NPS Form 10-900 OMB No. 10024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

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This form is for use in nominating or requesting determination for individual properties and districts. See instruction in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name N/A

other names/site number Indian Grove (preferred) / 5SH1035

2. Location

street & number within Great Sand Dunes National Monument (GRSA) [X] not for publication

city or town Mosca [X] vicinity

state Colorado code CO county Saguache code 109 zip code 81146

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this [X] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property [X] meets [ ] does not meet the National Register criteria. I recommend that this property be considered significant [ ] nationally [X] statewide [ ] locally. ([ ] See continuation sheet for additional comments.)

Catherine Slaven 1/14/00

Signature of certifying official/Title Date

National Park Service

State or Federal agency and bureau

In my opinion, the property [ ] meets [ ] does not meet the National Register criteria.
([ ] See continuation sheet for additional comments.)

[signature] State Historic Preservation Officer 12/15/99

Signature of certifying official/Title Date

State Historic Preservation Office, Colorado Historical Society

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is: Signature of the Keeper Date of Action

[V] entered in the National Register
[ ] See continuation sheet.
[ ] determined eligible for the National Register
[ ] See continuation sheet.
[ ] determined not eligible for the National Register.
[ ] removed from the National Register
[ ] other, explain
[ ] See continuation sheet.

for Edson H. Beall 3/24/00

5. Classification

Ownership of Property
(Check as many boxes as apply)

[ ] private
[ ] public-local
[ ] public-State
[X] public-Federal

Category of Property
(Check only one box)

[ ] building(s)
[ ] district
[X] site
[ ] structure
[ ] object

Number of Resources within Property
(Do not count previously listed resources.)

Contributing	Noncontributing	
0	0	buildings
1	0	sites
0	0	structures
0	0	objects
1	0	Total

Name of related multiple property listing.
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of contributing resources previously listed in the National Register.

0

6. Function or Use

Historic Function
(Enter categories from instructions)

SUBSISTENCE/processing

Current Functions
(Enter categories from instructions)

LANDSCAPE/natural feature

7. Description

Architectural Classification
(Enter categories from instructions)

N/A

Materials
(Enter categories from instructions)

foundation N/A
walls N/A
roof N/A
other

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

[X] **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

[ ] **B** Property is associated with the lives of persons significant in our past.

[ ] **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

[X] **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

[ ] **A** owned by a religious institution or used for religious purposes.

[ ] **B** removed from its original location.

[ ] **C** a birthplace or grave.

[ ] **D** a cemetery.

[ ] **E** a reconstructed building, object, or structure.

[ ] **F** a commemorative property.

[ ] **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Archeology: Historic - Aboriginal
Ethnic Heritage: Native American
Social History

Periods of Significance
Ca. 1816-1900

Significant Dates
N/A

Significant Person(s)
(Complete if Criterion B is marked above).
N/A

Cultural Affiliation
Ute

Architect/Builder
N/A

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

[ ] preliminary determination of individual listing (36 CFR 67) has been requested
[ ] previously listed in the National Register
[ ] previously determined eligible by the National Register
[ ] designated a National Historic Landmark
[ ] recorded by Historic American Buildings Survey
#_____
[ ] recorded by Historic American Engineering Record
#_____

Primary location of additional data:

[X] State Historic Preservation Office
[ ] Other State Agency
[X] Federal Agency
[ ] Local Government
[ ] University
[ ] Other

Name of repository:
Colorado Historical Society
Great Sand Dunes National Monument

Indian Grove
Name of Property

Saguache County / CO
County/State

10. Geographical Data

Acreage of Property 38.4

UTM References
(Place additional UTM references on a continuation sheet.)

1. [redacted] Zone [redacted] Easting [redacted] Northing
2. [redacted] Zone [redacted] Easting [redacted] Northing
3. [redacted] Zone [redacted] Easting [redacted] Northing
4. [redacted] Zone [redacted] Easting [redacted] Northing

[X] See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Marilyn Martorano, Manager, Cultural Resources Division
organization Foothill Engineering Consultants, Inc. date 4/9/1999
street & number 350 Indiana Street, Suite 415 telephone 303-278-0622
city or town Golden state CO zip code 80401

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps
A **USGS map** (7.5 or 15 minute series) indicating the property's location.
A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs
Representative **black and white photographs** of the property.

