

The Owl Ridge Trails Project:

*Location and Documentation of
Primary Travel, Trade, and Resource Use Trails of the Santiam Molalla
in the South Santiam River and Blue River, Oregon Headwaters,
from 1750 to 1850*



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June 30, 2008



Mission Statements of Confederated Tribes of Grand Ronde

*The mission of the **Confederated Tribes of Grand Ronde** staff is to improve the quality of life for Tribal people by providing opportunities and services that will build and embrace a community rich in healthy families and capable people with strong cultural values. Through collective decision making, meaningful partnerships and responsible stewardship of natural and economic resources, we will plan and provide for a sustainable economic foundation for future generations.*

*The mission of **Site Protection** is to manage our cultural resources in accordance with our traditions, applicable laws, regulations, and professional standards, wherever they occur on our tribal lands, our ceded lands, and within our traditional usual and accustomed gathering places.*

*The **Cultural Collection** program's mission is to preserve and perpetuate the cultural heritage of the original tribes of the Grand Ronde community by acquiring, managing, and protecting tribally affiliated collections through exhibition, loan, and repatriation.*

*The **Cultural Education** program's mission is to preserve and perpetuate the cultural and linguistic heritage of the original tribes of the Grand Ronde community.*



Mission of Oregon Websites and Watersheds Project, Inc.

***Oregon Websites and Watersheds Project, Inc.** shows students how to use Internet communications and scientific methodology to help manage Oregon's natural and cultural resources. Students are encouraged to use computer technology, historical documentation, scientific reasoning, community outreach, environmental enhancement projects, and effective long-term monitoring strategies to help make decisions, which affect Oregon's quality of life.*

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Bob Zybach,
Springfield, Oregon
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Cover: Three elders at Gordon Meadows during camas bloom. Bob Tom and Don Day of the Confederated Tribes of Grand Ronde, and Wayne Giesy, Oregon Websites and Watersheds Project, Inc. Photographed by report author, June 18, 2007.

Owl Ridge Trails Project

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The Owl Ridge Trails Project:

Location and Documentation of Primary Travel, Trade, and Resource Use Trails of the Santiam Molalla in the South Santiam River and Blue River, Oregon Headwaters, from 1750 to 1850

Executive Summary

Owl Ridge is a key landscape feature of an ancient 250,000-acre or larger camas prairie, berry patch, beargrass meadow, old-growth conifer, summer home, hunting grounds, campground, wetland, beaver marsh, fishing hole, and ridgeline trail complex that dates back millennia before white discovery and occupation. The well-defined patterns of land use, management, and occupation were likely maintained by Santiam Molalla, Blue River Molalla, Santiam Kalapuya, Calapooia Kalapuya, Klamath, Wasco, Paiute, and Cayuse families and communities and their predecessors, ancestors, friends and neighbors for perhaps 2,000 to 3,500 years, or even longer.

These attractive and highly productive lands drew travelers, hunters, traders, basketweavers, cooks and food gatherers since time immemorial, for extended periods of time in the same places, often with the same families, year after year. Today the land is mostly managed by the USDA Forest Service, from the Sweet Home, Sisters, and Blue River Ranger Districts of the Willamette and Deschutes National Forests. These lands were once occupied and managed by ancestors of the Confederated Tribes of Grand Ronde. Tribal members today, and their generations in the future, bear a special relationship to these ancestral lands.

Project Purpose. The primary purpose of this project is to learn more about the geography, ecology, and life-ways of the Molallan families who lived and worked in the South Santiam River and Blue River headwaters during late precontact and early historical time (1750-1850). The principal method used to achieve this result was to locate and document relict evidence of plant and trail use by these people during the 1750-1850 time period. Products created by this project, including maps, reports, GIS layers, photographs, and websites, are intended to have educational, recreational, and cultural value, and to be used for purposes of resource preservation and restoration.

Project Funding. This project was made possible by a generous contract agreement provided by the Grand Ronde Confederated Tribes (“the Tribe”) to Oregon Websites and Watersheds Project, Inc. (“ORWW”). Additional project resources have been provided by NW Maps Co., USFS Sweet Home Ranger

District, Cascade Timber Consulting, Inc., Phoenix Reforestation, Inc., and the US Army Corps of Engineers.

Project Background and Description. This report is the final product of the Owl Ridge Trails Project, which began with the coincidence of a planned ORWW September 8-10, 2006 conference on historical Kalapuyan resource management in the Willamette Valley, and an August 3, 2006 Albany newspaper picture of Gordon Meadows in full bloom with camas (Paul 2006). Camas was needed for the conference, and public land seemed a good place to get it. A trip to the meadow and a brief automobile exploration of the surrounding landscape helped us realize that Gordon Meadows was only one portion of a landscape-scale pattern of relict prairies, berry patches, and old-growth groves hundreds of years old. This landscape strongly reflected the actions of past cultures -- of which very little is known.

Shortly thereafter I contacted Grand Ronde Tribal member Pat Allen, who arranged a meeting with the Grand Ronde Tribal Council. After hearing about the Owl Ridge area, the Council formed a committee to learn more about the land, and to develop recommendations for its possible care and use. The committee was headed by David Lewis, Director of the Grand Ronde Cultural Resources Department, and included Wayne Giesy, a director of ORWW. Over the course of the next several months, a contractual agreement was developed between the Tribe and ORWW to complete the work summarized in this report. Field work was started by members of Phoenix Reforestation, Inc. (see Table 2) on August 4, and completed September 20, 2007.

The project study area includes the headwaters of the South Santiam River and Blue River, a 120 square mile rectangle (see Map 1) including more than 130,000 acres of forestland. We documented native trails, berry fields, camas meadows and other land uses at nearly 500 GPS points and with more than 1500 photographs. Local historical information, photographs, and QTVR files detailing native plants and wildlife found in the South Santiam River basin have been placed online at the ORWW educational website.

General Findings. The following list of research findings is based on information acquired through archival and field survey methods used on this project, and on subsequent analyses of documentation acquired through those means:

- 1) The theoretical ridgeline trail network model used to produce the project's predictive map proved vital to the success of this project. Such maps can likely be developed and used with confidence for similar purposes in other forested areas of the region.

- 2) All contiguous locations in the study area are less than 25 miles distance by trail from one another; meaning that, in the absence of snow, everyplace could be reached by walking in a day's time or less.
- 3) Most of the study area is high elevation and inaccessible due to snow for much of the year.
- 4) There are a significant and widespread variety of edible berries, seeds, nuts, and bulbs in the study area that ripen across diverse aspects and elevations throughout the entire summer.
- 5) Most areas of historical human food production have become noticeably smaller in the past 50 years, and appear to have been diminishing in size for several centuries.
- 6) The evidence of greater human land use levels in the past may have encouraged much larger populations of deer and elk in those times.
- 7) Local and anadromous fish were probably not sufficiently abundant in numbers or large enough in size to form a regular staple of Santiam Molalla diets.
- 8) Large amounts of commercial-grade weaving materials could be found at all elevations, but prized beargrass could only be obtained above the 3,000 foot level.
- 9) Woody fuels can be readily found within several minutes walk in almost every part of the study area.
- 10) Freshwater can be found easily in almost all parts of the study area, during all seasons, at most elevations.
- 11) The mainstem South Santiam River and McKenzie River corridors, leading from the Willamette Valley to the Santiam Pass and eastern Oregon, were strategic holdings for Santiam Molalla.

Research Questions. This data is intended to be used for educational and resource management purposes. The following questions are examples of the types of uses of this material that can be developed as hypotheses in academic settings for educational or research purposes. Answers to these types of questions can also provide good information for better managing these resources in the future.

a) Were Molallans the dominant culture in the study area during late precontact time? Had they lived in the area for many generations, or were they more recent arrivals? Did they live in the area year-round, or just visit seasonally?

b) If the Molalla only arrived in the western Cascades sometime after 1750, who were the previous occupants? What became of those people, and when did it happen, to allow such free access to the Molallans?

c) If the Molallans have actually lived in the western Cascades for hundreds or thousands of years, what caused them to mostly abandon the once-largely agrarian huckleberry, beargrass, and camas fields throughout the study area? Were their numbers reduced by disease, famine, or warfare? Did they simply develop more efficient methods of survival?

