Appendix C. Plants

Precontact History and Cultural Legacy of Forest Research Sites in Southwestern Oregon

This appendix lists, categorizes, and describes cultural uses of native plants by precontact and early historical Indian people of southwest Oregon, including the China Gulch, Humbug, and Shoestring forest research areas. This is not a comprehensive listing, but a beginning step toward an educational website in that direction.

The appendix is arranged in three parts, in various phases of development:

1. Cultural Plants: Indicator Species. Important plants and their uses throughout southwest Oregon. "Indicator species" is an arbitrary designation recognizing the widespread use of certain prized plants, and as the current presence of these plants in the environment "indicates" the potential for past cultural activities in the area.

Table 1. Key Indicator Species: Select Cultural Plants Used and Valued by Historical Dakubetede and Cow Creek Athapaskans

2. Landscape Patterns: Cultural Aspects. Cultural landscape patterns are discussed in greater degree in the body of the report, but additional materials are included with this appendix. Tabular and visual patterns are documented by species and area.

Table 2. Cultural Plant Patterns: "Indicator Species" types, uses & landscape patterns; selected and arranged by type

www.ORWW.org/History/SW_Oregon/References/Walling_1884/Illustrations/index.html

3. Documented Indian Burning Practices. Eyewitness accounts and informed observations of the use of fire in southwest Oregon landscape management practices, by local precontact and early historical Indian families and communities.

1. Cultural Plants: Indicator Species. Most native vascular plants of Southwest Oregon were used by precontact people for a wide variety of purposes; principally for food, weaving and construction fibers, and fuel. Other uses included medicines, dyes, art, recreation, bedding, and virtually any other purpose for which plants can be used by people.

The following list of "indicator" plant species have been selected because of their well-known and prized status by local precontact cultures, and because their presence in the environment can be indicative of past land management processes. This list is not intended to be comprehensive or exhaustive, but rather representative of the types and species of plants most often associated with local (and regional) human use and occupation.

This table includes columns for general uses of each species, and their general formation across the landscape. The following pages include specific ethnographic references to these plants, and others, and how fire was used to affect their presence and structure in the landscape.

Table 1. Key Indicator Species: Select Cultural Plants Used and Valued by Historical Dakubetede and Cow Creek Athapaskans

Local Name	Type	Scientific Name	Uses	Pattern
Beargrass	Bulb	*Xerophyllum tenax*	Fiber, Food	Patches
Black Oak	Deciduous		Acorns, Fuel	Orchards
Blackberry	Berry		Fruit, Dye	Patches
Blue Wildrye	Grass	*Elymus glaucus*	Food, Fiber, Fuel	Fields
Bracken	Fern		Food, Fiber, Fuel	Prairies
Camas	Bulb		Food	Fields
Cat-tail	Perennial		Food, Fiber, Fuel	Patches
Flags	Perennial	*Iris tenax*	Fiber	Patches
Hazel	Shrub		Nuts, Fiber, Fuel	Patches
Huckleberry	Berry		Fruit, Dye	Fields
Manzanita	Shrub		Fruit, Fuel	Fields
Ponderosa Pine	Conifer		Nuts, Pitch, Fuel	Stands
Sadler Oak	Deciduous		Acorns	Fields
Sugar Pine	Conifer		Nuts, Bark, Pitch	Groves
Sunflower	Annual		Food	Patches
Tarweed	Annual	*Madia elegans*	Food	Fields

Beargrass

"leaving the river, we ascended a long spur of mountain to the top of the dividing ridge between it and Redwood Creek, through alternate forest and prairie land . . . prairies of rich grass *(Xerophyllum tenax)* lie on their southern slopes . . . The Indians (**Chilula** in northern California) used the stalks in their finer basketwork . . . late in the season, however, the grass is often burned, and dependence cannot always be placed on the usual grounds (for animal feed)" (McKee and Gibbs, quoted in Schoolcraft 1853, Vol. 3: 133, and by Pullen 1996, App. III: 24).

