the west, and quality souvenirs.

- Objective: The bookstore should provide a service to visitors and serve the facility; it should not become the focal point or dominant function of the facility.

- Objective: Design the bookstore space so that it may be a full self serve store where the on-duty desk ranger can provide visual security. The area should not be so large or contained as to require its own check out clerk and space.

Goal 4: Provide enough space in a small theater room that can hold a typical class of 30 students in a casual "living room" home theatre style.

- Objective: Include two spaces for wheelchair access. Design should also include a method of raising a portion of the rear seats for easier viewing.

- Objective: Configure the seating in such a manner so that the room could be used for a meeting, conference, or seminar for approximately 20 people.

- Objective: The desired atmosphere of the theatre room is that of a comfortable, non-formal cabin-like living room/theatre room, rather than an institutional theatre.

Exhibit Recommendations and Cost Estimates

The visitor center will be approximately 2,050 ft^2 with the following space allocations:

Exhibit Hall: 950 ft^2
Bookstore: 365 ft^2
Theatre: 385 ft^2
Office/library/work area: 240 ft^2
Storage/employee break room: 160 ft^2

The ambiance of the visitor center facility will contribute to the beauty of the interpretive site as visitors crest the slight hill leading into the parking lot. The interior architecture of the building will be determined by the style of logs used for construction. All inside portions of exterior walls will be left in their natural log state.

The interpretive exhibits should convey a feeling of beauty and serenity when informing visitors of the natural, cultural and scientific significance of the ancient trees and their surroundings.

Due to limited electrical power and the tone and ambiance of the area, electronic and sound producing exhibits will be limited.

The interpretive effort will be have an outside component so as to allow for non-staffed interpretation during shoulder season and before/after hours visitation. The outside exhibits should be in close proximity to the building to be of use during staffed presentations and should portray the basic or core "bristlecone story". The interior exhibits should also more focus on stories that are more difficult to tell in an outside setting.

The main auditorium/exhibit area will have the following functions:

1. A location to shelter from inclement weather
2. Interpretive exhibits, including tactile or interactive displays that cannot be presented outdoors
3. An indoor location to conduct both formal and informal interpretation
4. An informal rest/waiting area designed in a lodge/living room type of setting with a small fireplace that can be used for either wood or propane gas operation
5. A small wall space will also be dedicated as a gallery wall for rotating art works. The bristlecone forest is a popular destination for photographers and artists and a gallery area will both provide an outlet for these works and an area for visitors to appreciate the beauty of the trees in various mediums.
6. The free-standing reception or information desk

Interior Exhibits

Bristlecone Cross-section Table Exhibit

This cross-section of an extremely old bristlecone will rest atop a 12" pedestal which in turn sits on a free-standing table. It will be covered by elegant glass with a timeline etched on the top (significant events). The sides will have exhibit panels extending nearly the length of the table angled at 45° from the top of the table to the top of the pedestal. The following stories will be interpreted:

- A description of "slab growth" (i.e. how the slab can be so elongated instead of a concentric ring of growth). This will describe the

manner in which bristlecone pine growth, begin to die, sluff off bark, and yet continue to grow in a slab-like manner.

- The other side of the table will have an exhibit panel running the length of the table interpreting the trees' relative place in our history.

Space requirement: exhibit will be on a 2.5' wide by 6' foot long table in the middle portion of the auditorium.

Cost Estimate: The University of Arizona, Laboratory of Tree-Ring Research has offered to provide a finished bristlecone slab suitable for display. The previous slabs were also provided by this partner organization. The etched glass timeline raised atop the slab will cost approximately $900; the table cost will be in the $600 range. Each side of the slab will have long but only 10-12 inch tall exhibit panels running along the length of the slab. The design and fabrication of these two panels will be approximately $3,500. The total cost of this exhibit will be approximately $5,000 with planning and additional design estimate to bring the total cost to $7500.00

Discovery Table

This 6' table will contain several small tree rounds, small pieces of significant rock samples, pine cones from conifers of the White Mountains and other hands-on exhibits. It will also contain a small dissection magnifier under which will be two simulated (3X normal size) increment bore samples. Visitors will be invited to match up and cross-date the samples. This exhibit will need a "Discovery Table" sign or similar descriptive panel to indicate to visitors what the table is all about.

Space requirement: 6' of wall space with 2-3' of space on each side. A 2.5' wide table will rest against a wall.

Cost Estimate: Most of the materials for this hands on discovery are either currently available or are easily procured locally at little or no cost. The table will cost about $800, the magnifier is approximately $3,000, and the "Discovery Table" sign is estimated to cost about $900 including design. The total cost of this Discovery Table is exhibit is estimated to be approximately $4,700.

Touchscreen Exhibit

This exhibit is 100% complete and only needs a table (matching design with other tables/front desk) for public use. This exhibit presents four short narrated video presentations from which visitors touch the appropriate screen icon to select their choice. Each of the presentations is then shown on a 17" monitor and then the screen reverts back to a main menu. The length of the various options ranges from 1.5 to 2 minutes. The intent of these short DVD presentations is to show images that are not readily available to visitors, or in the case of the Patriarch Grove- to show what the area looks like in advance of their visit (which will answer the very common question of: "What does Patriarch Grove look like?") The subjects of the DVD include a brief exploration of Patriarch Grove, a winter trip through the bristlecone pine forest, bristlecone pines throughout the intermountain west, and an increment boring demonstration.

Space requirement: a 2' wide by 3' long table, flat against a wall or in a corner.

Cost Estimate: This exhibit is currently in place and the only additional cost

will be a table that matches the other free standing tables in the exhibit hall. Estimated cost for this small table is about $600.

Natural History Reference Pages

This exhibit will allow visitors to leaf through a free-standing display containing the following 8.5" by 11" (approximate size) high pressure laminate "pages" of the 25 most common plants, 10-15 most common animals, 10 or so most common wildflowers, and most common rocks and cloud conditions that are observed in the White Mountains. It will be the main herbarium reference.

Space requirement: A small 2' section of wall space.

Cost Estimate: The display will entail a small matching table at an estimated cost of $500, a small wall sign indicating what the display is about ($600), a box to contain the 50 or so pages ($300) and the cost of the pages. Assuming that the local staff will provide the text and images, the cost of these pages is estimated to be approximately $10,000. This is based on about 2 hours of design work and approximately $100 production cost of each reference page. Total estimated cost of this exhibit is approximately $11,400.

Interior Wall Panels

Geology Exhibit

This 3' by 4' panel will tell the story of the geologic evolution of the White Mountains. It needs to contain a 500 million year timeline that shows the inland ocean that preceded the White Mountains, the uplifting of the mountains, the explosion of the crustaceans, then the re-colonization after the last ice age. Sub-story: the dolomite competition story including the ecologic irony of good/bad growing conditions for bristlecone pine.

Space requirement: 3' x 4' or equivalent wall space.

Research History Exhibit

Beginning with A.E. Douglass and his development of dendrochronology, this exhibit will emphasize the research of climatic and environmental change as measured through tree rings by Douglass, Schulman, Ferguson, and Michaels. It will trace the historical development of tree-ring research. Sub-story: the international search for even longer chronologies spurred on by dendrochronological research of the bristlecone pines. This international story should appeal to our international visitors and use the examples of ice core drilling, South American tree rings searches, and German and Finnish oak tree (bog) research.

Space requirement: 3' x 4' or equivalent wall space.

Management/Sustainability Exhibit
This exhibit panel will include a brief history of the previous facility, its demise and the overwhelming public support for a new facility. It will focus on our effort to produce the most environmentally sustainable building that resulted in the LEED certification (plaque or certification can be part of exhibit). Sub-story: the preservation of the Ancient Bristlecone Pine Forest and recent wilderness designation of a portion of the White will also be included.