Conifer tree populations have apparently expanded their range and population densities over the course of the past 300 to 500 years within the study area, a pattern that seems common throughout much of the Douglas-fir Region.

a) If so, is this a function of climate change or some other natural, nonhuman, phenomenon?

b) If so, is this a reflection of changing human populations, market values, resource management methods, politics, or other human-related cause? Are conifer expansions related to human population declines in some way?

Huckleberry fields, old-growth trees, ridgeline prairies, brakes and wildflower meadows have all been seemingly reduced in size and numbers during the past 50-250 years.

a) If so, should efforts be made to restore these trees and lands to past conditions? How and why?

b) Should this be a concern of government, Tribes, or private citizens?

Recommendations. The value of these findings and questions is directly related to the uses to which they are put. The primary purpose for gathering this information is to provide information of cultural, educational, and resource management value to the Confederated Tribes of Grand Ronde. The following recommendations are made with that purpose in mind:

1. Trails Research. Continue and expand this type of ancestral land use research and documentation on the public lands of western Oregon. Partner with BLM, the US Forest Service, US Fish & Wildlife Service, and/or USDI National

Park Service for purposes of funding, information sharing, and collaborative resource management opportunities.

2. GIS Mapping. Field data from this project has been gathered and transformed into discrete GIS layers by the Grand Ronde Mapping Department. This data has already been used for a number of useful GIS mapping products. Other uses can include recreational trails and road maps, educational maps and tables, and archaeological inventory and predictive maps.

3. Gordon Meadows Restoration. Gordon Meadows is a secluded camas prairie surrounded by huge 350-year old conifer trees and fields of blue mountain huckleberries and wild strawberries. It is contained in a subbasin of about 2,000-acres that can serve for demonstration and experimental purposes. Information resulting from experimental findings and demonstration projects such as this would be very helpful for future cultural and natural resource management, restoration, interpretation, and protection purposes. *[NOTE: see Zybach 2008 for additional information on this recommendation.]*

4. Public Education. Information discovered and documented during the course of this research can be put to excellent use for purposes of public education regarding Oregon history and geography, Santiam and Blue River Molalla life-ways, Cascades wildflowers and wildlife, cultural resources protection, meadow restoration, and a wide range of related topics.

1. Santiam Molalla History, Culture, and Geography

The name “Molalla” has at least 27 historical spellings. It is said to be derived from the words “moolek” for elk and “olilla” for berries (Winkler 1984). This would seemingly be a good name for their land, which produced abundant elk and berries, as well as for the people, who were known to extensively trade specialty products from these plants and animals. Preserved huckleberries and blackberries, elk hides, jerked meat, and elkhorn spoons were all trade goods associated with Molallans. Beargrass and willow weaving materials were also important trade items, due to their universal value and general abundance in Molalla lands. The Santiam Molalla were known as good elk hunters, good berry pickers, accomplished traders, bitter and fierce enemies of the Cayuse to the east, and good friends, family, and business associates with the Klamath to the south. They were also said to be poor guides when more than 35 miles from their homes, indicating a relatively concentrated and productive Tribal territory of seasonal use and trade route patterns (Minto 1903).

Molallan Geography. Very little is known about the Molallan history or culture (Winkler 1984; Ruby and Brown 1986; Zenk and Rigsby 1998), but there is good agreement on early historical Molallan geography. During the 1750-1850 late precontact/early historical time period of this study, Molallans occupied nearly the entire western slope of the Oregon Cascades Range, from the Columbia River south, almost to California. The Molalla are believed to have been organized into three, or possibly four, major “bands,” or tribes. The Southern Molalla inhabited the western Cascades of the Umpqua River and Rogue River basins of the western Cascades. The Northern Molalla lived on the western slopes of Mt. Hood in the Clackamas River, Molalla River, and Pudding River headwaters, south to Silver Creek, east of present-day Salem, and the Santiam Molalla (named for an historical Kalapuyan leader who lived in a townsite near the confluence of his namesake river and the Willamette) lived on the western slopes of Mt. Jefferson and Three Sisters, on the headwaters of the North Santiam, Middle Santiam, South Santiam, Smith, Blue, McKenzie, Mohawk, and Middle Fork Willamette rivers. The Mohawk, Smith, and Blue rivers are northern tributaries of the McKenzie River, and all the named rivers are eastern tributaries of the Willamette River.

A fourth possible Molallan band is a division of the Santiam Molalla into two groups – one along the headwaters of the Santiam River, and the other along the headwaters of the Blue, Smith, McKenzie and Middle Fork Willamette rivers (Winkler 1984). This research provides some evidence for the likelihood of such a fourth band, and I occasionally reference these people in this report as “Blue River Molalla,” to differentiate them from the 1855 Treaty Band “Santiam Molallans” (Ruby and Brown 1986) who lived along the South Santiam River. Blue River headwaters and South Santiam River headwaters are separated by a

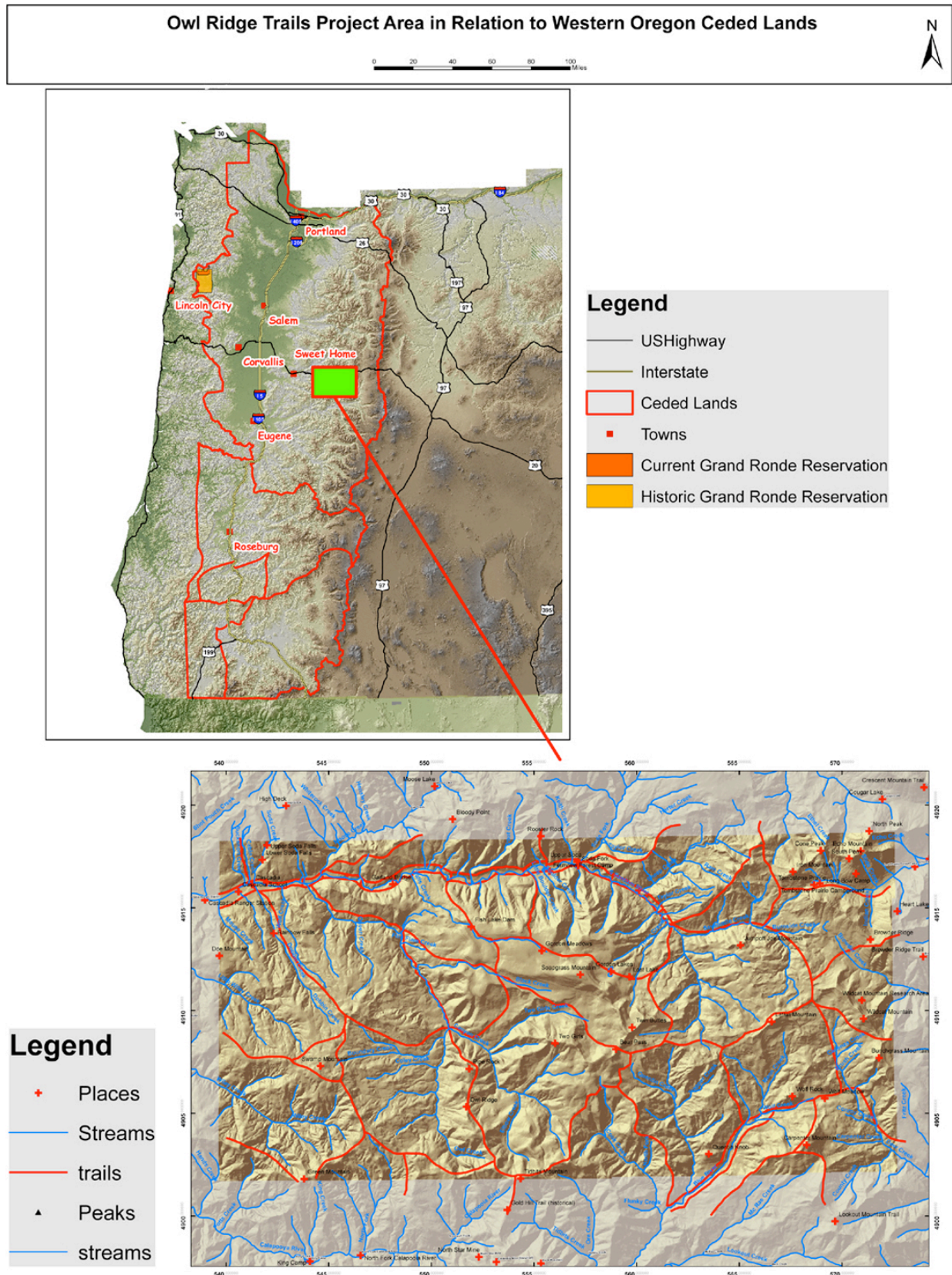
4,000 feet high, 25-mile long ridge that is covered with snow more than half the year, separating families and communities whose winter homes were within the two different (Santiam and McKenzie) river basins. Communities would have still been able to maintain contact via lower elevation Willamette Valley trails, but travel distances would have been much greater than taking the seasonal ridgeline trails, and the low elevation routes may have also been invasive of Santiam Kalapuya and Calapooia Kalapuya lands to the west.