Black Oak

Of the oaks there is a great variety; several of them evergreens, including the chestnuts [chinquapin] and live-oaks. The acorns, bay-nuts [myrtle nuts], and pinones, or nuts of the edible pine, all contribute to the subsistence of the Indians, who use them in various forms, roasted whole, or pounded into flour, and made into bread or porridge. Piles of the husks are to be seen round every lodge" (McKee and Gibbs, quoted in Schoolcraft 1853, Vol. 3: 133, and by Pullen 1996, App. III: 24).

"The staple food of the ***Takelma*** is probably to be considered the acorn (***yana***), of which there were several recognized varieties, the black acorn (***yana yahal***) being considered the chief. The first acorns appeared in the early spring, at which time they were gathered and prepared by the women . . ." (Sapir 1907: 258, quoted by Pullen 1996, App. I: 30).

"All the oak timber was owned by well-to-do families and was divided off by lines and boundaries as carefully as the whites have got it surveyed today. It can be easily seen by this that the Indians have carefully preserved the oak timber and have never at any time destroyed it.

The Douglas fir timber they say has always encroached on the open prairies and crowded out the other timber; therefore they have continuously burned it and have done all they could to keep it from covering the open lands. Our legends tell when they arrived in the Klamath River country that there were thousands of acres of prairie lands, and with all the burning that they could do the country has been growing up to timber more and more." --Che-na-wah Weitch-ah-wah (Thompson 1991: 33)

Blue Wildrye

"*Elymus glaucus*, Western Rye Grass, **Karok purukuri**. This yields edible seeds, which are parched in a basket with hot coals and punded into flour. Rthe flour is mixed with water and eaten as a paste." (Schenk and Gifford 1952, Karok Ethnobotany: 381, quoted in Pullen 1996, App. I: 36).

Camas

"The principal root used was the *camas*, great quantities of which were collected and dried during summer and stored for the coming winter's provision. This is a bulbous root much like an onion, and is familiar to nearly every old resident of Oregon." (Walling 1885: 180).

March 13, 1827. "This day we passed over three small plains well stock'd with Camass Roots in one of them we saw several men and Women employed in drying roots . . . " (Ogden cited in LaLande 1987: 2, quoted by Pullen 1996, App. III: 7).

Cat-tails

Cat-tail rushes were used in **Takelma** homes as bedding, spread about the fire (Pullen 1996, App. I: 8).

Flags

"The deer was the principal game, which, before they had guns, were taken with snares. To capture a deer in this manner they must have ropes and good ones. These were made from the fibre taken from a plant – a kind of flag – growing in the mountains. From each edge of the long flat leaves of the flag a fine thread of fibre was obtained by the squaws, stripping it with their thumb nails. This was a slow process and would require the labor of one squaw a year to make a rope five-eights of an inch thick and fifteen feet long, but the rope was a good one and highly prized by its owner . . . I remember at one time a great antlered buck came across the field with a rope around his neck with a piece of root on the end. The deer in plunging through the brush at the river's edge entangled the rope and being in swimming water was unable to pull loose. An Indian soon came running on the track and was greatly pleased at the capture of the buck and recovery of his valuable snare rope." (Riddle 1953: 43-44).

"Net twine made of iris fibers. **Temele.** Fiber extracted by splitting leaf with teeth. Fibers spun by rolling on thigh. Gathering iris, spinning, and net making all men's work. Informant didn't know how nets were made because work was carried out in sweathouse from which women and children barred." (Cora DuBois, 1934 Tututni Field Notes: Notebook 6, Bancroft Collection, quoted in Pullen 1996, App. I: 23).

Hazel

" Hazel Nuts (**Suthxale**) – In about the middle of the summer, the headman of the village had to burn off the brush. All the hazel nuts fell off and the people went out to pick them up. The nuts are roasted by the burning of the brush. They are whipped with a stick in the basket in which they have been collected. This husks them. The nuts are then picked out by hand." (Cora DuBois, 1934, Tutuni Field Notes, Notebook 6, Bancroft Library Manuscripts Collection, quoted in Pullen 1996, App. I: 32).