Additional Items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name USDI, National Park Service, Great Sand Dunes National Monument
street & number 11500 State Highway 150 telephone (719) 378-2312
city or town Mosca state CO zip code 81146-9798

DESCRIPTION

Environmental Setting

Indian Grove, 5SH1035, consists of a concentration of 72 culturally peeled ponderosa pine trees located at the Great Sand Dunes National Monument (GRSA) within the San Luis Valley (SLV) of south-central Colorado. The SLV is a high mountain desert receiving only approximately 11 inches of moisture per year. The GRSA is located on the eastern edge of the SLV at the foot of the Sangre de Cristo mountain range. The GRSA contains North America's tallest dunes, covering approximately 39 square miles of area. Indian Grove covers 38.4 acres of land and is located [redacted] A stand of about 200 ponderosa pine trees encompasses the general area surrounding the site. Other vegetation in the area is sparse and consists of low forbs and grasses; the soils are sandy. [redacted] access for Native Americans to and from the Wet Mountain Valley and ultimately to the eastern plains of Colorado. Indian Grove is located in a prime area to support past Native American utilization due to its proximity [redacted] at would have provided ample floral and faunal resources to support a hunting and gathering lifestyle.

Periods of Use

Dendrochronological analysis from a sample of 32 of the cultural scars from Indian Grove indicates that the trees were peeled from approximately 1816 to the early 1900s, with the majority peeled between 1816 and 1846 (Dean 1981). This data suggests that the site was reused over a period of perhaps 100 or more years for the purpose of bark harvesting. The scar dates were determined by comparing tree ring samples removed from the scarred area of the tree to samples from the healthy portion of the tree, and a date calculated for the peeling event. A list of the scar dates is included in the attached table entitled "Summary of Culturally Peeled Trees at Indian Grove."

Ethnicity

Ethnographic and historic data (Martorano 1981), and Native American consultation (Rupert 1996) suggest that the trees were peeled by Native Americans, most likely Ute Indians. This data suggest that the bark was peeled to procure inner or outer bark or bark substances such as pitch or sap. The bark substances could have been utilized for food (both regular and emergency sources); medicinal purposes; as a raw material for constructing objects such as trays, cradleboards, and saddles; as a building material for roofs and walls of structures; and as adhesives and waterproofing agents.

Physical Characteristics

The Indian Grove site type is referred to as culturally peeled trees, sometimes also known as cambium trees or culturally modified trees (CMTs). The scars are found on large, mature ponderosa pine trees. The peeled trees are unique cultural resources because they are living artifacts reflecting cultural utilization of bark. The 72 trees at Indian Grove exhibit 88 culturally-produced scars. A detailed list of the characteristics of the 72 peeled trees at Indian Grove, including tree and scar number; shape, size and date; tree health; and dendrochronological and curation potential are listed in the following table. The scars range from 5 inches to 5 feet in width, and from 4 inches to 9 feet in length. The average-size scar is 17 inches wide and 4 feet long. A study replicating the bark peeling process indicates that approximately one pound of inner bark would have been available from a scar this size (Martorano 1982).

Appearance During Period of Use

The existing landscape setting of Indian Grove is almost pristine. With the exception of the 2-track trail extending through the area, Indian Grove and the surrounding landscape probably appeared in the 19th and early 20th centuries almost exactly as it does today. No modern buildings or other non-contributing obtrusive features (environmental or built) are visible from the site.

Current and Past Impacts

Current threats to Indian Grove include potential natural and cultural impacts. Vandalism is the most likely cultural threat due to the existence of a popular 4-wheel drive trail that extends through the site. Natural threats include disease, insect damage, and other natural causes such as weathering, old age, fire and lightning damage. Since Indian Grove is located within the boundaries of GRSA, the trees are protected from the threat of lumbering operations. A prescribed fire was set in the area in 1996 and has reduced the immediate threat of forest fire damage. GRSA personnel also patrol the area daily in the summer and fall months and approximately twice a month in the winter. Each tree has been permanently marked with a brass marker (with Smithsonian site and tree number) set into cement approximately three feet north of the base of the tree. The markers are used to assist in tracking the condition of each tree. The location of each tree has also been recorded by Global Positioning Systems (GPS). Although the peeled trees are clearly visible from the 2-track road, the only evidence of past vandalism is a few marks cut into the face of one of the scars that is located adjacent to the road. A few of the peeled trees were also apparently logged in the early 1900s, leaving only a stump.