Santiam Molalla Geography. On May 7, 1851 at Champoeg, Oregon, a Santiam Molalla man named “Coastnah” signed a treaty with the US government, on behalf of the 65 remaining men, women, and children of his Tribe, agreeing to sell a major portion of their ancestral lands and open them to white settlement and management. The treaty was never ratified by Congress, but provides a good idea as to known Santiam Molallan national boundaries, firmly in place at the time of the 1850 Oregon Donation Land Law (Carey 1972: 253). These boundaries were openly declared by the Santiam Molalla, and were formally confirmed by representatives of neighboring tribes of Santiam and Calapooia Kalapuyans to the west and south, and of Northern Molalla to the north. Paiute, Wasco, Warm Springs, and Cayuse to the east and Klamaths to the south also confirmed Molallan claims over western Cascade lands, at later times and under less formal circumstances.

The generally rectangular area of land owned and occupied by the Santiam Molalla in 1850 extended from the east-west mainstem of Silver Creek (east of present-day Salem) on the north; south along the western Cascade Range foothills; to the mainstem Middle Fork Willamette River; then east to a point along the Cascade crest due east of the Middle Fork headwaters; then north along the crest of the Cascades to a point due east of the headwaters of Silver Creek, and then west to the point of beginning along the Silver Creek mainstem (Gibbs and Starling 1851). These boundaries reflect millions of acres of prime timberlands, pasturage, berry fields, rivers, lakes, and streams that had apparently been used and occupied by much larger numbers of people in the decades and centuries preceding 1850.

The current study area is a significant but relatively small portion of the former Santiam Molalla lands. It is an area 21 miles long and ten miles wide (210 square miles), totaling about 130,000 acres (see Map 1). This area also includes the headwaters of South Santiam River and Blue River (tributary to McKenzie River). Fish Lake and Obsidian Cliffs to the immediate east of the study, are strategically located adjacent to a major Cascades Range pass (“Santiam Pass”) between eastern Oregon and western Oregon. This area also historically included primary trade routes between Klamath Indians to the south, Willamette Valley Kalapuyans to the west, Warm Springs Indians to the north, and Northern Paiutes to the east.

Map 1. Location of Owl Ridge Trails Project to western Oregon ceded lands.



Santiam Molalla History. During the course of this research, field surveyors (see Table 2) documented several relict old-growth groves, meadows, brakes, berry patches, balds, ridgeline grasslands and wetland prairies of the South Santiam River and Blue River mainstems and headwaters. These plants and fields have been measurably shaped and maintained by human hands for centuries and millennia (Boyd 1999b; Zybach 2002; Anderson 2005), yet numerous accounts claim that Molallans only arrived in the western Cascades a few generations, at most, before the arrival of whites.

In 1937, geographer and anthropologist Joel Berreman wrote that 1750 was the earliest possible date that Molallans could have moved into the Willamette Valley (Berreman 1937).

In 1972, anthropologist Harold Mackey wrote:

There is agreement that originally their [Molallan] hunting area included part of the present Warm Springs Reservation, the middle Deschutes, and a mountainous area between Mt. Hood and Mt. Scott. However, sometime around 1810-1820 they were driven out of the area by the more numerous Tenino. (Mackey 1972: 63)

In 1986, fifty years after Berreman, Ruby and Browns' "Guide to the Indian Tribes of the Pacific Northwest" stated:

[The Molalla] lived near the eastern slopes of the Cascade Mountains of central Oregon near the Warm Springs River . . . Less aggressive than the Cayuses, the Molalas were pushed westward sometime after 1780 by more aggressive tribes. (Ruby and Brown 1986: 137)

These relatively recent figures of 1750-1820 for perceived Molallan immigration into western Oregon are surprisingly consistent with a much earlier version given by an actual Molallan person in his native language. The following account is summarized from Mackey (1981: 63-65):

In December 1877, anthropologist Albert S. Gatchet interviewed Steven Savage, a native Molallan, at the Grand Ronde Indian Agency. Savage responded to Gatchet's questions in Molallan, and then helped him to translate the text line by line into literal English. These documents were added at some time to the Smithsonian Institute's Manuscript file No. 998, where they apparently remained unused until about 1980, when Mackey became aware of them.

Savage recounts the story of Cayuse horsemen, who had conducted a successful slave raid of Willamette Valley Kalapuyans and were returning to their home in eastern Oregon, when two of the Cayuse members chased down, murdered, and

dismembered a Molallan man named Phkaiosh. The Cayuse then raided the nearby Molallan homes, but the residents had fled. A Molallan man named Pshairsh tracked the Cayuse to the scene of the murder, gathered Phkaiosh's body parts and returned them to his home, as was customary treatment with Molallan dead.

Pshairsh was said to be still living at Grand Ronde in 1847, and Mackey places these events at 1820-1825 as partial result of that information. If Mackey's estimates are correct, then these events took place just a few years before the 1826-1828 establishment of Champoeg (near the Pudding River territory of the Northern Molalla), and only about ten years before the establishment of the 1834 Methodist Mission (near present-day Salem, and downstream from both the Northern Molalla and the Santiam Molalla).

A few days after Phkaiosh's murder, according to Savage, a Molallan-initiated vendetta battle took place near the western Cascade summit that resulted in the killing of nine Cayuse and only one Molalla. This event was said to have resulted in a permanent separation of the two tribes and an ending of Cayuse slave raids into the Willamette Valley.

Savage's battle account is corroborated in timeframe, combatants, and outcome by nearly the same story 25 years later in 1903, by John Minto, an early white resident, western Cascade mountaineer, and regional historian. Minto wrote of local 1830s-era Kalapuyan (or possibly Molallan) oral traditions as the basis for his discovery of Minto Pass in the 1870s:

There was a tradition among the Indians of the central portion of the Willamette Valley at the time when the missionaries of the Methodist Episcopal Church attempted christianization from 1834 to 1840, that a trail or thoroughfare through the natural [Santiam] pass had formerly been much used by their people and that its use was abandoned after, and as one of the results of, a bloody battle between the Mollalas (who claimed the western slopes of the Cascades from the Clackamas River south to the Calapooia Mountains,) and the Cayuses who were originally of the same tribe, but who had become alienated by family feuds, of which the battle or massacre of their tradition was the end. (Minto 1903: 241)

Probably the most thorough analysis of early historical and precontact archaeological sites in the historical territory of the Santiam Molalla was made by Carol Winkler (1984), a US Forest Service archaeologist who conducted a study of Molallan sites in the Middle Fork Willamette River basin to the south of this study area. Her research led to an entirely different conclusion, and she cites the authorities for her thinking:

According to the most recent historic and ethnographic research published (Farmer et al, 1973; Beckham 1976; Bryant et al. 1978; Beckham, Minor, and Toepel 1981, 1982; Rigsby n.d.), most of the Western Cascades had been inhabited by the Molala, who spoke a language isolate of the Penutium phylum, for perhaps 5000 or more years before Euro-American contact. Rigsby (1965, 1969) essentially disproved the existence of the “Waillaptuan” language family consisting of the Cayuse and Molala languages, proposed by Hale in 1846, and the concomitant hypothesized Molala intrusion into the Western Cascades. (Winkler 1984: 4)

Winkler’s conclusions are further supported by the more recent linguistic research of Zenk and Rigsby (1998). These two entirely different perspectives regarding the history of Molallan occupation of the western Cascades (recent immigration vs. ancient occupation) are addressed in the “Questions” and “Recommendations” sections of Part 8. For the purposes of this report, I have generally assumed the following to be true:

- 1) Santiam Molalla lived in the study area nearly year-round from 1750 to 1850 (Winkler 1984);
- 2) They were the dominant culture in the study area during that time (Zenk and Rigsby 1998); and
- 3) Their population was likely much greater in 1750 and in 1800 than in 1850 (Boyd 1999a).