"Their supper consisted of fresh salmon, and a species of hazel-nut, which is found in the country in great abundance. Having made a suitable fire, they commenced the operation of cooking their salmon . . . Stones were then provided for the purpose of cracking nuts, and all being seated on the ground, the eating process commenced. The extreme novelty of their appearance, the nut cracking, the general merriment, the apparent jokes, ready repartee, and burst of laughter, were sufficient to have excited the risibilities of even a Roman Catholic priest, however phlegmatic." (Gustavus Hines, 1850 A Voyage Round the World: 102, quoted in Pullen 1996, App. I: 32).

Manzanita

"A favorite food was the manzanita berry (**loxom**). These were pounded into a flour (**pabap**), mixed with sugar-pine nuts (**tgal**), and put away for future use; they were consumed with water." (Sapir 1907: 258, quoted in Pullen 1996, App. I: 34).

"Berries and nuts were in abundance. Manzanita-berries (Arctostaphylos Manzanita Parry) grew in great quantities and were used to make the well-known 'manzanita-cider' . . . Manzanita-berries were crushed, and used to make manzanita-cider in a manner similar to that described among the **Maidu**. The winnowed meal was also mixed with the acorn-meal in making a special variety of acorn-soup." (Dixon 1907: 424, 426, quoted in Pullen 1996, App. I: 34).

[Author's Note: The following brief paper was received as an attachment via email from Frank Lake, in kind response to a request regarding this report. Several sentences are cited in the main report. Here it is included in its entirety. Minor typos have been corrected, and formatting has been changed slightly, but the document is otherwise unchanged.]

Tribal use and management of Manzanita dominated habitats in the Klamath-Siskiyou region:

Compiled by Frank K. Lake, USFS-PSW , February 7, 2007.

Post fire vegetation response:

Natural lightning ignition started fires occurring in the mid to late summer were likely stand replacing moderate to high severity events which top kill manzanitas (Agee 1993:288 see repeat photo for Applegate valley in southwestern Oregon). Human ignited fires can be prescribed at other seasons under other conditions to reduce fire intensity. "The manzanita, another one [that] does not come up, when it is burned off. An old tree bears better, too" (Harrington 1932:63-65 in Lewis 1993:88). Lewis (1993) comments further about the spotty or patch burning of chaparral when referring to the descriptive statements about Karuk burning from a Karuk female consultant of Harrington (1932). Although, Native American use of fire killed manzanita as fuel heating and cooking relied upon stand replacement events at finer scales within the distribution of manazanita. The management of a critical fuel wood, such as manzanita, with fire would need to balance consumptive use (harvesting and energy to needed to harvest and pack fuel back to the village or camp sites) with the productive of the manzanita (how much biomass can grow at a given site over time). Among the Karuk, Yurok and Hupa dead dry manzanita was used as sweathouse heating wood, this practice may have not been shared with the all of the culturally similar tribes to the north. Gray (1987:37) reported that the Takelma used fire outside of the sweathouse structure to heat rocks which were then brought into the sweathouse for steaming and cleansing, then on page 55 for the Galice describes the use of the men's sweathouse in manner consistent with northwestern California tribes. "To heat the sweathouse, the Galice collected and bundled little sticks of hardwood which they then burned in a round pit" in the sweathouse (Gray 1987:55). The collection and harvesting of fuel wood still would have been necessary for heating or cooking. The density of Manzanita makes it a superior fuel wood compared to other wood material.