SUMMARY OF CULTURALLY PEELED TREES AT THE INDIAN GROVE

PERMANENT SITE #/TREE #/ SCAR #	ORIGINAL RECORDING NUMBER	SCAR SHAPE *	SCAR SIZE IN *cm.* L X W	SCAR DATE	HEALTH OF TREE	DENDRO. POTENTIAL	CURATION POTENTIAL
5SH1035.2	SD-2	III	147 x 25	1827**	ALIVE	GOOD	GOOD
5SH1035.3	SD-3	III	175 x 58	1822**	ALIVE	GOOD	GOOD
5SH1035.4	SD-4	I	137 x 66	pre-1825	ALIVE	GOOD	EXCELLENT
5SH1035.5	SD-5	III	152 x 37	1816**	ALIVE	GOOD	GOOD
5SH1035.6	SD-6	I	157 x 58	pre-1843	ALIVE	GOOD	GOOD
5SH1035.7	SD-7	III	279 x 23	—	ALIVE	FAIR	FAIR
5SH1035.8	SD-8	I	173 x 31	—	DEAD STANDING	FAIR FOR CROSS SECTION	GOOD
5SH1035.9	SD-9	III	147 x 71	1846**	ALIVE	GOOD	EXCELLENT
5SH1035.10	SD-10	II	180 x 55	pre-1816	ALIVE	GOOD	GOOD
5SH1035.11	SD-11	I	259 x 72	—	ALIVE	GOOD	GOOD
5SH1035.12-1	SD-12-1	III	203 x 55	—	ALIVE	FAIR TO GOOD (DOUBLE TRUNK)	FAIR - GOOD
5SH1035.12-2	SD-12-2	III	202 x 58	—	ALIVE	GOOD	GOOD
5SH1035.13	SD-13	III	108 x 13	1830**	ALIVE	GOOD	GOOD
5SH1035.14	SD-14	I	122 x 78	pre-1837	ALIVE	EXCELLENT	EXCELLENT
5SH1035.15-1	SD-15-1	I	118 x 47	1826**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.15-2	SD-15-2	I	196 x 23	1826**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.16-1	SD-16-1	I	79 x 8	1826**	ALIVE	GOOD	GOOD
5SH1035.16-2	SD-16-2	II	10 x 5	—	ALIVE	GOOD	FAIR, BUT SCAR NOT VISIBLE
5SH1035.17-1	SD-17-1	III	91 x 33	1928**	ALIVE	GOOD	FAIR
5SH1035.17-2	SD-17-2	III	193 x 46	1959 (?)	ALIVE	GOOD	FAIR
5SH1035.18	SD-18	III	140 x 43	pre-1831	ALIVE	EXCELLENT	EXCELLENT
5SH1035.19-1	SD-19-1	III	122 x 27	pre-1857	ALIVE	GOOD	FAIR
5SH1035.19-2	SD-19-2	III	119 x 15	—	ALIVE	GOOD	FAIR
5SH1035.20-1	SD-20-1	III	142 x 29	prob.-1844	ALIVE	GOOD	GOOD
5SH1035.20-2	SD-20-2	I	130 x 10	prob.-1916	ALIVE	FAIR	GOOD
5SH1035.20-3	SD-20-3	I	102 x 25	prob.-1938	ALIVE	FAIR	GOOD
5SH1035.20-4	SD-20-4	III	117 x 13	—	ALIVE	GOOD	GOOD
5SH1035.21-1	SD-21-1	I	122 x 33	1864**	ALIVE	GOOD	GOOD
5SH1035.21-2	SD-21-2	I	183 x 23	1890**	ALIVE	GOOD	GOOD
5SH1035.21-3	SD-21-3	III	102 x 23	—	ALIVE	GOOD	GOOD
5SH1035.22	SD-22	I	173 x 38	—	ALIVE	GOOD	GOOD
5SH1035.23	SD-23	III	117 x 9	—	ALIVE	GOOD	FAIR - GOOD
5SH1035.24-1	SD-24-1	III	15+ x 17	—	DEAD STUMP	FAIR--POOR FOR CROSS SECTION	POOR
5SH1035.24-2	SD-24-2	III	38+ x 27	—	DEAD STUMP	FAIR--POOR FOR CROSS SECTION	POOR