2. Project Research Methods and Boundaries

The purpose of this project was to locate and document relict evidence of cultural plant and trail use by Santiam Molallans during the 1750-1850 time period of the study. The location of information -- whether in a library, through discussion, or in the woods -- required appropriate research methodology for value; while documentation required current technical formatting to be useful. Much of the resulting value of this information is to address the types of assumptions that conclude Part 1 of this report:

Were Molallans the dominant culture in the study area during late precontact time? Had they lived in the area for many generations, or were they more recent arrivals? Did they live in the area year-round, or just visit seasonally?

In order to complete this project to contract standards, it was necessary to develop an operational plan using formal research standards to acquire pertinent information, and to use current technical methods to digitally document, duplicate, analyze, distribute, and otherwise help organize and use the resulting data. This process has resulted in a series of useful products for the Confederated Tribes of Grand Ronde, of which this report provides a summary. Other completed products include several new GIS mapping layers (e.g., see Maps 1, 5, 6, and 7), an Excel file containing codified information on the 495 GPS points systematically arranged across the study area (see Appendix D), about 1500 documentary digital photographs tied directly to the GPS points (e.g., see Tables 2, 3, 5, 6, 7, 8), three ORWW educational websites containing historical photographs that had been assembled for this project (see Table of Contents for links), and a formal plan for addressing Recommendation #3: the restoration of Gordon Meadows (Zybach 2008).

Research for this project was conducted in four basic steps: archival research, predictive map construction, “ground-truthing” the predictive map (field research), and synthesis. These are not discrete steps in any sense, and usually two or three were being taken at the same time throughout the course of this project. There is a general order in which each step was initiated, however, and a similar order as to their relative completion dates. This report represents the most recent synthesis of research findings for this project, for example, and the final step of the four to be taken in order to complete contract agreements.

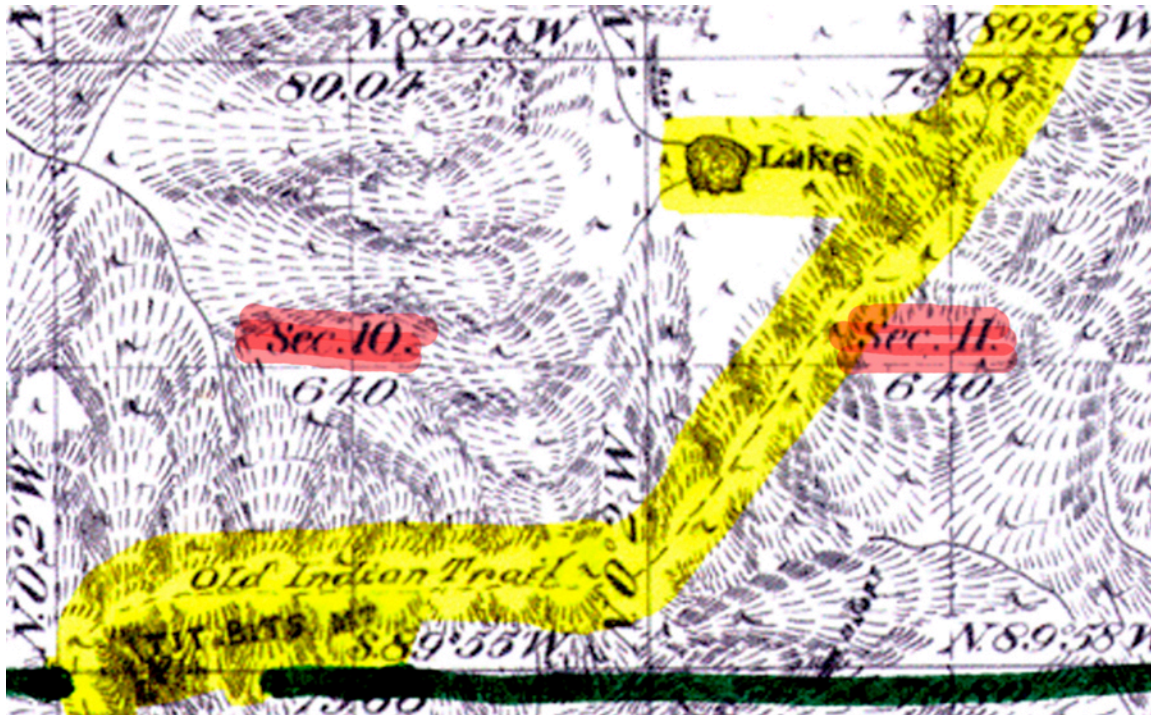
This part of the report briefly describes basic research methods and provides examples of the types of technology used to develop the predictive map, field test the results, and document the findings needed to complete this project. References and Internet links are provided for more detailed and comprehensive descriptions of these methods and types of documentation for purposes of further review, replication, or additional formal (constructive) criticism.

Temporal Boundaries: Archival Research. The beginning date of this research, 1750, was partly chosen because it was the earliest date given by Berreman (1937) for the migration of Molallans into the Willamette Valley and the west slope of the Cascades. This date also precedes the first western Oregon contacts with white and black traders and explorers, beginning in the 1770s and 1780s (Carey 1971). These contacts were followed immediately by plagues of smallpox, malaria and other diseases from Europe and Africa, and brought devastating results to local people with no immunities to those diseases (Boyd 1999a). It is likely these introduced diseases were transmitted to the Santiam Molalla on several occasions between the 1770s and 1850, and decimated their populations during those decades. It is impossible to comprehend the despair, fear, and confusion the survivors must have felt. 1850 was selected as a terminus because it is the year the Oregon Donation Land Law was enacted, and when Santiam Molalla lands were legally opened to white settlement and to federal control by the US Government (Carey 1981).

Coastnah's spring 1851 negotiations with the US Bureau of Indian Affairs to accommodate the growing flood of white settlers into his country and to care for his remaining citizens (Part 1) may, in fact, be the earliest historical record of the Santiam Molalla. Molallans first enter the historical record in the journals of Willamette Valley missionaries and Hudson Bay Company beaver-trappers in the 1830s and 1840s, and possibly earlier, but these were almost entirely Northern Molalla and Southern Molalla, whenever their homelands were identified. There seems to be no direct historical record of the Santiam Molalla, or of any member of that Band, during the 1750 to 1850 time period of this study -- which time also represents only the last 100 years of native Oregon Indian ownership, management, and residency of the western Cascades in a history of more than 10,000 years. This research is to find the trails these people walked, the foods they ate, and the sights they saw during those last 100 years.