Space requirement: 3' x 4' or equivalent wall space.

The Trees that Re-Wrote History

This exhibit is planned as a series of small panels adjacent to each other in a three-plex arrangement. It should have a main title panel. Each one of the smaller panels will cover the following subjects, from left to right:

- Radiocarbon dating – a brief overview of the radiocarbon dating process explained in an easily understood manner. This exhibit should explain what is radiocarbon dating is and how it is used throughout the world – panel should end with the teaser of . . . but a problem was discovered with the process.
- Use of wood and recalibration story
- Reinterpretation of diffusionist theory

Space requirement: Approximately 6' of wall space.

Cost estimates for interior exhibits: Each 3' by 4' panel will entail a fabrication cost of approximately $2,500. The design costs will run approximately $1,500 with a potential art charge of about $1,000 per panel. These costs are predicated on local staff provided the rough draft text. Total cost per 3' by 4' panel will be approximately $5,000 per exhibit.

The costs for the three panel series ("Trees that Rewrote History") will be slightly less due to a size reduction; these panels are estimated to cost approximately $4,500 each.

Total cost for all interior wall exhibit panels is $28,500

Cost Summary:
Cost of interior table exhibits:
$24,200

Cost of mural rail exhibit:
$17,000
Cost of interior wall exhibits
$28,500

Total estimated cost of all interior exhibits: $69,700 X 25% cost overrun = $87,125

Wall Mural of the White Mountains

This 5' by 10' (approximate) wall mural will show many of the elements of the natural history of the White Mountains that are not contained in other exhibits. The perspective of the exhibit should be south to north beginning with the pinyon-juniper forest and ending at White Mountain Peak. The mural will showcase the Native American history of pinyon nut collection and their high altitude camps. It will also feature many of the common plants and animals that have shown adaptive features for the high altitude sky island.

The mural will be the showcase exhibits of the new visitor center. They It will be the main focal point as visitors enter the facility and will most likely be located on the wall opposite of the entry doors. The mural should be accompanied by rail-style exhibit in front of the painting that the visitors are viewing. The specific subjects of the mural will be included in the art contract as they will be elements of the overall interpretive efforts that cannot be left to artist discretion.

Space requirement: 10'of wall space with at least 2' buffer on each side for a minimum 14' of wall space. Floor space for exhibit panel in front of mural: 8' in length but out away from the panel by about 6'.

Cost estimate for mural exhibit: The actual wall mural will be provided

by the Eastern Sierra Interpretive Association as they have received insurance money for a replacement mural. However, the rail exhibit will be included in the visitor center exhibit expenditures. The exhibit will consists of long sections interpreting the natural and cultural history of the White Mountains as depicted in the mural. The fabrication cost for each of the three sections is estimated to be approximately $2,000 with an equal amount of design and art charges. Exhibit cost is estimated to be $12,000 with an additional change of $5,000 for the construction of the rail structure. Total estimated cost of the mural rail exhibit is approximately $17,000.

Other Interior Space Requirements

1. Gallery Wall: This section of the visitor center will include pieces of art work centering on the bristlecone pines and the White Mountains. The exhibit will be rotated yearly or bi-yearly.

Space requirement: A 10' section of wall, preferably inset or recessed to create a gallery-like look.

2. Sitting/resting area: An area for visitors to sit and rest is needed due to the elevation of the facility. Details on this area can be found in the building prospectus.

Space requirement: This is dependent on whether this area ends up as a corner sitting area of flush with the wall. Room should be allotted for 6 to 8 visitors to sit.

Audio Description

An audio description is required for all Forest Service Visitor Centers (per 36 CFR Part 1194). This CFR specific language is identified in Appendix G and based upon the assumption that if person must be able to see in order to comprehend the content of a permanent exhibit, video, film or other presentation, developed by or for a federal agency, audio description is required. Audio description provides narration of all the visual elements of content, settings, and images of exhibits, videos, television/film, museum exhibitions, and other events.

An audio described tour concisely and completely describes the exhibit and allows the listener to experience the exhibit as other visitors do including by selecting the portions of the exhibits they wish to discern in greater depth. Trained audio describers know that less is more. Audio description writers choose words with precision to conjure vivid and lasting images that enable people who are visually impaired to fully understand and enjoy the exhibit, video presentation, film and so forth. Audio description will be included as part of the exhibit design and installation contract to correspond with exhibit design and development. Consideration needs to be taken into account regarding sound pollution/corruption in the event multiple audio/visual mediums are selected. The finishes in the building allow for sound to bounce within the space and can interfere with the duties and services of the visitor center. The medium used for this should contain the sound to the visitor who is using the device and not project out to the rest the facility. Other sound absorption techniques should also be used.

Cost estimate for audio description: While the audio description will serve low- or no-vision people, it can also be considered another opportunity to

enhance all visitors experience and learning opportunities beyond visual or tactile learning. Audio descriptions can vary from very basic navigation and description of exhibitory, to more engaging, and interactive presentations. For the size of the building and content, designers should plan on between $10 – $15,000 for development of this description, recording and an additional $5,000 for listening devices. The audio description development should be a part of the design process, not an afterthought when all the exhibits are completed.

Exterior Kiosk Panels

This 3-panel kiosk is to be located immediately adjacent to the visitor center so that visitor center personnel can use the panels to help instruct groups during outside interpretive talks. It is best located so that a portion of the group may elect to stand or sit (based on availability of benches) in the shade.

The exhibit concept for this treatment is to present the core or basic bristlecone story outside so that after-hours visitors have the opportunity to learn the basics of the natural history of the ancient bristlecone pines

Exterior Panel 1: Introduction to the Great Basin Bristlecone Pine:
This panel will provide basic introductory information to the natural history of the ancient trees. This information would include the basics of where the species grows, an overview of why the trees live to be so old, the conditions they must adapt to (further explored in panel 3) and how scientists determine the age of the trees.

Sub-story or connector panel: A map of the western United States showing the locations where bristlecone pines grow.

Exterior Panel 2: The Principles of Cross-dating:
Continuing from the principles of determining the age of a tree, this panel would explore the techniques of cross-dating which leads to a very long (8,500 years) continuous tree-ring chronology (CTRC). This exhibit would need to rely on expertly drawn illustrations to show the concept of aligning the various tree-ring samples into a chronology.

Sub-story or connector panel: An explanation of the climatological importance of a CTRC and the role that the ancient trees play in the global climate change debate.

Exterior Panel 3: Adaptations of the Ancient Bristlecone Pine:
A beautifully illustrated drawing of a bristlecone pine will provide the details to examine the various elements of adaptations that have allowed these trees to attain their remarkable age. The drawing (or painting) will need to be full panel size as it is anticipated that it will be used by naturalist staff to show the various elements of adaptation and longevity that frequently are the subjects of discussion in a naturalist talk.

Space requirements: It is anticipated that these panels will be arraigned in an open kiosk type of format requiring approximately 10' wide by approx. 4' deep.

Cost estimate for exterior exhibit panels:
The cost for these panels is similar to the interior panels in terms of fabrication and art work. The three larger panels will cost approximately $5,000 each with the smaller panels costing approximately $3,500 each. The

total cost does not include the structure needed to mount the panels on since that will be a cost associated with building construction.