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SUMMARY OF CULTURALLY PEELED TREES AT THE INDIAN GROVE (continued)

PERMANENT SITE #/TREE #/ SCAR #	ORIGINAL RECORDING NUMBER	SCAR SHAPE *	SCAR SIZE IN *cm.* L X W	SCAR DATE	HEALTH OF TREE	DENDRO. POTENTIAL	CURATION POTENTIAL
5SH1035.25	SD-25	III	91 x 39	—	DEAD FALLEN	FAIR--POOR FOR CROSS SECTION	POOR
5SH1035.26-1	SD-26-1	III	91 x 18	1846**	ALIVE	GOOD	GOOD
5SH1035.26-2	SD-26-2	II	152 x 23	1834**	ALIVE	GOOD	GOOD
5SH1035.27	SD-27	III	147 x 38	—	ALIVE	GOOD	GOOD
5SH1035.28	SD-28	I	190 x 79	—	ALIVE	EXCELLENT	EXCELLENT
5SH1035.29	SD-29	UNKNOWN	107 x 81	—	DEAD FALLEN	FAIR--POOR FOR CROSS SECTION	POOR
5SH1035.30	SD-30	III	13 x 8	—	ALIVE	GOOD	GOOD
5SH1035.31	SD-31	III	147 x 41	1824**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.32-1	SD-32-1	I	150 x 71	—	DEAD STANDING	FAIR-POOR FOR CROSS SECTION	FAIR
5SH1035.32-2	SD-32-2	I	76 x 17	—	DEAD STANDING	FAIR-POOR FOR CROSS SECTION	FAIR
5SH1035.33	SD-33	I	56 x 15	—	ALIVE	EXCELLENT	EXCELLENT
5SH1035.34	SD-34	I	89 x 13	—	ALIVE	GOOD	GOOD
5SH1035.35	SD-35	I	110 x 32	1820**	ALIVE	GOOD	GOOD
5SH1035.36	SD-36	I	152 x 145	—	DEAD STANDING	GOOD FOR CROSS SECTION	FAIR
5SH1035.37	SD-37	I	254 x 56	—	ALIVE	POOR	POOR
5SH1035.38	SD-38	I	114 x 15	—	ALIVE	FAIR-GOOD	FAIR
5SH1035.39	SD-39	I	171 x 36	—	DEAD FALLEN	POOR	POOR
5SH1035.40	SD-40	III	145+ x 33	—	DEAD STANDING	POOR	POOR
5SH1035.41	SD-41	IV	152 x 41	1874**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.42	SD-42	I	108 x 13	1815**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.43	SD-43	III	38 x 6	—	ALIVE	GOOD	GOOD
5SH1035.44-1	SD-44-1	I	101 x 20	—	ALIVE	EXCELLENT	EXCELLENT
5SH1035.44-2	SD-44-2	I	208 x 116	1873**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.45	SD-45	III	58 x 1	—	ALIVE	GOOD	GOOD BUT SCAR IS BARELY VISIBLE
5SH1035.46	SD-46	IV	125 x 53	—	DEAD STUMP	NOT POSSIBLE	NOT POSSIBLE
5SH1035.47-1	SD-47-1	I	100 x 55	—	ALIVE	GOOD	GOOD
5SH1035.47-2	SD-47-2	III	150 x 15	—	ALIVE	GOOD	GOOD
5SH1035.47-3	SD-47-3	III	99 x 8	—	ALIVE	GOOD	FAIR
5SH1035.48	SD-48	IV	147 x 66	1826**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.49	SD-49	I	51 x 41	—	ALIVE	POOR	POOR
5SH1035.50	SD-50	III	81 x 48	—	ALIVE	GOOD	FAIR
5SH1035.51	SD-51	IV	84 x 33	1831**	ALIVE	GOOD	GOOD