Geographic Boundaries: Predictive Map. Map 1 shows the research boundaries determined for this project. These boundaries were selected on the basis of several criteria: they closely conformed to land forms that implied complete trail loops and links, rather than segmented bits and pieces of trail; they included several known features and plants of specific interest (e.g., Gordon Meadows, Cascadia Caves, huckleberries, camas, etc.); and they conform closely to both original General Land Office (GLO) surveys (see Maps 2 and 3) and to current USGS 7 1/2 quadrangle map boundaries. The GLO surveys are most important for historical research purposes, while the USGS maps (e.g., see Map 4) are the State and federal standard for recording cultural resources. These two map series (GLO and USGS) were used in combination with a 1938 Linn County map atlas (Metsker 1938) to create the principal predictive maps for this project. This process of GLO predictive trail map creation is shown in greater detail in an

Map 2. Annotated fragment of 1907 GLO map of Tsp. 15 S., Rng. 4 E.



article in which the principal Alsi, Yakona, Siuslawan, and Kalapuyan trails in the Alsea River headwaters of Benton County are used as an example (Zybach 2002):

www.NWMapsCo.com/ZybachB/Articles/Alseya_Valley_2002.pdf

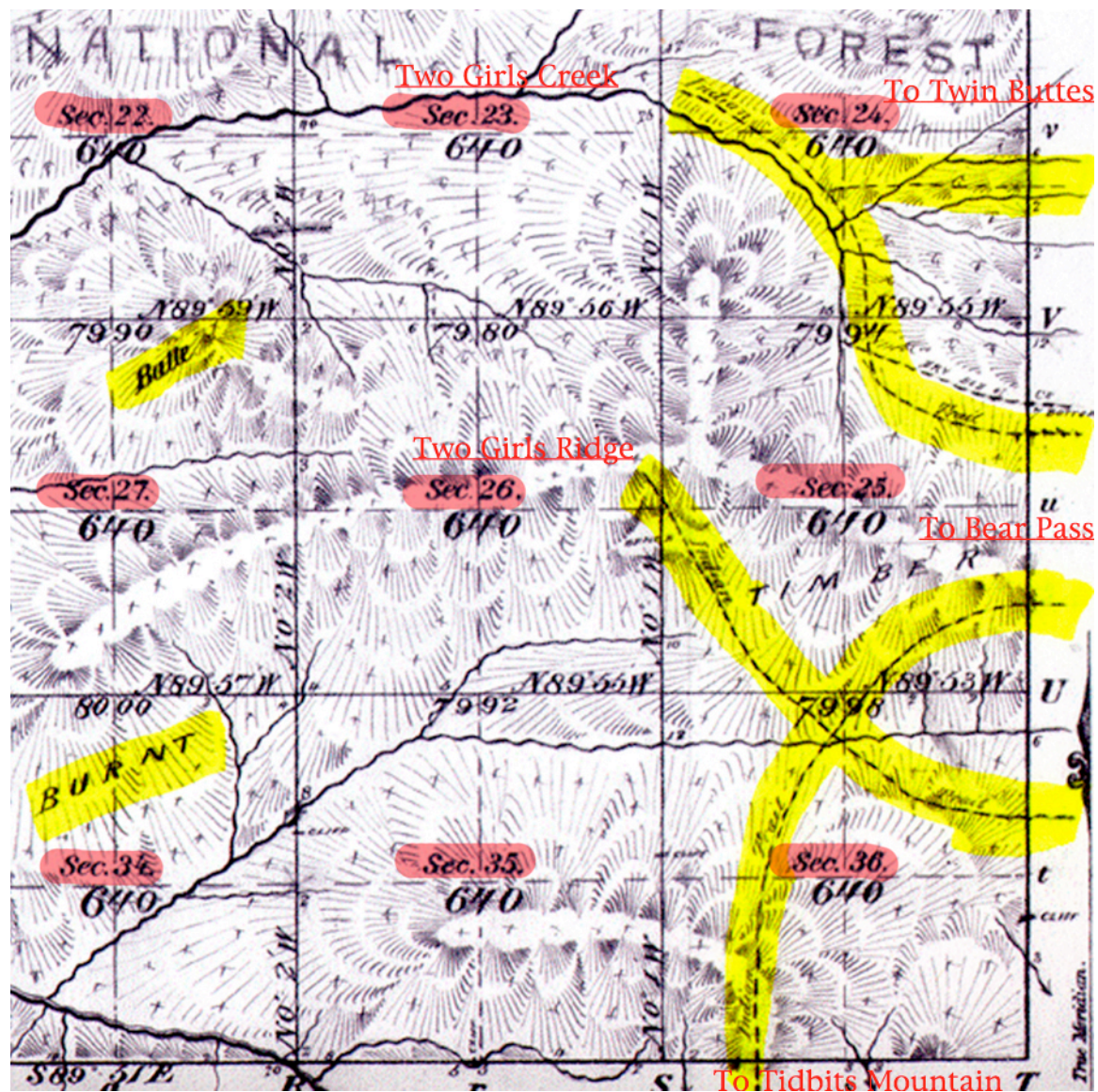
The theoretical ridgeline trail network model used to produce the project's predictive map proved to be highly accurate and vital to the success of this project. This demonstrates that such maps (and their hypothetical basis) can likely be used with confidence in other forested areas with similar topographies. A "predictive map," for purposes of this project, then, has two basic functions: 1) to assemble available documentary and theoretical information into a map format designed to predict locations with the greatest likelihood of containing physical evidence of interest, and 2) to serve as a basis to inventory field results, findings, locations and condition of valued cultural resources. The original predictive maps used for this project, roughly sketched on the eight 7 1/2-minute USGS quadrangle maps, can be found here:

www.ORWW.org/DRAFT/Owl_Ridge_Project/Maps/

The black and red dotted lines on this map represent possible trail locations, the solid red lines represent (usually) final trail locations (see Map 5), and the small circles represent the first grid of GPS points that needed to be evaluated and

documented in the field (see Appendix D). These data were subsequently gathered and entered into the Grand Ronde computer system by Volker Mell, the Tribal GIS technician, and can now be used for a variety of map products, including a much improved and updated digital predictive map for the area.

Map 3. Annotated fragment of 1895 GLO map of Tsp. 14 S., Rng. 4 E.



Predictive maps are largely a theoretical construct, guided by available information. They are tested and improved by two basic processes: “ground-truthing” the map in the field (including on-site examinations and local and expert interviews), and by archival research. These processes were carried on simultaneously for this project, and are illustrated in these pages with historical map fragments, tables, and figures.

Map 4. Annotated fragment of 1901 USDI map of central Oregon Cascades.

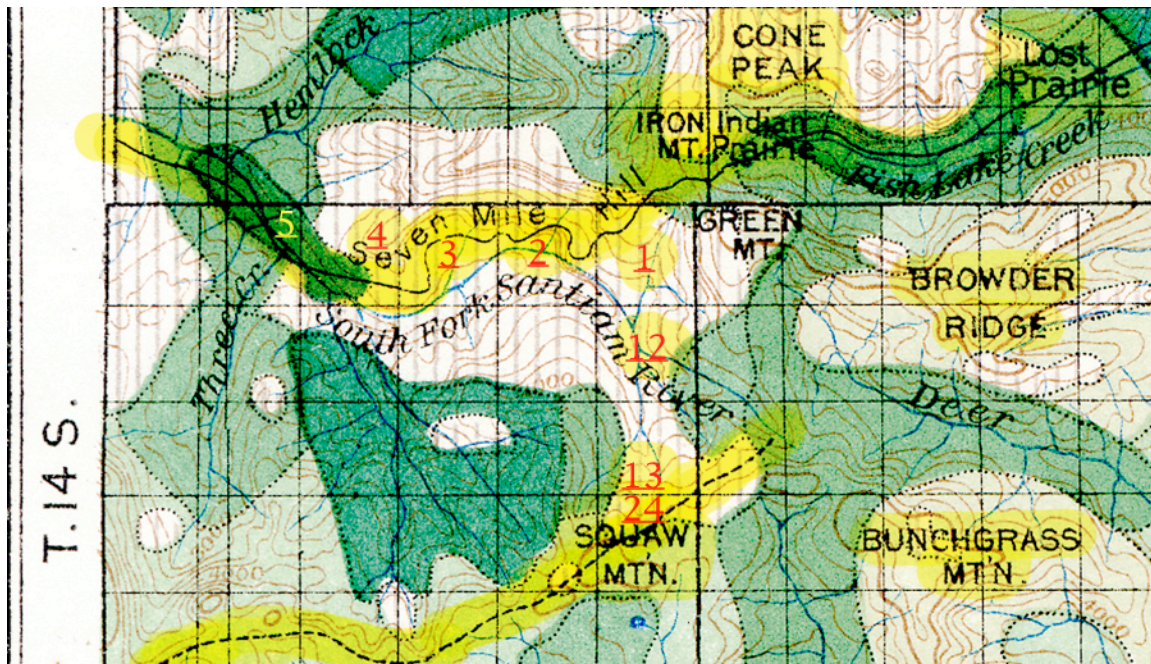


Figure 1. Excerpt from 1903 USDI Plummer report re: Tsp. 14 S., Rng. 5 E.