Most of the vegetative regrowth associated with post fire manzanita habitat was culturally significant foods (bulbs and spring greens). Most top killed dead manzanita and oaks were harvested for fire/sweathouse wood which promoted wildlife browsing access to resprouts and reduced new fuel accumulation in the short term while the food plants could be accessible without fighting/struggling through the dead branches because those were hauled away for fuel. Prior to burning "mature and old growth" manzanita produced berries which were an important food. The fruit's powdery meal used for tea/cider. The bark was also used for medicine (skin rashes/injury, astringent) (Davis and Hendryx 1991). The nuts were used for regalia/beads. See the Lost Creek dam and Applegate Dam archeological surveys of the Native American house floors in Pullen (1996) for manzanita. Manzanita seeds were a dominant component, leading the archeologists to think manzanitas were important to the pre-contact subsistence landuse/diet. For the Karuk in Northwestern California Green Manzanita (*Arctostaphylos patula*) was used: "Manzanita wood was used in most Karuk ceremonial fires and was gathered along the Salmon River since the shrub does not grow in abundance near Somes Bar" (Davis and Hendryx 1991:129). The wood of various manzanitas were also used for implements by the Karuk (Schenenck and Gifford 1952). Baker (1981) reported that manazanita berries were used as food for A. canescens, A. cinerea, A. nevadensis, A. patula, and A. uva-ursi, and among the Tolowa, Yurok and Karuk. No specific references to White Leaf manzanita (A. viscida) use by Native Americans for southwest Oregon or northwest California were found in the references provided. A web based "google" search of the ethnobotanical uses of White leaf manzanita discusses the primary uses as food (berries) for tribes in California (USDA GRIN).

The overall cultural Native American precontact landuse pattern I would suggest existed was: Fire used to burn chaparral manzanita dominated patches every 20-30 years which fostered the exclusion of dominant conifer (Douglas fir) establishment (see Agee 1991 example abobe, subsequent harvesting of dead manzanita tops for fuel, released and promoted the Indian potatoes (cat ears, blue dicks, etc.) to flower which increased population level needs after being dormant for a couple decades (Anderson 2005),

fostered spring greens such as minor's lettuce, Latuca sp./wild lettuce, and sunflower types to sprout (greens), flower and seed (ground meal/flour), and then the 1-10 years following the burn the area was a wildlife feed lot, attracting deer, birds, fur bearers, etc. in the years after the burn (Lake un published tribal oral histories). Then as the manzanita resprouted or seed bank germinates matured, the area, due to it's patchy (fire induced landscape pattern) would be cover habitat for rearing and nesting of wildlife such as deer and birds. This vegetation type is low-mid elevation (south aspect) adjacent to many other fire-affected vegetation communities, such as riparian (low lands), mixed-conifer (north aspect, mid elevation) and oak woodland/savanna gradations in aspect and harsher soil types.

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USDA Germplasm Resources Information Network web link:
http://herb.umd.umich.edu/herb/search.pl?searchstring=Arctostaphylos%20viscida&searchlimit=100

Ponderosa Pine

Leiberg (p. 290-291) The custom of the Indians of peeling the yellow pine at certain seasons of the year to obtain the cambium layer which they use for food, is in some localities a fruitful contributory cause toward destruction of the yellow pine by fire. They do not carry the peeling process far enough to girdle the tree, but they remove a large enough piece of bark to make a gaping wound which never heals over and which furnishes an excellent entrance for fire. Throughout the forests of the Klamath reservation trees barked in this manner are very common. Along the eastern margin of Klamath marsh they are found by the thousands.

Sadler Oak

"The most desirable acorns came from the Sadler oak, sometimes known as the sweet oak. This scrubby, low growth oak, normally under eight feet in height, was found throughout the Siskiyous and Coast ranges. It was usually a dependable and heavy producer of nuts and its acorns were mild in their content of bitter, tannic acid, compared to the more widespread Black Oak." (Booth 1971: 5, quoted by Pullen 1996, App. I: 31).

Sugar Pine

Sugar pine boards were used to build "typical" **Takelma** homes (Pullen 1996, App. I: 8) . . . The **Takelma** burned the bases of sugar pine trees in the fall to obtain the sap, which was used as a source of sugar (Boyd 1986: 73). When the **Tututni** were gathering sugar pine cones in the fall, they built a fire to burn the pitch from the cones, and to cause the cones to open so the seeds could be collected (DuBois 1934: Notebook 6, quoted in Pullen 1996, App. V: 6).