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SUMMARY OF CULTURALLY PEELED TREES AT THE INDIAN GROVE (continued)

PERMANENT SITE #/TREE #/ SCAR #	ORIGINAL RECORDING NUMBER	SCAR SHAPE *	SCAR SIZE IN *cm.* L X W	SCAR DATE	HEALTH OF TREE	DENDRO. POTENTIAL	CURATION POTENTIAL
5SH1035.52	SD-52	II	203 x 84	—	DEAD FALLEN	FAIR FOR CROSS SECTION	POOR
5SH1035.53	SD-53	I	160 x 71	—	DEAD STANDING	GOOD FOR A CROSS SECTION	FAIR
5SH1035.54	SD-54	I	155 x 86	—	DEAD STUMP & FALLEN	GOOD FOR A CROSS SECTION	POOR
5SH1035.55	SD-55	III	122 x 28	1820**	ALIVE	GOOD	GOOD
5SH1035.56	SD-56	IV	104 x 36	—	ALIVE	EXCELLENT	GOOD
5SH1035.57	SD-57	III	86 x 1	—	ALIVE	EXCELLENT	GOOD
5SH1035.58	SD-58	IV	145 x 64	—	DEAD FALLEN	GOOD FOR A CROSS SECTION	POOR
5SH1035.59	SD-59	III	169 x 51	1821**	ALIVE	EXCELLENT	EXCELLENT
5SH1035.60	SD-30	III	71 x 28	—	ALIVE	EXCELLENT	EXCELLENT
5SH1035.61	SD-61	II	163 x 61	—	DEAD STANDING	GOOD FOR A CROSS SECTION	FAIR
5SH1035.62	SD-62	I	145 x 38	—	DEAD STANDING	GOOD FOR A CROSS SECTION	FAIR
5SH1035.63	SD-63	I	150 x 122	—	DEAD STANDING	GOOD FOR A CROSS SECTION	FAIR
5SH1035.64	SD-64	I	94 x 33	—	DEAD FALLEN	FAIR FOR A CROSS SECTION	POOR
5SH1035.100	SD-100	UNKNOWN	Unk. x 74	—	DEAD STUMP	NOT POSSIBLE	POOR
5SH1035.101	SD-101	III ?	149 x 84	—	DEAD FALLEN	FAIR TO POOR FOR A CROSS SECTION	POOR
5SH1035.102	SD-102	UNKNOWN	76 x <2	—	ALIVE	GOOD	GOOD BUT SCAR IS NOT VISIBLE
5SH1035.103	SD-103	UNKNOWN	Unk. x 64	—	DEAD STUMP	POOR	POOR
5SH1035.104	SD-104	UNKNOWN	97 x 94	—	DEAD STUMP & FALLEN TOP	FAIR FOR A CROSS SECTION	POOR
5SH1035.106	SD-106	IV ?	152 x 64	—	DEAD FALLEN	POOR FOR A CROSS SECTION	POOR
5SH1035.107	SD-107	IV ?	147 x 76	—	DEAD FALLEN	NOT POSSIBLE	NOT POSSIBLE
5SH1035.108	SD-108	III ?	124 x 43	—	ALIVE	GOOD	GOOD
5SH1035.109	SD-109	III	107 x 10	—	ALIVE	GOOD	GOOD

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Previous Investigations

1978-1981 Thesis research by Marilyn A. Martorano. M.A. thesis, Department of Anthropology, Colorado State University, is entitled "Scarred Ponderosa Pine Trees Reflecting Cultural Utilization of Bark" (Martorano 1981). Work included initial recording of the majority of the peeled trees within site 5SH1035 and dendrochronological analysis.

1988 Survey and recording of peeled trees by Goodson & Associates, Inc. (Marilyn A. Martorano and David G. Killam) assisted by members of the San Luis Valley Chapter of the Colorado Archaeological Society (Martorano 1989). Work included documentation of 11 additional peeled trees within site 5SH1035.