About 35 per cent of the total area is burned. The burn in sections 13 and 24 is very old and was an Indian hunting ground. The burn in section 12 and part of section 13 occurred in 1896. That in sections 1, 2, 3, and 4 occurred in 1885, and again in 1897.

The heavy timber in section 5 is old growth but not first class, being sometimes limby and windshaken. The proportion of poor timber is about 10 per cent. Although the timbered areas were saved from the big burn, the trunks were scorched to a height of 20 feet or more, showing that fire ran through the underbrush but failed to ignite the timber.

Project maps, and locations within the maps (see Appendix A), use standard legal descriptions and abbreviations that were adopted with the original GLO public land surveys in 1853, and that continue to be used on private property descriptions and other legal documents to the present time (Zybach 2002). GLO maps were created by surveying parallel east-west lines every six miles across the landscape ("Townships," abbreviated "Tsp."), and intersecting these lines with surveyed parallel north-south lines, also at six-mile intervals ("Ranges," or "Rng."). This process created a number of 36-square mile areas also called "Townships" and also abbreviated "Tsp.," to add a little confusion. Each resulting Township was then labeled with its unique Tsp. and Rng. numbers and subdivided into 36 individual square-mile parcels, named "Sections," and abbreviated "Sec." Map 2, for example, shows two square miles (numbered

sections 10 and 11) of GLO Tsp. 15 S., Rng. 4 E., and Map 4 (above) shows portions of four different Townships, of which sections 1-5, 12-13, and 24 are labeled in Tsp. 14 S., Rng. 5 E. Abbreviations for “south” and east” in these descriptions refer to the original 1853 starting point for these surveys, the Willamette Stone, near Portland, Oregon.

Archival Research. Figure 1 is an excerpt from the USDI report (Plummer 1903: 134) that was issued in conjunction with Map 4 and illustrates how written materials can help corroborate theoretical conjecture. In this example, the Latiwi (“Squaw”) Mountain Trail leads directly to a “very old” burn that “was part of an Indian hunting ground.” Further research identifies the trail as “Wylie’s Trail” (Hammond 1895), which had been blazed for stock in the late 1850s by Andrew Wylie, by following an “old Indian trail” (Minto 1903: 241-242; McArthur 1982: 653). Field research documented modern roads and trails in the same location, including numerous springs and relict huckleberry patches, beargrass meadows and thimbleberry fields. Archaeological evidence also confirms this is a major trail route (Farque, personal communication, September 18, 2007).

The maps, tables, and figures in this part of the report have been arranged to better illustrate the process of archival research and predictive map construction, followed by field research and documentation, and synthesis. Map 2 is an annotated fragment of 1907 GLO map Tsp. 15 S., Rng 4 E., showing a two-mile segment of an “Old Indian Trail” that travels northeasterly from “Tit Bits” (Tidbits) Mountain. The principal surveyor on this map was Ernest P. Rands, who was an experienced surveyor and very familiar with the local terrain. Eleven years earlier, in 1895, Rands had also participated in the subdivisional GLO survey of Tsp. 14 S., Rng. 4 E., in partnership with H. H. Johnson. At that time the two men mapped several more “Indian Trail” segments that directly connected to the “Old Indian Trail” to the south (see Map 3), but these trails crossed and had intersections; i.e., they couldn’t all be “primary” trail routes. In addition, none of the segments is more than a mile in length. One seems to end along Two Girls Creek, and another seems to end along Two Girls Ridge, and four segments seem to be heading toward Bear Pass (and Latiwi Mountain) to the east.

Map 4 helps resolve this conflict by identifying a single ridgeline route from Tidbits Mountain to Bear Pass and to Latiwi Mountain and beyond (see Part 4), but it doesn’t resolve the other “dead end” trail fragments surveyed by Johnson and Rands in 1895 (Map 3). Other GLO surveys were completed in the study area between 1870 and 1895 by Warner (1870), Barr (1879), and Pershin (1895), but these surveys were highly unusual in that they do not record a single trail or other evidence of human presence -- and such trails were certainly known in the area at that time, and were regularly used. In addition, these men only named three or four creeks and landmarks for the entire 36-square mile

area they surveyed, including “Elephant Mountain” (which name cannot be found in any other source), and yet they are otherwise highly accurate and detailed regarding drainage patterns, bearing trees, shrubs, slopes, and springs.

In addition to historical maps, survey notes, interviews and government reports, other sources of archival information were also used to test and refine the predictive map and other theoretical constructs used in this project. Historical photographs were used extensively for this purpose. Cone Peak is in the northeast corner of this study area, as shown on Map 4. Figures 2 (Plummer 1903: 132) and 3 (ibid.: 146) were photographed from Cone Peak in early July 1902, and clearly show well-developed ridgeline trails, and the last traces of snow for the summer. The view south also shows a significant portion of the research area. This is a good method to connect dangling trail segments, or to help determine primary travel routes, but historical photos of this age and quality are usually difficult to locate for most areas, including the entire remainder of the study area.

Beginning in the 1930s, however, most of Oregon’s forestlands were systematically photographed in great detail through the widespread use of two new inventions: the airplane, and the Osborne camera. Figure 4 is an Osborne photo (or “Osborne”) taken in 1933 showing the same Cone Peak eastern ridgeline on the left, as shown in 1902 in Figure 2. Note the man in the foreground and the strip of numbers across the top. Osborne negatives were curved in such a way as to avoid distortion at the edges of the photographs. They were also panoramic-scaled negatives that covered 1/3, or 120-degrees, of the horizon. In Figure 4, and all Osbornes, the numbers represent the points of the compass; e.g., 0/360 = due north, 90 = east, 180 = south, etc. The Osborne camera was used to take a complete 360-degree panoramic photograph series from every USFS fire lookout tower in the Pacific Northwest, and then posted those photos at each tower so fires could be telephoned in, and located by using compass points. These photographs were, in essence, highly detailed maps of the area they documented for the point of time in which they were made.

Figure 5 is an Osborne taken in 1933 from Twin Buttes Fire Lookout, north of Bear Pass. The perpendicular ridgeline is Two Girls Ridge, with the trail intersection to Tidbits Mountain clearly visible at 215-degrees (see link below for larger image). At the base of Two Girls Ridge is a pond or small lake, near the headwaters of Two Girls Creek. The Two Girls ridgeline trail and the pond are the apparent destinations of two 1896 “Indian Trail” segments, as shown on Map 3. Farque suggests archaeological evidence may be found in the area. The presence of relict patches of huckleberries and beargrass add credence to this suggestion. The trail segments are “dead ends” because they have led to destinations, not ended in blockades. All trails lead straight to Bear Pass, to the



Figure 2. View east from Cone Peak, July 1902. F. Plummer



Figure 3. View south from Cone Peak, July 1902. F. Plummer



Figure 4. View from Iron Mountain, northeast to south, September 1933. Snyder.



Figure 5. View from Twin Buttes, south to northwest, September 1933. Moe & Sorlin.

campgrounds in that area, and all directions of the compass from there. The six series of Osbornes (18 total) located within the Owl Ridge Trails Project study area can be found here:

www.ORWW.org/Osbornes_Project/

Table 1. Repeat aerial photography of Latiwi Mountain Trail, 1946-1981.

<p>Bear Pass 1946</p>	<p>Bear Pass 1981</p>
<p>Latiwi Mountain 1946</p>	<p>Latiwi Mountain 1981</p>

Aerial photographs from the 1930s are available for much of western Oregon, but the earliest sets that could be located for the study area were a spotty set (missing several photos) from 1944 at the University of Oregon, and a nearly complete private set from 1946, kindly lent to me for several weeks by Cascade Timber Consulting, Inc. Repeat photography is the process of comparing two photographs taken from the same perspective, but at different points in time. Aerial photographs are well suited for this purpose. Table 1 (above), for example, compares two segments of the Latiwi Mountain/Wylie Trail 1) before logging (from the general time of the Osbornes) to 2) after logging, precipitated by national post-WW II housing and paper product needs. The direct impact of clearcutting on old trail evidence, berry patches, and surface artifacts is obvious; and well documented. Just as obvious are the well-documented undisturbed areas in which it may still be possible to find undisturbed evidence. These photos, and select others of the study area obtained from University of Oregon and Cascade Timber Consulting, Inc. files, can be found in enlarged format with labeled landmarks here:

www.ORWW.org/Rivers/Santiam/South/Aerial_Photos/Headwaters/

Other types of archival information used during the course of this project included local histories (e.g., Carey and Hainline 1979; Olsen, et al. 1982), oral histories (Williamson and Milligan 1982), books (e.g., Stewart 2002, Anderson 2005), newspaper articles (e.g., Braman 1987; McClary 2007), and academic research (e.g., Anderson 1993; Zybach 2003). Museum collections, particularly those of photographs and local artifacts, could be an additional reference source, given time and resources to investigate.