Total cost for exterior exhibits: $28,500 x 25% cost overrun = $35,625
This cost includes planning and design, artwork and fabrication. It does not include research, text writing, or installation. It also does not include the construction costs of a front desk, entry or welcome sign, and the cost of any exterior exhibit kiosk. For information purposes, those costs are included below:

- Exhibit installation: Estimated $20,000
- Construction of a two person, free-standing information desk kiosk: $50,000
- Welcome/Entry Sign: $15,000 – Including design & fabrication
- Exterior exhibit panel kiosk: $15,000 (Only a rough estimated – actual cost to be determined by design not yet completed)

Total estimated cost for all exhibits: $122,750

Cost Estimate Summary

Total estimated cost for all exhibits: including planning, design, art work, fabrication, tables, equipment, structures, kiosks and installation:

Cost Estimates for Schulman Grove VC Exhibits	
Interior	
Bristlecone Cross-section Table Exhibit	
Tree ring slab - donated by University of Arizona	$0
Etched glass timeline raised atop the slab	$900
Mounting table	$600
Slab interpretive panels design/fabrication	$3,500
Exhibit design, construction, fabrication/install	$2,500
	$7,500
Discovery Table Exhibit	
Mounting table	$800
Magnifying glass system	$3,000
Signs and graphics	$900
Exhibit design, construction, fabrication/install	$500
	$5,200

Computer Touchscreen Exhibit (reinstalled)	$600
Natural History Reference Pages	
Mounting table	$500
Small wall display	$600
Container box approximately 50 high pressure laminate pages	$300
Graphic design and text done by Forest Service staff ($10,000 in staff resources).	$0
Page fabrication	$10,000
	$11,400
Subtotal for all interior table exhibits	*$24,700*
Interior wall panels 3x4, design & fabrication, installation	$28,500
Mural rail exhibit	$17,000
Construction of a two person, free-standing information desk	$50,000
Audio description and listening devices	$20,000
Exhibit installation and remoteness of site factors	$20,000
Subtotal for all interior	*$160,200*
Exterior	
Welcome/Entry Sign, Including design & fabrication	$15,000.0
Total cost for exterior exhibits: $28,500 x 25% cost overrun	$35,625
Kiosk materials and stanchions	$15,000
Contract administration	$23,000
Total all work for exhibits at Visitor Center	*$248,825*

Exhibit Design Criteria

The ambiance and feeling of the room should be in concert with the overall building design, which will be a log/mountain cabin design. The interior walls will be the inside portions of the logs with any non-log walls being constructed of rough sawn or comparable rustic material. The facility will have an open beam architecture using logs or rough sawn beams and/or timbers.

The exhibits for the new visitor center will need to blend into the interior environment and complement the mountain home/log cabin living room look and feel. The visitor center tends not to be noisy or high energy but rather should portray a comfortable relaxed area for learning, casual information exchange and resting at the 10,000 foot elevation.

The main auditorium will have three available walls on which to design exhibit space. (The fourth wall will be part of the bookstore.) One of those three walls will be the main glass, ambient light source – most likely facing north. Of the two remaining walls available for exhibits one wall or corner will be compromised by the rest/seating area.

The colors should primarily be earth tone and should complement the log wall finished color.

Fonts should be more informal than formal or contemporary.

Artwork should all be done by the same artist to provide a common look that should be the same as whatever art work is used for the adjacent outside exhibits.

The exhibits should use a common layered approach so that visitors can select the level of information that suits their needs.

The look, tone, feel, color and language of the exhibits should convey the quiet reflection of visitors at this remote sight, rather than those at a busy high junction visitor center.

See Appendix F for additional exhibit design guidelines that will be included in exhibit design and fabrication contract materials.

Dr. Schulman discovered over 20 trees that are more than 4,000 year old, including the world's oldest— the Methuselah Tree—4,739 years old in 2009.

Notes

Off-site Interpretive Opportunities

Patriarch Grove:
This grove of bristlecone pines is located in the far northern end of the designated forest. While the trees are not especially old, they are some of the most scenic as the grove is located at tree line. The landscape is stark and bare but pristine with stunning vistas far off into the basin and range of Nevada. The largest bristlecone pine in the world is located at Patriarch Grove. It is only 12 miles in distance from Schulman Grove but takes 45 minutes along a moderately maintained dirt road.

The grove is a developed recreation site with modern vault toilet, picnic tables, exhibits and trails. Visitors at Patriarch Grove find a mostly level ¼ mile nature trail with anodized aluminum exhibit panels interpreting the high altitude living condition for both plants and animals. The trail wanders past the Patriarch Tree, the largest bristlecone pine in the world. Another short trail at the grove (1/2 mile in length) leaves the parking lot for an uphill hike to a high point view spot then loops back to its starting point.

Patriarch Grove

Interpretive opportunities that exist at Patriarch Grove include the following:

- A ¼ mile nature trail with exhibit panels along the trail
- An exhibit interpreting high altitude tree line advance and regeneration
- A monument plaque commemorating the Patriarch Tree

Sierra View:
This view point is located along the White Mountain road 2 miles south of Schulman Grove. It provides a stunning view of the Sierra range from Yosemite in the far north to Mt. Whitney at the southern end of the view. It is especially spectacular as travelers have been winding their way up a canyon when they "top out" at the view point.

At that location there is parking for 8 vehicles, a restroom, and exhibits along a viewing platform. The exhibits only include mountain profiles in a deeply etched aluminum panel. They are quite old and the entire view site needs updating. This update should include a view scope and updated exhibits. This exciting opportunity should be completed in time for the grand opening of the new visitor center facility (projected to be mid-summer 2011).

Grandview Campground:
This 26-unit campground is located approximately 5 miles south of Schulman Grove along the White Mountain Road. While it is a popular campground for visitors to the bristlecone pine forest, it rarely fills to capacity. It is a minimum service facility with no water or at site trash services. There is no camp fee at this site but a voluntary maintenance donation program brings in maintenance funding adequate for basic upkeep.

Grandview Campground has an old style amphitheatre with screen and campfire ring. It provides a very inviting venue for old fashioned campfire programs and interpretive talks. Weekday use of the campground does not provide enough visitors to make programs successful but Saturday night campfire programs have been very popular in the past. Grandview Campground also has information bulletin boards for informal printed interpretation.

Ancient Bristlecone National Forest Scenic Byway: This scenic byway runs along State Highway 168 from near Big Pine to its terminus at Patriarch Grove. The exhibits for pullouts along the scenic byway have been completed and are slated for installation in the summer/fall of 2009. The theme for these byway exhibits is the natural and human history of the various life zones of the White Mountains.

The subjects for these exhibits include:

- The Zurich Railway Station in the Owens Valley (now gone)
- The desert scadscale scrub of the Owns Valley desert floor
- The Tollhouse Road rest stop (the last private toll road in California)
- The pinyon/juniper forest
- Deep Springs Lake and Playa
- Rain Shadow effects on the White Mountains (at Sierra View)
- Dolomite soil and it effect on the distribution bristlecones
- Fire and it role in the White Mountains
- Tree line advance and high altitude growing conditions.

The Ancient Bristlecone NF Scenic Byway will also have a brochure showing points of interest where an exhibit is not possible due to road safety issues.

Conservation Education

Conservation education (CE) opportunities are coordinated with the White Mountain Ranger Station (WMRS) as the Bristlecone Visitor Center is more narrowly focused on interpretation of the bristlecone pines and the White Mountains environment. Conservation education program delivery is best delivered through the ranger station due to the proximity to much larger local population base, motel and camping visitors. The logistic difficulties of a site without phone, water or other services make delivering conservation education programs more difficult.

The exhibits that are planned for the bristlecone visitor center include subjects on climate change and research in addition to land management classification issues in the White Mountains. Conservation education messages are presented in daily ranger patio talks as well as ranger-led interpretive hikes and in other interpretive delivery methods.

The current CE program includes an open house celebration day in the bristlecone pines in conjunction with the White Mountain Research Station, conservation messages within our interpretive scheduling, and new for 2009 a children's bristlecone art day presented (under contract) by a local natural history artist specializing in children's art.