1994 Completion of the inventory and documentation of culturally peeled trees at GRSA (Martorano 1995). Work included permanent datum placement at each tree, Global Positioning System (GPS) locational data recording, site boundary determination, evaluation of the site for the National Register of Historic Places (NRHP), and recommendations for long-term preservation and management of the peeled trees.

1996 Native American consultation with the Northern and Southern Utes regarding culturally peeled Trees at the Great Sand Dunes National Monument documented by Dave Rupert, National Park Service. Manuscript on file at NPS, Colorado Plateau SSO, Denver, CO.

SIGNIFICANCE

Indian Grove is eligible for the National Register under criterion D for its information potential regarding historic aboriginal archaeology. The site has yielded and can continue to yield important information on Native American (specifically Ute) social history and subsistence strategies. Indian Grove is associated with the post-contact to reservation period context of Native American history of Colorado. Little is known about the details of the lifeways of Utes during the 19th and early 20th centuries and very few definite Ute sites have been identified in Colorado (Nickens 1989). Indian Grove is significant at the state level. Less than 400 culturally peeled trees have been documented in Colorado, and Indian Grove contains one of the two largest concentrations of culturally peeled trees in the state. The other large concentration, the Agency Knob site (5SH1716), contains 137 peeled trees, has only five dated scars, and the harvesting pattern has not yet been determined (Pfertsh 1996:75, 79). The Indian Grove site contains a large variety of sizes and shapes of scars, and the 32 dated scars indicate probable reuse of the site for over 100 years. This comprehensive data is not available from any other known culturally peeled tree site in Colorado. The baseline data for most of our current knowledge of this site type is based on the information previously collected from Indian Grove--i.e., it is considered the definitive site type example. Indian Grove is also eligible under criterion A for its ability to convey aspects of social history and ethnic heritage, notably subsistence practices of Ute Indians during the post-contact to reservation period in Colorado. This site is directly associated with the broad patterns of Native American history.

Cultural Context

Ponderosa pine trees with large oval or rectangular scars on their trunks are found in many locations throughout Colorado and the Western United States. Examination of the scars indicates that they were not produced by animals, lightning, fire or other natural causes. These peeled ponderosa pine trees are considered to be living artifacts reflecting cultural utilization of bark.

Scars resulting from human peeling of trees for the purpose of bark utilization can be distinguished from other types of natural and cultural scars. Lightning scars are usually long and thin, often extend along the entire length of the tree, and sometimes spiral around the tree trunk. Fires can also cause scarring, but this type of scar usually begins at the base of the tree and is triangular in shape with the widest edge along the bottom. Fire scars are often found on the uphill side of trees on slopes. Many of the culturally peeled trees exhibit evidence of burning because the lack of outer bark and the pitch on the scar surface makes the tree vulnerable to ground fires. Several species of animals, such as porcupine, bear, elk, and deer produce scars on trees, but these scars are usually irregular in shape and patchy; and teeth, claw or antler marks are often visible on the scar surface. Trail blazes are human-produced, but are usually small strips and/or patches cut out with an ax. They often occur on two sides of a tree along a trail or road. A survey or witness tree is also culturally-produced, but it usually exhibits a rounded or rectangular-shaped scarred area with numbers, dates or other information carved into it.

The scars of trees peeled for cultural use of bark substances vary in size and shape, but have several distinguishing features. They are usually oval or rectangular in shape with one or more points at either end. Often, the lower scar edge is horizontal and the upper end may come to one or more points. This would confirm that an initial horizontal cut was made into the bark and the strips were then pulled off in an upward motion. The bottom of the scar is usually above ground and begins at 1-3 feet high. The top of the scar can extend to over ten feet above the ground. Many of the scars exhibit cut lines which are visible across the lower end of the scar. These cuts are sometime very even straight lines, approximately 3-4 inches in length, suggesting they are the result of ax cuts. Other cut marks are jagged which would indicate perhaps the cutting was done with a sharpened stone rather than a metal tool. The width and length of the scars are quite variable.