September 25, 1841. "The Pinus Lambertiana was more common; the trees of this species are not beyond the usual size of the pine tribe, but their cones were seen fifteen inches in length. Some of the sugar produced by this tree was obtained; it is of a sweet taste, with a slightly bitter and piny flavour; it resembles manna, and is obtained by the Indians by burning a cavity in the tree, whence it exudes. It is gathered in large quantities. The sugar is a powerful cathartic and affected all the party who partook of it; yet it is said that it is used as a substitute for sugar among the trappers and hunters" (Wilkes 1845: 122).

Tarweed

"Especially abundant in Applegate Valley" (see: *LaLande 1995: 57)

"Indian-oats. They burn a patch of wild-oats to gather the seeds – the seeds do not burn. These oat patches belonged to tribe or village – a stranger would not touch them. The burned 'meat' was black." (Coquille Thompson, informant for John Harrington, Reel 25, Frame 249, quoted by Pullen 1996, App. I: 35).

"During the summer months the squaws would gather various kinds of seeds of which the tarweed seed was the most prized. The tarweed was a plant about thirty inches high and was very abundant on the bench lands of the [Cow Creek] valley, and was a great nuisance at maturity. It would be covered with globules of clear tarry substance that would coat the head and legs of stock as if they had been coated with tar. When the seeds were ripe the country was burned off. This left the plant standing with the tar burned off and the seeds left in the pods. Immediately after the fire there would be an army of squaws armed with an implement made of twigs shaped like a tennis racket. With their basket swung in front, they would beat the pods into the basket. This seed gathering would only last a few days and every squaw in the tribe seemed to do her level best to make all the noise she could, beating her racket against the top of her basket (Riddle 1923: 46).

2. Landscape Patterns: Cultural Aspects. Landscape-scale patterns (visual areas of hundreds and thousands of acres) are cultural in nature when the physical aspects of the pattern are human in origin. This concept is described in greater detail in the main text (see Part 6: pg. 13). When visible patterns of vegetation are described at a landscape-scale, a number of terms can be used that are consistently defined through both time and disciplines. Terms such as: fields, groves, meadows, patches, prairies, and stands can be used to interpret polygons, colors, and textures found on maps, aerial photographs, and panoramic viewpoints. Table 2 provides some examples of the types of growing conditions that the "indicator species" chosen for Table 1 might be expected to be found in:

Table 2. Cultural Plant Patterns: "Indicator Species" types, uses & landscape patterns; selected and arranged by type

Local Name	Type	Scientific Name	Uses	Pattern
Sunflower	Annual		Food	Patches
Tarweed	Annual	*Madia elegans*	Food	Fields
Blackberry	Berry		Fruit, Dye	Patches
Huckleberry	Berry		Fruit, Dye	Fields
Beargrass	Bulb	*Xerophyllum tenax*	Fiber, Food	Patches
Camas	Bulb		Food	Fields
Ponderosa Pine	Conifer		Nuts, Pitch, Fuel	Stands
Sugar Pine	Conifer		Nuts, Bark, Pitch	Groves
Black Oak	Deciduous		Acorns, Fuel	Orchards
Sadler Oak	Deciduous		Acorns	Fields
Bracken	Fern		Food, Fiber, Fuel	Prairies
Blue Wildrye	Grass	*Elymus glaucus*	Food, Fiber, Fuel	Fields
Cat-tail	Perennial		Food, Fiber, Fuel	Patches
Flags	Perennial	*Iris tenax*	Fiber	Patches
Hazel	Shrub		Nuts, Fiber, Fuel	Patches
Manzanita	Shrub		Fruit, Fuel	Fields

Visual vegetation patterns as components of cultural landscape van be shown with photographs and drawings; and also used to interpret earlier patterns and possible future changes. See:

www.ORWW.org/History/SW_Oregon/References/Walling_1884/Illustrations/index.html

Southern vs. northern slope plant associations

June 29, 1846. "On the morning of June 29th, we passed over a low range of hills, from the summit of which we had a splendid view of Rogue river valley. It seemed like a great meadow, interspersed with groves of oaks which appeared like vast orchards. All day long we traveled over rich black soil covered with rank grass, clover and peavine . . ." (Lindsay Applegate, quoted in Walling 1885: 304).