The following are recommendations for strengthening the conservation education program at the Bristlecone Pine Forest Visitor Center. These activities are in close coordination with the White Mountain Ranger Station.

1.) Expand the role of the children's nature program coordinator at the WMRS to include additional CE activities at the bristlecone visitor center.

2.) Develop a "special places" traveling exhibit trailer that focuses on current CE topics in addition to the special places of the eastern Sierra. Note: Trailers are available and funding can be applied for through the More Kids in the Woods grant program.

3.) Include a "Kids Corner" on both the Forest Service and Eastern Sierra Interpretive Association websites.

4.) Revise and reprint the bristlecone pine forest kids' activity booklet. This can be accomplished as part of the internship program that has been previously discussed.

5.) Past experience has shown that 4th grade is most frequently the grade level that teachers have shown the most interest in program guides. As part of the children's nature program coordinator position a program or curriculum guide can be established to teach children about both the natural history of the ancient trees and about broader conservation education topics. This curriculum along with associated demonstration projects can be packed together in an education locker or box, easily transportable for teachers.

Notes

Appendix A: Discovery Trail Exhibit Panels

Panel One – Discovery

Discovery is the result of a unique combination of curiosity, observation, knowledge, and persistence. Dr. Edmund Schulman was searching this area in 1953 for very old trees in an attempt to uncover the secrets hidden in thousands of years of tree growth. His work soon paid off when he discovered living bristlecone trees over 4,000 years old along what we now call Discovery Trail.

This one-mile loop trail will take less than an hour to walk. Interpretive panels along the way relate the story of the discovery of the oldest trees in the world: the ancient bristlecone pines. Rest benches are located along the trail; enjoy your walk and see what discoveries you can make on your own.

The interpretive trail signs along the Discovery Trail were produced through the generous donations of the White family in memory of Jacqueline White Van Dalsem. Jackie loved the mountains, the trees and the serene beauty of the wilderness. The majestic bristlecone forest is a reminder of her love of life.

Panel Two – Rings of Life

Trees usually produce a growth ring every year. Since growth rings respond to climatic changes, a long series of these rings (a tree ring chronology) can provide a clue to changing weather patterns. Dr. Schulman was searching the western United States for trees with these long patterns of growth rings in an attempt to discover past climatic conditions. This pursuit led Dr. Schulman to the White Mountains.

Standing before you are the hardened remains of a toppled ancient. This bristlecone was over 3,200 years old when it died in about 1676. Look closely at some of the exposed limbs and roots, and you will see that the annual growth rings are very close together. In some bristlecone pine trees, over 100 years of tree rings are contained in just one inch of growth!

Panel Three - Life Down Under

Plant evolution in the Great Basin can result in unique adaptations to an arid environment. Roots of the bristlecone pine grow close to the surface of the soil to capture scarce moisture before it evaporates. The toppled trees near you display these shallow root systems.
Root exposure can occur as a result of soil erosion. The average rate of erosion in this grove is one foot of soil loss per thousand years. Some scientists have used this information to estimate the ages of ancient trees by measuring the amount of erosion. Others have suggested that some trees die as a result of diseases associated with these exposed roots.

Panel Four – Pathways of the Ancients

Dr. Schulman had been taking core samples from trees on the other side of this drainage when he ventured into the grove of bristlecones in front of you. He took a core sample from one of the old, gnarled trees and headed back to his camp to count the annual growth rings after dinner. In stunned excitement he continued counting rings beyond the year BC 2046. He had discovered the first tree in the world known to exceed 4,000 years in age, and it was still living!

That 4,000-year-old tree was only one of many discoveries that Dr. Schulman was to make in this area. As you walk this section of trail past many of these ancient trees, imagine that late night in 1953 when Dr. Schulman kept on counting, and counting, and counting . . .

Panel Five - Subtle Differences – It's in the Genes

After the last ice age ended (approximately 10,000 years ago), the bristlecone pine apparently migrated north from its southern ice-age retreat. From one common ancestor, three closely related species seem to have evolved: Pinus aristata – the Rocky Mountain Bristlecone, Pinus balfouriana – the Foxtail pine of the Sierra Nevada range, and the Pinus longaeva – the Great Basin Bristlecone.

Although all of the bristlecones in this area are of the same species – the Great Basin Bristlecone – individual trees reveal genetic differences, demonstrating that the species continues to evolve. In front of you are two old bristlecone pine trees; one has a twisted trunk, while the other one grows straighter and taller. Behind you are two trees which have first year cones of different colors. The purple cones are the most common; the green ones are a genetic variation.

Panel Six – Dr. Edmund P. Schulman

In 1953, Dr. Edmund P. Schulman was searching this grove of bristlecones for old trees to extend his tree ring chronology. With his discovery of the "Pine Alpha" tree, he became the first person in the world to document 4,000-year-old trees. He continued his persistent search and in 1957, discovered the oldest living tree in the world, the Methuselah Tree. This ancient is located in Methuselah Grove, a four mile round-trip hike from here.

The significance of Dr. Schulman's discovery can scarcely be overstated. The continuous bristlecone tree ring chronology, including living and dead wood, now extends back nearly 10,000 years. Data from these tree rings supports important scientific research on radiocarbon dating, past climates, air quality, frequency of fires, and water supply trends.

Although Dr. Schulman died at the age of 49 in 1958, his legacy of discovery is still with us today.7

Panel 7 – White Rocks and Tough Roots

It has been said that bristlecone pines "prefer" the dolomitic soil where they are

found in greatest concentrations. Bristlecone pines don't have a choice in where they grow; they are found in soils with high concentrations of dolomite because few other plants can survive in such alkaline soils. This lack of competition gives them the opportunity to establish a strong, viable seedling. In addition, the light colored dolomite promotes cooler soil temperatures by reflecting heat, thereby making more water available to the trees by reducing evaporation of moisture from the soil.

Notice the hillside in front of you. To the east of the drainage is the familiar white colored dolomite supporting a grove of bristlecones.

The soil to the west of the drainage supports many other species of plants which grow faster than the bristlecones and thereby outcompete them for scarce nutrients and water. As plants continue to invade the rocky slope to your left, their roots will slowly break apart the rocks to help create life supporting the soil.

Panel 8 – Appearances Can Be Deceiving

Dr. Schulman began his search for old trees by examining the bristlecones on the north-facing slope directly across the canyon. He had studied the Giant Sequoia trees in the past and, like many of us, he might have thought that the larger, taller trees were the older ones. Not so with the ancient bristlecones! In a curious twist of natural history logic, it is the shorter, weather-beaten, gnarled trees that can live the longest.

The dry, exposed, south-facing slope that you are standing on leads to slower growth in the bristlecone pines, producing a hard, dense, resinous wood. This hard wood is much more resistant to disease and insect penetration, thus promoting longevity.

Dr. Schulman was much closer to the discovery of his dream than he knew. His unplanned, late afternoon stroll across the canyon changed forever both his life and our understanding of the natural history of the ancient bristlecone pine.

Framed by the majestic bristlecone pines in front of you, the southernmost glaciers in North America stand out as islands of ice and snow high atop the Sierra Nevada range. Nestled above Big Pine Canyon, 35 miles from here, these glaciers are remnants of the last ice age.

Notes

Appendix B: Boardwalk Interpretive Panels

Discover the Difference
The Trees of Schulman Grove
The bristlecone pine and the limber pine are the only two trees able to survive the harsh environmental conditions here in the White Mountains. At first glance they seem similar, but look carefully and you will discover the distinct characteristics of each tree.