“Ground-truthing”: **Field Research.** Ground-truthing is a principal method of testing theory, such as used to construct predictive maps. The specific theories of precontact land use patterns in western Oregon that were used to construct these maps are described and demonstrated in some detail in much of my earlier work (e.g., Zybach 2002; 2003). More general theories of plant use and land management that are consistent with this project can be found in Boyd (1999b), Stewart (2002), and Anderson (2005). The basic methodology of ground-truthing precontact and early historical Indian trails in western Oregon is described by Braman (1987), regarding the mapping of an 1840-1849 Klickitat horse trail from Kings Valley in Benton County, to Toledo in Lincoln County.

Ground-truthing for this project was performed by members of Phoenix Reforestation, Inc. (see Table 2). The method used was consistent with the documentation process ORWW developed on the B&B Complex project: using digital cameras, GPS receivers, maps, transportation, and clear weather to systematically photograph multiple-scale patterns of native plants across the landscape. A more detailed description of the process can be found here:

ORWW/CTGR 2008 Owl Ridge Trails Report

www.ORWW.org/B&B_Complex/Repeat_Photos_Grid/index.html

Daily Inventory Forms here:

www.ORWW.org/DRAFT/Owl_Ridge_Project/

Initial field research began with several informal trips to the project area by members of ORWW, the Grand Ronde Tribe, and Phoenix Reforestation, Inc. (see Report Cover, Tables 2 and 8). On the basis of these excursions, and the observations and opinions of those who participated, it was determined that further research was warranted, and led directly to the performance of this project. A partial record of a few of these field trips can be found here:

www.ORWW.org/Rivers/Santiam/South/Canyon_Creek/

Formal ground-truthing began with establishing a systematic grid across the predictive map, focusing on key locations such as creek crossings, peaks, springs, and mountain passes. Many of these were on private property, or located behind locked gates, landslides, or downed trees. Other areas had been heavily logged (see Table 1). Beginning with these selections, it was decided to have field researchers avoid posted or locked private lands, or dangerous situations, keep most trail hiking (except critical locations) to a minimum, and use their own best judgment when selecting other areas to document. The focus was on road and trail intersections, open vistas for documenting landscape-scale forest patterns, and areas of cultural vegetation, such as camas, huckleberries, beargrass, and willow.

Researchers generally worked in teams of two, taking GPS readings and photographs at select locations, recording their findings in the daily log (see previous link), and trying to determine a relative ranking for cultural plants and for the likelihood of Molallan trail use at each location. These efforts resulted in the establishment of 495 GPS points documented by 1500 photographs within the study area, in which nearly 1000 untested rankings were determined by eight different people in isolated circumstances from one another (see Appendix D). The rankings are intended to be dynamic and consistently refined and improved as new information is made available. The color-coded display of ranked points across the study area represents the next progression of the project predictive map, should it remain in use over time. GPS points, photograph identification, and cultural plant and trail use rankings are listed in Appendix D. Additional information regarding these points is included in the project Excel spreadsheet, which has been entered into the Grand Ronde computer system.

Table 2. Owl Ridge Trail Project 2007 field surveyors.

	
<p>Eric Esselstyn & Rocky Polries, Fishing Rock, August 2, 2007. R. Slattum</p>	<p>Keri Cribbs, Gordon Meadows, August 22, 2007. E. Esselstyn</p>
	
<p>Nana Lapham, Dobbins Creek crossing, September 17, 2007. B. Zybach</p>	<p>Bob Zybach, Swamp Mountain meadow, September 20, 2007. N. Lapham</p>
	
<p>Scott Brown on unnamed rock, September 8, 2007. N. Lapham</p>	<p>Greg Archuleta and Lifeways members at Gordon Meadows, July 26, 2007. D. Lewis</p>

In addition to basic documentation of each GPS location (road signs, road intersections, spring, etc.), an effort was made to photograph fruits, nuts and seeds, flowers in bloom, and identifying foliage of key cultural plants (see Appendix C). Panoramic photos were also planned for large prairies and meadows, or key vistas, with QTVR-style sequences favored. Finally, an attempt at a “Beauty Shot” was made in locations such as waterfalls, lakes and ponds, peaks, old-growth, rock outcrops, caves, and other locations that may have had significant cultural value to Santiam Molalla.

GIS. A general technical description of how to transform late precontact/early historical western Oregon political data to GIS can be found here:

www.NWMapsCo.com/ZybachB/Articles/DFR_Indians_1995.htm

Field data from this project has already been gathered and transformed into discrete GIS layers by the Grand Ronde GIS Mapping Department. Essentially, two new GIS map layers have been created: a map of the primary Santiam Molalla trail system in 1750-1850 (see Map 5), and the 1500 GPS-referenced digital photographs. This data can be used immediately for a number of useful GIS mapping products, as recommended in Part 8 “GIS Mapping” of this report. One of the listed suggestions, “an increasingly detailed and accurate archaeological predictive map and cultural resource inventory can be further developed and refined from the base model created for this project,” has been more completely described in this section of the report.

Maps 1, 5, 6 and 7 in this report, and the two maps used in the Gordon Meadows Restoration Plan (Zybach 2008), presented to the Grand Ronde Tribal Council on June 19, 2008, are products of these new GIS layers. Volker Mell, Grand Ronde Tribal GIS specialist, created these maps, and others used for this project. The Tribal GIS files also contain the 1500 photographs taken during this project, and all are georeferenced to the new maps as well. Ethnobotanists, foresters, archaeologists, and others can now use a combination of these products to conduct informal field inventories in an office environment.

3. Named Rivers, Creeks, Peaks, Other Landmarks, and Destinations

There are portions of two named rivers (South Santiam and Blue) and major headwater tributaries of four others (Middle Santiam, Calapooia, Smith and McKenzie) within the study area. These six rivers are fed by dozens of named creeks, springs, lakes, and ponds, and contain dozens of other named landmarks within their drainages (see Appendix A); also within the study boundaries.

Peaks, creeks, springs, caves, ridgelines and other named landscape features can serve as destinations, aids, impediments, or barriers to travel, depending on time and circumstance. People traveling by foot are more apt to notice (and name) a particularly dangerous creek crossing, for example, than someone traveling by automobile and crossing at the same location on a four-lane highway bridge.




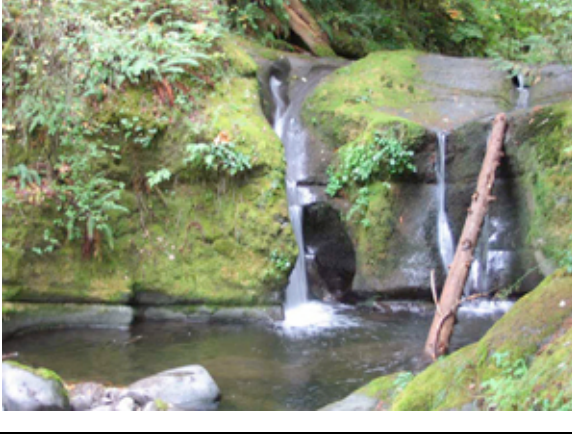


Each of the 32 named trail segments (see Part 4; Appendix B) that was determined to be a likely principal Molalla trade and travel routes, has a discrete beginning and ending point that can be mapped and measured. Further, each of these segments link with one another as to form efficient routes between all primary destination points known to be within, and adjacent to, the study area.

By using these criteria, and by eliminating duplication and secondary routes wherever possible, it became apparent that six areas in particular were key destination or meeting points for purposes of travel, trade, hunting, gathering, processing, and/or product manufacturing: Cascadia; South Santiam Prairie Complex; Owl Creek-Swamp Mountain; Bear Pass; Wolf Rock; and Latiwi Mountain (see Maps 5, 6, and 7). All major foot-trail routes in the study area connect directly with each of these six areas, all of which have good options for traveling to key locations outside the study area as well.