Grassy ridgelines

"Any one who frequents the mountains of the north will soon notice that on all the hill-sides facing the sun there is no undergrowth. You may ride there, provided you do not wedge in between the trees that grow too close together to let you pass, or go under a hanging bough, the same as in a park. But if you get on the north side of the hill, you find an undergrowth that is almost impassable for man or beast. Chapparral, manzanita, madrono, plum, white thorn, and many other kinds of shrubs and trees, contribute to make a perfectly safe retreat from men for the wild beast of those regions." (Joaquin Miller 1873, Life Among the Modocs: 179, quoted in Pullen 1996, App. III: 23).

Foods: types, species, and general locations

"The Indians gathered a great variety of roots, berries, and seeds, which they made use of for food . . . There were several varieties of grass seeds, the huckle-berry, black-berry, salmon-berry, squaw-berry, manzanita-berry and perhaps others, which entered into the diet of the Indian generally, or as governed by the locality in which they grew . . . The women, as is invariably the case among North American Indians, performed all the work of gathering these combustibles and of preparing them likewise." (Walling 1885: 180-181).

"'Bread is made of acorns ground to flour in a stone mortar with a heavy stone pestle, and baked in the ashes. Acorn flour is the principal ingredient, but berries of various kinds are usually mixed in, and frequently seasoned with some high-flavored herb. A sort of pudding is also made in the same manner, but it is boiled instead of baked.'" (Walling 1885: 180, quoting Bancroft).

Fibers

"The Indian women ingeniously plaited grass, *tule* or fine willow roots into baskets, mats, etc. The baskets constructed for cooking purposes would retain water and were even used as kettles for boiling that fluid." (Walling 1885: 181).

3. Documented Indian Burning Practices.

The following eyewitness accounts and knowledgeable observations are representative of the types of documentation of Indian burning practices that exists for southwest Oregon.

"Canoes were made from the trunk of a tree, hollowed out and shaped by means of fire. Pine, fir and cottonwood were the species used, and the completed vessel was blunt at each end, and those made by the Rogue River Indians were flat-bottomed. The tree having been felled by burning off, or being found as windfall, was burned off to the required length and hollowed out by the same agency. Pitch was spread on the portion to be burned away, and a piece of fresh bark served to keep the flames from spreading too far. These canoes were propelled by means of paddles." (Walling 1885: 181).

"At that time Cow Creek valley looked like a great wheat field. The Indians, according to their custom, had burned the grass during the summer, and early rains had caused a luxuriant crop on which our immigrant cattle were fat by Christmas." (Riddle 1953: 37).

"If we may believe those pioneers, the country was one of primitive wildness, yet of obvious fertility and productiveness. The wild grasses grew in profusion, covering everywhere the land as with a garment of the softest and most luxuriant verdure . . . The hill tops, now mostly covered by dense thickets of manzanita, madrone, and evergreen brush, were then devoid of bushes and trees because of the Indian habit of burning over the surface in order to remove obstructions to their seed and acorn gathering." (Walling 1885: 334)

"Brush is not burned to drive game, Ground burned over to produce a better crop of grass to attract wild game. Done at times hazel nuts are burned over." (Cora Dubois, 1934 Tututni Field Notes: Notebook 6, Bancroft Collection, quoted in Pullen 1996, App. I: 16).