Pick up a pine cone along one of the trails here at Schulman Grove.
Does it feel prickly? Is it full of slender bristles? If so, now you know why they are called bristlecones! Please remember to put the cone back where you found it for others to enjoy.

How to identify a bristlecone:
--branchlets resembling curved foxtails
--dark green, short curved needles in clusters of five growing along the branches
--purple cones that grow at tips of branches and fallen brown cones with a bristle on each scale
Take a look at the Great Basin bristlecone pine standing in front of you.

How to identify a limber:
--longer, gray-green needles in dense tufts at the ends of branchlets
--cones without bristles
--very light bark on young trees
Watch for the stands of limber pines growing along the road. You can also see one in the parking lot island.

Secrets of Old Age

Ancient bristlecone pines have a special look:
--spikey dead tops
--bare wood on limbs and trunks
--distorted, polished limbs and exposed roots
--thin strips of bark growing up the tree

Yet, the trees growing near you have a different look. These bristlecones are in a sheltered location, normally thought of as "good" growing conditions. They are tall, full and upright. But these youngsters just don't live as long as the ancients.
Their wood is softer, making them more susceptible to insect invasion and disease.

Look at the hillside in front of you. These bristlecones are growing on a "poor" site—perfect conditions for old-age trees! The slope is steep, exposed, and the soil is very dry. Yet this is where we find the old, majestic weathered trees.

Ancient Seas to Ancient Trees
You are standing at 10,000 feet above sea level, and yet the ground beneath you is an ancient sea bed. How can this be?

The hillside in front of you is comprised of a light-colored rock and soil called dolomite. Small particles of dead organisms, sand and silt settled on the bottom of an ocean forming deposits of sediments some 650 million years ago.

Around 350 million years ago, a long and complicated series of geologic events began. Major collisions of the Pacific and North American plates folded, faulted and uplifted this ocean bottom from below sea level to above 10,000 feet! The White Mountains came into existence. Most plants cannot tolerate dolomitic soil, but bristlecone pines manage to endure it. Competition can be intense among plants found in more fertile soil— But here in the dolomite, the bristlecones grow unchallenged.

A Tale of Two Cones
And Other Good Stories

Do you ever wonder how trees reproduce? Bristlecones grow both male and female cones on the same tree. In mid-summer of the first year, the rust-colored male cones release clouds of fine yellow pollen which fertilize the female cones.

Unlike most other conifers, female cones of the bristlecone pine take two years to fully develop. In the second year, the cones turn a rich purple or green, produce large amounts of glistening sap, then turn brown and release winged seeds. See if you can find the first and second year cones on the trees near you. Watch out for sap!

Birds and animals play an important role in the distribution of bristlecone seeds. While some seeds journey by wind and lodge in rocky crevices, others are gathered and eaten or stored for the winter. Often these food caches are forgotten, leaving the seeds "planted" and ready to sprout and grow when sun, soil and moisture conditions are favorable. When you see young seedlings on your walk, think of the squirrel or Clark's Nutcracker who may have planted them.

'Sweet are the Uses of Adversity'
--William Shakespeare

When Shakespeare penned these words, the trees around you were already over 1,000 years old. Since that time, more than 400 harsh winters have come and gone. Adversity actually helps these trees achieve great age. But how can this be? Why would severe winters, dry summers and the rigors of a high altitude environment actually help a tree attain longevity?

The short, dry growing season causes bristlecone pines to produce very small amounts of extremely dense and resinous wood. This wood resists insects and animal pests, infection, heart rot and fire. Bristlecones also grow where other species cannot--in nutrient-poor soil.

The ability to use adversity to its advantage allows bristlecones to attain incredible ages.

Appendix C - Financial Resources

Previous operational costs for running the Bristlecone Pine Forest Visitor Center were derived from thee main sources: recreational force account funding, recreation fee funding and direct staffing, printing and exhibit development costs paid for by the interpretive association.

Cost for running the 6-month season of the visitor center were approximately $33,500 and are broken down into the following elements:

Seasonal staff salaries: $20,000
Printing informational handouts: $3,500
Vehicle: $ 6,000
Utilities, supplies and materials: $4,000
Total: $33,500

These figures do not include the salary of the district interpretive specialist who spends approximately 50% of his/her time on supervision, training and management of the bristlecone pine forest and visitor center. That 50% portion costs approximately $25,000.

The following is a three year average of the funding of the operational expenses

National forest recreation funding: $5,000
Recreational fee site funding: $18,000
Interpretive association direct funding: $ 8,000
Donations: $2,500
Total: $33,500

While future operational and maintenance costs are dependent on the size, scope and complexity of the new facility, it is planned that the visitor center will continue to be the type of facility that can be operated with minimum staff. The previous staffing scenario of two personnel on duty daily, except the shoulder season, is anticipated to be continued. The maintenance costs of a new facility are difficult to determine as is the utility costs. The new center is planned to be solar powered with only back-up generator power.

Not including the amortized costs of solar power equipment replacement and the sots of the interpretive specialist/site manager the future operations and maintenance costs can be anticipated as:

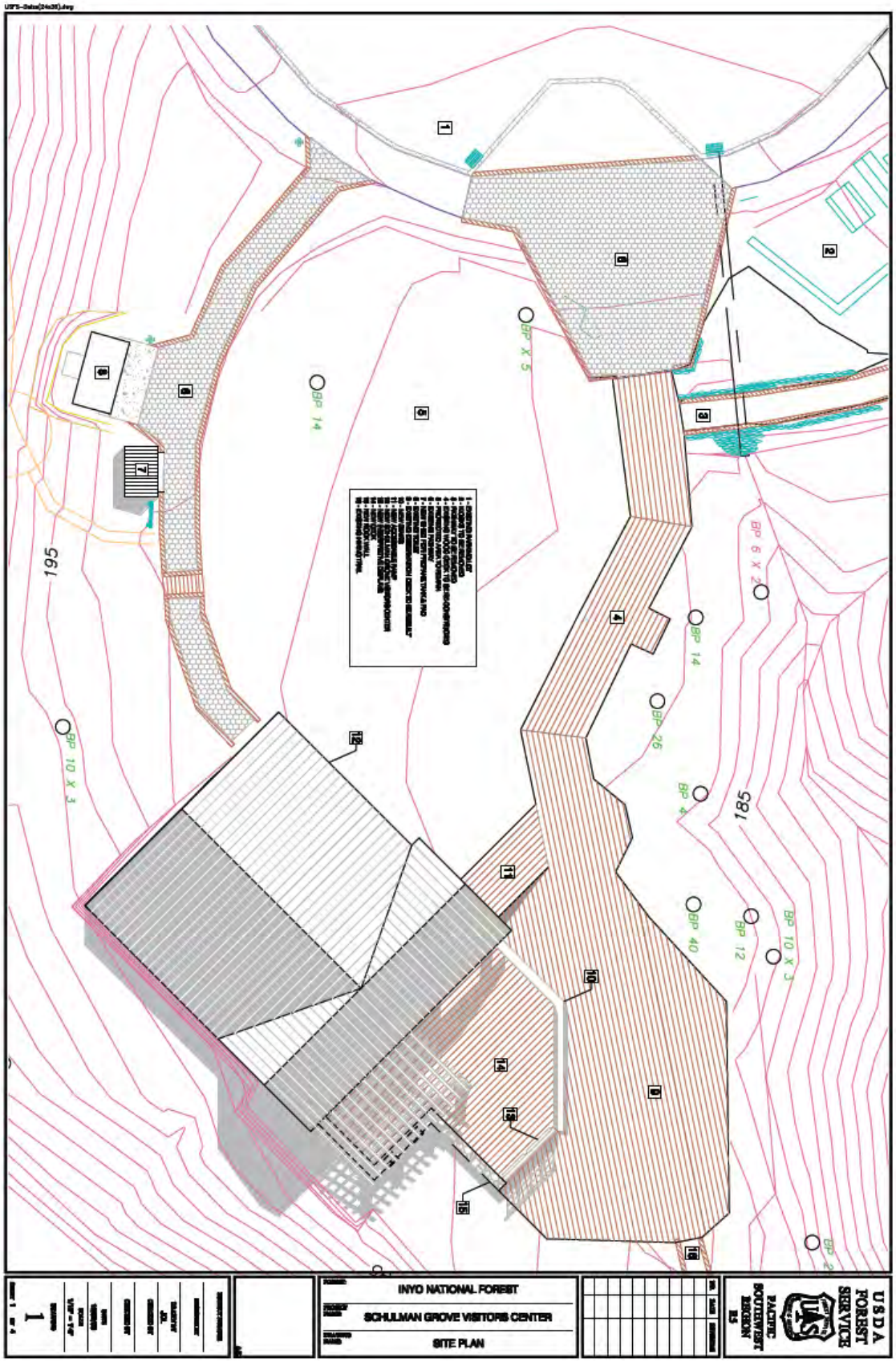
Seasonal staff: $25,000
Snow removal (spring): $1,500
Vehicle: $8,000
Printing: $4,000
Utilities, supplies materials: $5,000
Total: $43,500