In order to examine cultural utilization of ponderosa pine tree bark, the biological structure of the bark must be understood. On the outside of the tree is the actual bark. A specialized tissue found only on woody plants, bark serves mainly to stop water loss from the layers that lie beneath it. Bark also shields the tree from casual injury and from temporary extremes of heat or cold. Just inside the bark is a layer of cells called the phloem, which transports the food reserves manufactured by the tree. Inside of the phloem is a layer, one-cell thick, called the cambium, which is responsible for producing the phloem to the outside and the xylem (or wood) to the inside. In the spring, when the tree begins an active growth period, the cambium starts to divide to produce the new cells for the phloem and xylem. At this time, there is a zone of immature cells (which have not yet differentiated) between the phloem and xylem. Because these cells are immature and soft-walled, the bond between the wood and bark is weak, making removal of the bark easiest at this time of the year. When the outer bark is removed, the new phloem cells come off with the bark. It is really the phloem, which is rich in proteins and carbohydrates, that is the nutritious part of the bark. This phloem layer, which can be separated from the outer bark, is probably what is referred to in most ethnographical references as inner bark, or cambium, and has been used as a food source. Nutritional analysis of ponderosa pine inner bark has shown that it contains significant amounts of calcium, carbohydrates, iron, magnesium, zinc, and other nutritional substances.

Tree bark and bark substances were utilized aboriginally for a variety of functions. The inner bark of many varieties of pine has been used by Native Americans for food in cases of impending starvation and for medicinal purposes. The bark was often prepared for eating by thoroughly pounding it. The outer bark was utilized as a building material (e.g., for roofs and walls of structures) and to construct objects (i.e., trays, baskets and cradleboards). Resins and pitch from the peeled areas of trees were also utilized as adhesives and as waterproofing agents for basketry and other objects.

At times, all groups of Utes reportedly ate bark substances. They were known to have eaten sap from aspen trees as a delicacy and the Northern Utes also reportedly tied small strips of the inner bark of pine trees into bundles and ate them with salt (Smith 1974:65-67). It is hypothesized that because bark was already know to the Utes as an edible resource, resorting to bark as an emergency food in times of starvation would have been a logical occurrence. The Utes reportedly utilized the inner bark of ponderosa pine to thicken meat soups and to make a tea and tonic. They also were reported to have

striped the bark of ponderosa pine trees to bleed the pitch or sap for waterproofing baskets. The most detailed description of inner bark utilization and procurement methods based on information from native informants is a paper by Thain White (1954) entitled "Scarred Trees in Western Montana." White's information was collected from Kutenai informants who remembered how the inner bark was harvested. According to his informants, the tree peeling process took place as follows: 1) a tree was selected for peeling; 2) bark from a vertical notch six to eight inches long was removed from the tree and the inner bark was eaten; 3) if it was considered "good," an area was selected for removing a larger section of bark and a horizontal cut was made through the outer bark with an ax; 4) a sharpened branch or pole called a "debarking stick" was inserted under the cut and used to loosen and pry the outer bark from the tree with an upward motion. The strips of outer bark were also sometimes stripped downward from the trunk as well as upward, resulting in one or more points at both ends of the scar. The inner bark was then removed from the outer bark slabs with a scraper. The scraping of the inner bark was completed in the vicinity of the stripped trees because the slabs of outer bark were too bulky and heavy to be taken back to camp. Once removed from the outer bark, the inner bark strips were then prepared for storage or consumption. They could be cut into small strips and rolled into balls or tied into knots and packed in green leaves to prevent drying out. The trees were peeled in the spring, usually in May, when the sap in the tree was running and the bark was easiest to remove. (Inner bark utilization in this case was apparently a seasonal event and not an emergency measure.)

Kinds of Potential Information

Under National Register Criterion D, Indian Grove has yielded significant information about historic aboriginal archeology and Native American (Ute Indian) social history during the 1816-1900 period of significance. This data includes information on subsistence patterns of the Ute Indians during the post-contact to reservation period in the SLV and Colorado. The information already gathered has provided specific chronological data (through tree ring analysis) regarding Native American utilization of the area. Other subsistence data regarding use of the trees for food, medicine, etc. has also been obtained.