"Most of the township is covered with such a dense growth of buckthorn, manzanita, lilac, madrona, chinquapin, and sweet acorn that no grasses can thrive. A small area on what is known as Peavine Mountain, in sec. 21, sustains a growth of native peavine sufficient to graze a few head of cattle for about six weeks. It is an historical fact that in the days immediately following the occupation of this country by the Indians this country was all covered with a fine growth of native grasses and practically no underbrush. The Indians accomplished this by setting fire to the vegetation on one side of the river one year and the other side the next year. Thus they kept the country open and clean and were never in danger of a forest fire." (From the "General Description" for Tsp. 34 S., Rng. 8 W. by Norman Price, US GLO Surveyor, ca. 1900)

"**Taprivna**, special name for tanoak acorns after a fire has burnt the leaves off the ground. They are good eating, are kind of sour. A piece of dried salmon and a few of these acorns taste pretty good. They wait till these acorns have fallen from the trees and then set fire to the leaves and it roasts them thus." (Harrington: Reel 6, quoted by Pullen 1996, App. I: 31).

"When the oak leaves began to fall fires were set on the hills. The ends of the curved lines forming the circles of fire did not meet, and in this opening women stood rattling deer-bones, while men concealed in the brush were ready to shoot the deer as they rushed out." (Holt 1946: 310, quoted in Pullen 1996: App. III: 24).

September 17, 1841. " . . . from daylight to ten a.m. hunting the horses in the smoke . . . through valleys . . . principally oak trees with grass growing under them . . . The prairies mostly today are on fire, winding its course slowly with the wind across the plains and up the hills . . . our route lay directly through where it was burning but the grass is not thick enough to render it very dangerous, and we crossed without injury; it is well the grass is not more than it is or our route assumedly would be extremely perilous, it is probably owing to the fact that the prairies are burned every year that the grass is so thin" (Eld, cited in Boyd 1986: 72, quoted by Pullen, App. III: 16-17).

September 22, 1841. "on the 22nd they began their route across the Umpqua Mountains . . . On the top was a small, grassy plain, along which they traveled for a short distance, after which they descended rapidly to a valley where water was found . . . The woods had lately been on fire here, and many of the trees were still ignited. The fire had evidently been lighted by the Indians for the purpose of causing the trees to fall across the path; they had also tied some of the branches together, and interlocked others [brush fences for deer hunting?]. Everything was charred, and the more annoying on that account as our people were completely covered with charcoal dust . . . In different directions, dense smoke was seen arising [widespread cooking and heating fires?], denoting that these savages were on the watch for the

party, and making signals to muster their forces for an attack, if a favorable opportunity should offer" (Wilkes 1845).

September 24, 1841. "Started soon after sunrise, crossing rolling prairie land bordered by round hills . . . Saw frequent signs of Indians . . . and in crossing a mountain covered by thick brush . . . the country was mostly burned by the Indians" (Titian Ramsay Peale, quoted in Pullen 1996: App. III: 25).

September 26, 1841. "On our right [west], the mts. were burning, and sent up immense clouds of smoke . . ." (Titian Ramsay Peale, quoted in Pullen 1996: App. III: 23).

September 27, 1841. "Though we saw but one, a squaw who was so busy setting fire to the prairies around that she seemed to disregard us . . ." (Titian Ramsay Peale, quoted in Pullen 1996: App. III: 8).

August 22-23, 1853. "Scouts sent out reported that the Indians had retired a long distance into the mountains, setting fire to the woods in their rear, and almost obliterating their trail . . . Scouts reported late in the day of starting that the Indians had taken to the mountains west and north of Evans' creek; hence the general [Lane] ordered a halt and the forces encamped for the night. Early the following day (August 23), the line of march was taken up and the Indian trail was followed through very difficult country, mountainous, precipitous and bushy, where there was constant prospect of going astray, as the trail left by the savages was very dim and nearly obliterated by fire. Late in the afternoon, having crossed a high mountain, the command reached a branch of Evans' creek and halted for the night. The horses were allowed to feed on the bulrushes which grew by the side of the stream and which alone escaped the forest fires. Indian "sign" had been noticed, it being small patches of ground left unburned, recently killed game, etc., thus indicating the proximity of the enemy." (Walling 1885: 218-219).