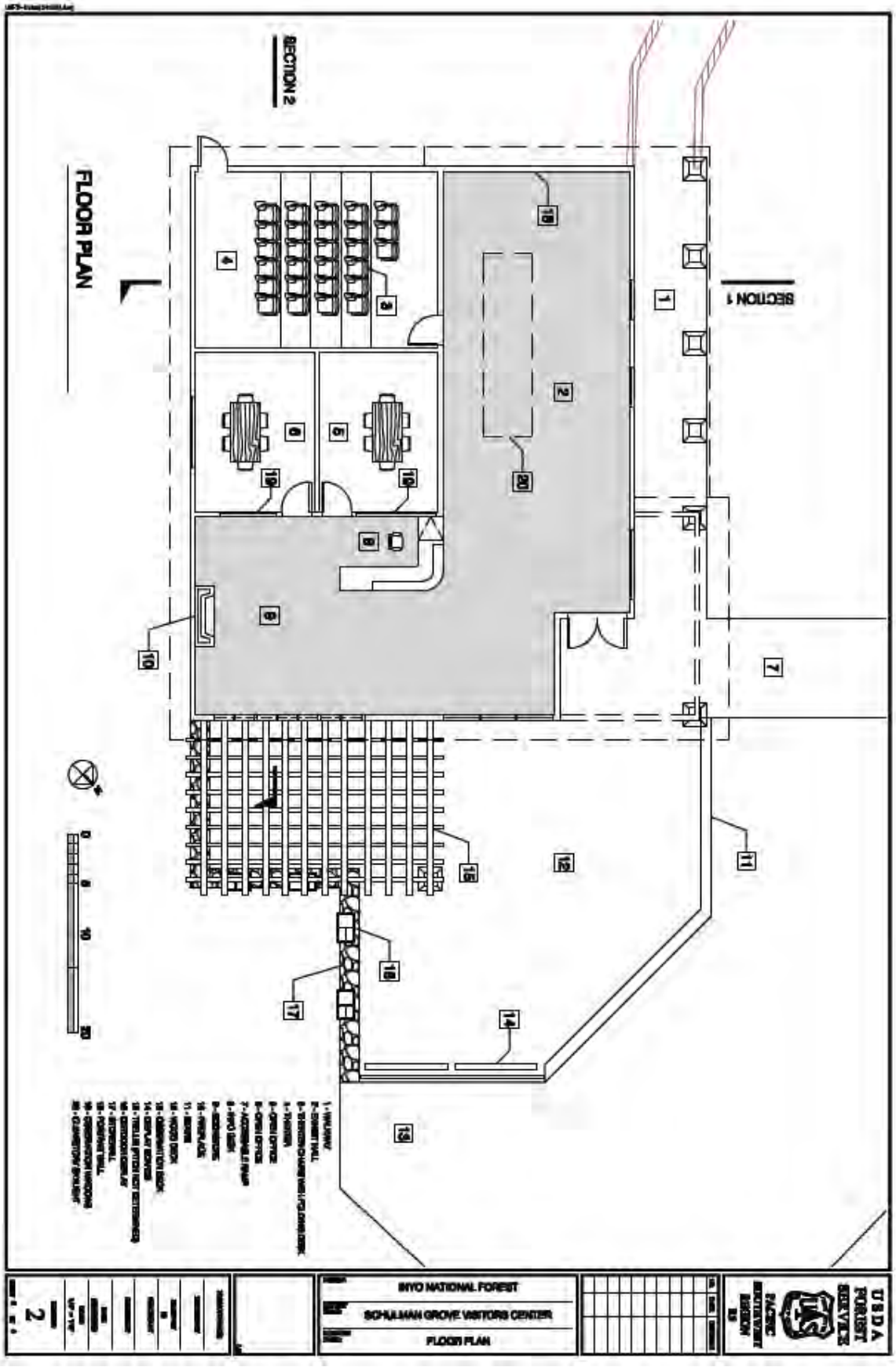
Notes

Appendix D - Ancient Bristlecone Pine Forest Map

Notes

Appendix E - Building Concept

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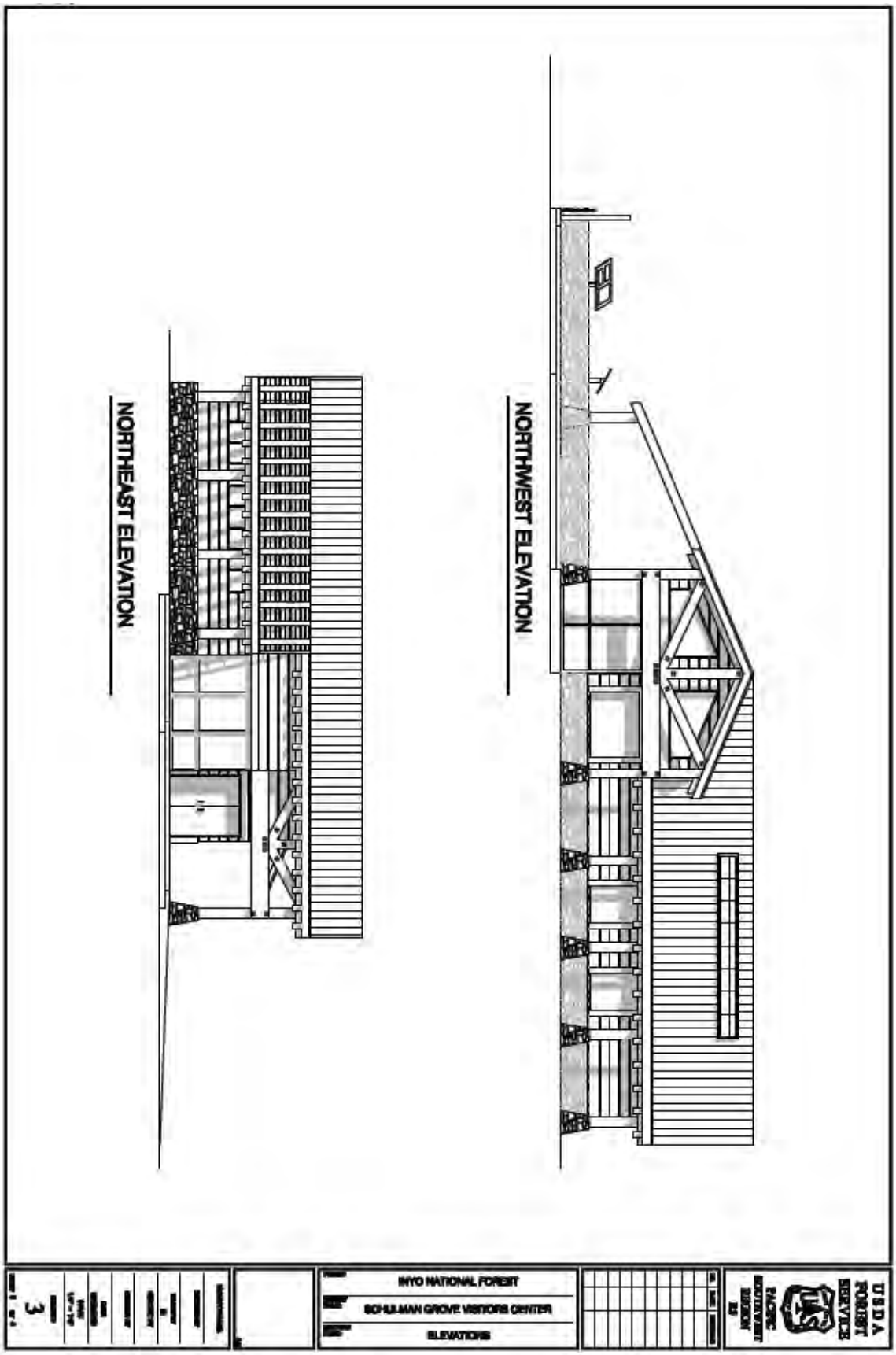
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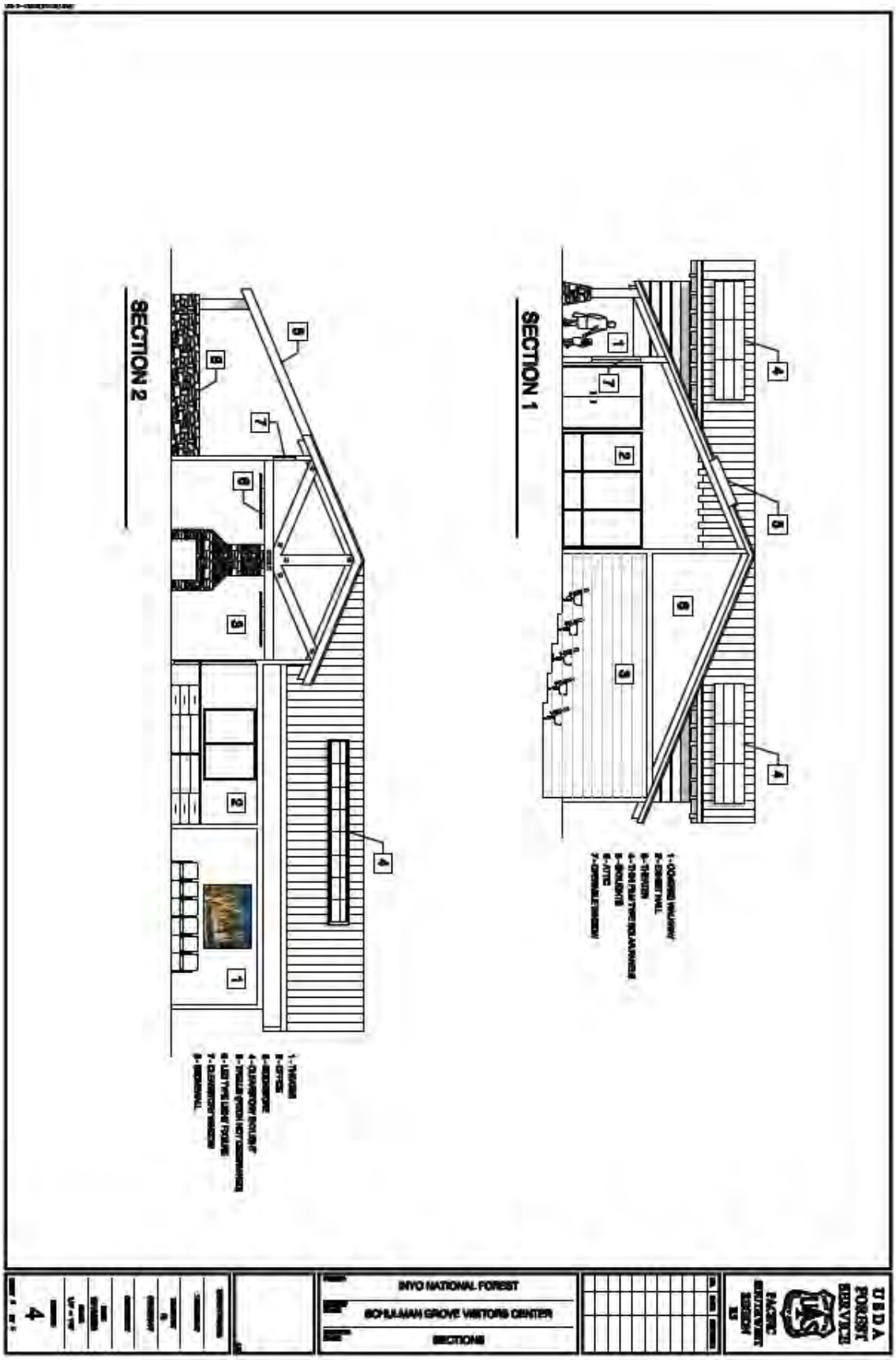
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Appendix F - Design Guidelines

Adherence to high-quality design standards is critical to the success of interpretive media. Visitors are more inclined to read information and abide by forest regulations if the material is presented clearly, aesthetically and professionally. These guidelines should be used to define standards and maintain consistency in the development of interpretive media. Guidelines should be adhered to throughout media-development phases.

1. All exhibits should be fabricated of similar materials; using computer digitized printing adhering to standards common within the graphic design industry.

2. All interpretive media should blend harmoniously with the interior and exterior environment, using design elements consistent with the Built Environment Image Guide (BEIG), Recreation Opportunity Spectrum (ROS), LEED certification level, local resources, and limited impacts to cultural and natural resources.

3. Interpretive media must strictly adhere to federal accessibility standards. Written material should be available in large print and audio format.

4. Facilities and program design should meet all current accessibility design standards and guidelines, using the Exhibit Accessibility Checklist, USDA Forest Service Accessibility Program, ttp://www.fs.fed.us/recreation/programs/accessibility/smithsonian.htm

5. Specifications for any and all artwork developed during the exhibit design phase should have provisions to provide on-going use for any future product development for the forest.

6. Media design should adhere to all federal, state, and local codes. Both interior and exterior exhibits should be designed so they are built of standard stock materials (where possible), which will permit them to be repaired and replicated locally (within a few hundred miles' radius), or be shipped within a few days' notice.

7. Specific narrative text, labels, captions, artwork, and signs for information displays and interpretive exhibits should be developed utilizing the themes, goals, and objectives outlined in this document.

8. The Forest Service and the exhibit designer will consult with the local Native American tribes in development of any exhibit with Native American themes, text, or similar elements as appropriate.

9. All exhibits should share similar lettering styles, layout elements, graphic techniques and materials utilized by the scenic byway wayside area exhibits.

10. Exhibit designs should be consistent with the building architecture and interior style and should use similar materials to identified in the building program of the building.

11. While guidelines for development of the exhibits are stated in this section, innovative presentation techniques and media are encouraged as appropriate.

12. Exhibits should be structurally sound and be designed to operate with minimal maintenance and attendance, as well as to minimize the risk of vandalism and/or other types of damage.