Under National Register Criterion D, Indian Grove is also likely to provide additional significant information about historic aboriginal archeology and Native American (Ute Indian) social history. Further study of the peeled trees at Indian Grove will help to provide data regarding periods of use and general subsistence data, and will also answer additional research questions regarding seasonality of use, reasons for the peeling (especially regarding different sizes of scars and use patterns), migrations and seasonal rounds of Native populations, effects of environmental and sociological stress on human populations in general and specifically during the 19th century, and cultural adaptation. These questions can be addressed through the following:

- More detailed analysis and comparison of the physical attributes of the scars and studying the cut marks on the scars to determine the types of tools and peeling methods utilized during the bark removal process.

- Obtaining additional scar dates through dendrochronological analysis to provide a larger sample of dates that may provide data for more comprehensive interpretation of use of the area over time. For example, scar size could be compared to dates of the peeling events; dates of the scars compared to known environmental conditions such as periods of drought; and the scar dates compared to known significant historical events in the area.

- Conducting additional Native American consultation with Utes and other groups to learn more about traditional practices regarding tree peeling and bark procurement. Questions regarding gender of the tree peelers may also be addressed.

- Conducting additional nutritional analysis of the inner bark and sap to determine other potential nutrient values (e.g., vitamin content, etc.) of bark and bark substances.

- Excavating around the base of selected peeled trees to obtain information about the actual tree peeling process and other associated activities that may have been occurring on-site (Duke and Charles 1992; Duke 1997).

Research Potential

Under Criterion D, Indian Grove has potential to yield data on Native American (Ute) subsistence practices; historic Native American health and medicinal practices; social history and the relationship to environmental change and adaptation during the post-contact to reservation period. Specific research questions relevant to these areas of significance at Indian Grove include the following:

- Were the trees peeled as emergency measures or as part of regular seasonal subsistence strategy or did both types of use occur?

- Did patterns of bark utilization change over time due to environmental and/or population stresses? For example, did the sizes of the scars increase when the bark was utilized as an emergency source of food?

- Were certain trees selected for peeling because of differences in taste, smell, or ease in bark removal? Were inner bark substances utilized most often in specific locations such as near campsites, trails, or mountain passes?

- Why were certain trees peeled up to three or four separate times while other nearby trees of similar size and age were not utilized?

- Are variations in scar morphology based on differences in intended uses of the bark?

- Can the specific cultural affiliation and gender of the tree peelers be identified based on scar characteristics, dates of the peeling event, location of the tree, etc.? Is it possible that Spanish or other non-native populations were peeling trees at Indian Grove?

- Can the tools utilized in the debarking process be identified by the cut lines or other marks remaining on the scar?

- How did bark peeling fit into seasonal subsistence patterns, and can locations of peeled trees be utilized to hypothesize seasonal movement during the Protohistoric/Historic Period?

- Can the distribution of culturally peeled trees be compared to scar dates to hypothesize seasonal movements and migrations of specific cultural groups such as the Utes?

- Are there regional differences in the peeling of ponderosa pine trees (dates of utilization, reasons for peeling, methods of peeling, cultural affiliation/gender of the peelers, etc.)?

- Dendrochronological analysis of a sample of the trees suggest that the bark harvesting at Indian Grove occurred from as early as 1816 to as recently as the early 1900s. What is the actual time span for bark peeling of ponderosa pine trees within Indian Grove, and how does that compare to use of bark substances in other surrounding areas (Southwest, Great Basin, Northern Rocky Mountains, etc.)?

Site Integrity and Significance

Integrity of the site in general is good because it appears that the majority of the trees originally peeled at the site are extant. The integrity of the majority of the trees (about 94%) is good for obtaining additional descriptive data regarding the scar characteristics. All of the trees have good potential for excavation to be conducted around the base of the trees. Approximately 32 (36%) of the scars have been dated through dendrochronological analysis, and 41 of the additional scars (47%) have potential to be dated through dendrochronological analysis using increment borings or cross-sections. Dating these additional trees would more than double the dated culturally peeled trees in Colorado, and would assist in addressing many of the research questions.

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