13. Exhibits should be designed to present no safety hazard or threat to visitors or resources.

14. Outdoor interpretive exhibits should be creative and consistent with the media being used inside the visitor center. Outdoor exhibit design should complement the style and coloring of the visitor center.

15. The exhibits should feature low-tech, high-touch exhibit designs. Interactive media should be used wherever possible; however, simple mechanical techniques are favored over computerized components. In all cases, the chosen medium should enhance the message and not overpower or become the main attraction. Designs should show how the message will be conveyed if the interactive device should become temporarily out of service.

16. Exhibits that utilize sound should direct the sound so as not to disturb either visitors observing an adjacent exhibit or the center's staff.

17. All electronic messages should be easily updated or modified at minimal expense.

18. The overall design will include all lighting, sound, special effects, and other electrical or mechanical products or work specified that is not included in the building design plans.

19. Equipment cases, display cases, or any other areas with valuable items should be designed with security in mind and should be lockable.

20. Design of exhibit area should consider traffic-flow patterns, visitor habits, and accessibility in its overall layout. Exhibits should have a logical flow, but should also allow for flexibility

Appendix G - Electronic and Information Technology Accessibility Standards

Audio Description Requirements

ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD
[Published in the Federal Register on December 21, 2000]

36 CFR Part 1194
[Docket No. 2000-01]
RIN 3014-AA25

§ 1194.24 Video and multimedia products.

(c) All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain speech or other audio information necessary for the comprehension of the content, shall be open or closed captioned. (36 CFR Part 1194)

All training and informational video and multimedia presentations that contain speech or other audio information necessary for the comprehension of the content and which support an agency's mission, shall be open or closed captioned regardless of the anticipated audience. This provision would not require that a videotape recorded by a field investigator to document a safety violation be captioned or audio described, for example. On the other hand, if such a videotape were subsequently used as part of a training or informational presentation, it would have to be captioned and audio described. A video of a retirement celebration would not be in support of an agency's mission and thus would not be required to be captioned. Also, this provision applies only to video and multimedia presentations that contain speech or other audio information necessary for the comprehension of the content. A video that is not narrated would not be required to be captioned since it does not contain speech. (Electronic and Information Technology Accessibility Standards—Preamble)

(d) All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain visual information necessary for the comprehension of the content, shall be audio described. (36 CFR Part 1194)

All training and informational video and multimedia productions that support the agency's mission, regardless of format, that contain visual information necessary for the comprehension of the content, shall be audio described. A video or multimedia presentation that does not support an agency's mission would not be required to be audio described. Also, this provision applies only to videos or multimedia presentations that contain visual information necessary for the comprehension of the content. A "talking heads" video does not generally contain visual information necessary for the comprehension of the content and would

therefore not be required to be audio described. (Electronic and Information Technology Accessibility Standards—Preamble)

As the new facility is being developed program development needs will include audio interpretation for the sight impaired, downloadable interpretive information prior to a visit and other similar opportunities.

Appendix H - Evaluation Strategies, Techniques and Best Practices

While evaluation of any program is a critical factor to its ongoing success, it is often the most over looked component. Evaluation of exhibits, programs or any interpretive endeavor provides a venue for restructuring effective program planning and opportunity for growth. Evaluation and monitoring must be conducted regularly to ensure the high quality visitor services indicative of the Forest Service.

Exhibit Evaluation

- The following simple methods should be utilized on an annual basis by unit recreation staff. Exhibits may be evaluated in the planning stage and after completion by using one or a combination of the following methods:
-
- Print draft copies and post on sited or at adjacent visitor centers/offices with a questionnaire or blank sheet for visitors to comment before production.
-
- Evaluate draft exhibits with panel of outsiders not associated with interpretation of subject matter such as local historic group, people with disabilities, and organizations like friends groups, etc.
-
- Observe exhibit readers noting amount of time spent at exhibit.
-
- Evaluated exhibit based upon interaction with various sensory, ability and cognitive levels (For exhibit evaluation guidance, refer to the Wayside Exhibit Evaluation Checklist found at the CDI website: http://www.fs.fed.us/r2//cdi.)
-
- Observe and record visitor interest at exhibit sites by fingerprints, footprints, and cigarette butts. Look for results of depreciate behavior and increase or decrease in vandalism/graffiti, etc.
-
- Solicit visitor comments with questionnaire they fill out.

Evaluation Summary

The bottom line: where problems exist, changes need to be made. If the interpretation is not being read or understood, explore ways to make it better or remove it. If an exhibit is not working, refine and redevelop after gathering public feedback.

National Association for Interpretation Standards and Practices for Interpretive Planning

Additionally, reviewing the Best Practices for Interpretive Planning, as developed by the National Association in Interpretation is useful to evaluate all aspects of an interpretive facility and the programs managed within the facility. The full document can be found at: http://www.interpnet.com/download/BP-Planning-Jan09.pdf. Only portions of that document are included in the table below.

For Audience Analysis	For Planning & Program Evaluation
Best Practice Clearly describe the visitor experience. Consider safety and security issues of both the visitor and the resource. Provide opportunities for visitors to understand and appreciate the resource. Provide opportunities for visitors to connect with the resource both emotionally and intellectually. Enable visitors to make sound decisions and prepare for their experience through consideration of how to provide adequate information, orientation material and maps. The interpretive plan considers that visitors need to get questions answered easily through contact with staff. Provide opportunities for peak experiences and self-actualization. Encourage a commitment from visitor beyond the immediate experience by provoking further thought or action. Be planned holistically to include the decision to visit (promotional materials), the entry (including the journey to the site), the connections that are made through on-site interpretive media and programs, the exit (including the journey home or to another destination), and the commitment on the part of the visitor to change their attitude or behaviors or to support or recommend the site or organization to others.	**Best Practice** New programs and products are developed after an evaluation of existing Interpretive Program and review of visitor interests. A logic model exists in the interpretive plan that identifies measurable outputs, outcomes and impacts. During the planning process, the organization conducts focus groups or other evaluation techniques to get visitor feedback and suggestions about new programs, products or services. During the development stage of new products the organization tests visitor reactions through mock-ups of exhibits and other media. Following implementation of the plan, evaluation of results based on the logic model is conducted within a specified time frame. Plan document should specify methodologies that will be used for future evaluation of existing programs and new ones under development.

For Operational Commitment:	For Visitor Experience
Best Practice The organization does an evaluation of cost for future programs and projects in the planning process and is aware of anticipated cost increases. Operations personnel are involved in development of the interpretive plan.	**Best Practice** Clearly describe the visitor experience. Consider safety and security issues of both the visitor and the resource.
The organization has a detailed cost analysis and/or business plan for any new programs or products that identifies where capital and operating costs will be coming from. The interpretive plan addresses the operational requirements of any new facilities, products or programs developed. Plan should include a schedule for completion of the plan's elements.	Provide opportunities for visitors to understand and appreciate the resource. Provide opportunities for visitors to connect with the resource both emotionally and intellectually. Enable visitors to make sound decisions and prepare for their experience through consideration of how to provide adequate information, orientation material and maps. The interpretive plan considers that visitors need to get questions answered easily through contact with staff.
The plan includes signed commitments from partners if they are essential to the success of the project. Money and resources for development of new interpretive facilities, services, and programs are available before development begins. The interpretive plan is updated or revised as operations issues develop.	Provide opportunities for peak experiences and self-actualization. Encourage a commitment from visitor beyond the immediate experience by provoking further thought or action. Be planned holistically to include the decision to visit (promotional materials), the entry (including the journey to the site), the connections that are made through on-site interpretive media and programs, the exit (including the journey home or to another destination), and the commitment on the part of the visitor to change their attitude or behaviors or to support or recommend the site or organization to others.