Cascadia is an area that includes about a two-mile long prairie and hillsides on both sides of South Santiam River. The well-known Cascadia Caves are located here, as is Cascadia Park. Snow rarely stays on the ground for any length of time during the winter (S. Lennen, personal communication, October, 2007), and it appears that this is the most likely location for a year-round Molalla townsite in the study area. Relict camas plots are scattered throughout the community, and the only oak documented during this research is also located here. Finally, the area is extremely strategic for monitoring and regulating traffic along the river to Santiam Pass.

South Santiam Prairie Complex is the series of alluvial fields and meadows that exist along the mouths of the major tributaries to the South Santiam River between Cascadia and Upper Soda. These areas are all under 1500' elevation and can be easily reached during most times of the year. During the winter these areas were likely used exclusively by Santiam Molalla, but they were also

Table 3. Santiam Molalla landmarks. Sampling of documentary photographs of named and unnamed landmarks within the study area.

	
<p>Tidbits Mountain view. E. Esselstyn</p>	<p>Cascadia Cave. K. Cribbs</p>
	
<p>Pine Rock. E. Esselstyn</p>	<p>Dobbin Creek waterfalls. B. Zybach</p>
	
<p>Wolf Rock. N. Lapham</p>	<p>Bear Pass. N. Lapham</p>

likely used as seasonal homesites and campgrounds by numerous other tribes during summer months, when the passes were snow free. These campgrounds were close to the river in strategic, protected locations at low elevations, with ready access to higher elevations as weather allowed.

Owl Creek-Swamp Mountain is a complex of meadows, marshes, orchards, and berry patches located along a series of benches, shoulders, knobs, and ridgelines. Owl Creek empties into Canyon Creek in an area that continues to be used as a campground to this time, and is low enough in elevation to be reached most of the year. Berries, cherries, redcedar, willow, and bigleaf maple are all abundant in the adjacent hills. Beargrass and pine are in higher elevations.

Bear Pass can be located on the landscape as immediately south of Twin Buttes, which are a prominent feature on the visible skyline. This major trail crossroads includes immediate access to headwater fields, prairies, meadows, and berry patches associated with the Tidbits Mountain, Two Girls Creek, Black Creek, Falls Creek (Gordon Meadows), Gordon Lakes, Twin Buttes, and Latiwi Mountain trail complex. Bear Pass is on the boundary between Santiam Molalla and Blue River Molalla lands, and formed a convenient entry to the South Santiam River basin from Fish Lake, Clear Lake, or Obsidian Cliffs. Camping areas can be found all through the area, with abundant food, freshwater and fuel.

Wolf Rock is an abrupt, iconic peak located strategically at the headwaters of Blue River, a relatively short distance from Tidbits Mountain, Deer Creek, Obsidian Cliffs, Bear Pass, or Latiwi Mountain. There is a relict meadow adjacent to Wolf Rock that appears to be a remnant of what had been an extensive prairie in the past. Major trail crossroads and intersections are located in conjunction with this landmark, and there is also a large pond nearby that is growing wokus.

Latiwi Mountain is the southwest corner of the divide separating Mann Creek (Blue River) from Deer Creek (McKenzie River), Sevenmile Creek (South Santiam River), and Browder Creek (Smith River). The divide between these four river drainages is relatively low in elevation, and the Sevenmile Creek basin, in particular, was likely a heavily used area by a number of tribes, including Cayuse, Northern Molalla, Warm Springs, Blue River Molalla, Klamath, Paiute and Kalapuyan, whose members visited or traveled through eastern Santiam Molalla lands in summer. This area was also known as a favored Indian hunting ground in early historical time (see Figure 1).

The Cascadia, South Santiam campground, and Owl Creek areas are all fairly low elevation and were accessible to Santiam Molalla year round. Wolf Rock, Bear Pass, and Latiwi Mountain are all higher elevation and could only be reached seasonally -- with Wolf Rock capable of being reached much earlier in the year by local Blue River Molalla than by snow-blocked Santiam Molalla to the north.

4. Primary Trail Network and Seasonal Use Patterns

Climate is a critical factor regarding human use and occupation within the study area. A majority of the trails, meadows, prairies, and berry patches are more than 3,000 or 4,000 feet in elevation (Appendix D) and are covered with snow for a significant portion of each year (Table 4; Appendix B). Heavy snows can begin in September, near the beginning of fall, and north-side ridgeline trails and prairies can be snowed in until June (personal observation) or even July (see Figures 1 and 2; Plummer 1903).

Year-round occupation. From all appearances, there have been sufficient resources within the study area to readily support a full-time population of several hundred people or more during the past several centuries. In addition to elk, deer, blue huckleberries, redcedar, beargrass, and other prized resources, the Santiam Pass is strategically located between the populations of eastern Oregon and western Oregon, and likely provided trading advantages at different times. Slave trade agreements with the Klamaths, for example (Ruby and Brown 1987; Zenk and Rigsby 1998), may have been an important factor as to where people lived and traveled at different times of the year. Molalla used snowshoes, but a major portion of the South Santiam River corridor is snow-free most of the year and would have been the most logical place for full-time residency.

All locations in the study area are less than 25 miles distance by trail from one another; meaning that, in the absence of snow, all locations that were used historically were within a day's travel or less from each other. This is an important feature for a pre-horse society that traveled almost entirely by foot, because the rivers and creeks are too steep and shallow, and the lakes and ponds are too small and isolated, for most canoes or other watercraft.

Seasonal occupation. Most of the study area is high elevation and inaccessible due to snow for much of the year (Table 4). Only the South Santiam River corridor of prairies and meadows are below 1500' elevation, and remain snow-free and habitable most of the year. There is strong archaeological evidence that higher elevation riparian areas and ridgelines were also heavily used for centuries and millennia before white contact, as weather permitted (Farquay, personal communication).

The mainstem South Santiam River and McKenzie River corridors leading from the Willamette Valley to the Santiam Pass were extremely strategic holdings for the Molalla during the summer months. The Klamath traded slaves, wokus, pine nuts, and other goods in heavily used north-south trails through these lands, and much trade and travel from western Oregon to eastern Oregon had to pass through long stretches of narrow, highly visible trails and steep, easily protected canyons to get through Molalla land.

Table 4. Relative elevations of key Santiam Molalla locations.

Location	Elev.	River Basin	Destination Description
Cascadia	0750'	South Santiam	Possible townsite
Canyon Creek	0900'	South Santiam	Available riverine campground
Moose Creek	1,000'	South Santiam	Available riverine campground
Falls Creek	1,100'	South Santiam	Available riverine campground
Trout Creek	1,250'	South Santiam	Available riverine campground
Owl Creek	1,600'	South Santiam	Seasonal subbasin campground
Soda Fork	1,600'	South Santiam	Seasonal riverine campground
Cook Creek	1,800'	Blue	Seasonal riverine campground
Quentin Creek	2,200'	Blue	Seasonal riverine campground
Wolf Creek	2,600'	Blue	Seasonal riverine campground
Bunchgrass Mountain	3,600'	McKenzie	Seasonal ridgeline campground
Indian Creek	3,600'	McKenzie	Seasonal subbasin campground
Two Girls Pond	3,600'	South Santiam	Seasonal subbasin campground
Wildcat Mountain	3,600'	Smith	Seasonal crossroads campground
Wolf Pond	3,600'	Blue	Seasonal subbasin campground
Gordon Lake	3,800'	South Santiam	Seasonal subbasin campground
Gordon Meadows	4,000	South Santiam	Seasonal ridgeline campground
Bear Pass	4,200'	Blue	Seasonal crossroads campground
Tombstone Pass	4,200'	McKenzie	Seasonal trail pass
Swamp Mountain	4,300	South Santiam	Seasonal ridgeline campground
Latiwi Mountain	4,300'	South Santiam	Seasonal ridgeline campground
Tidbits Mountain	4,300'	South Santiam	Seasonal crossroads campground
Browder Ridge	5,100	Smith	Seasonal ridgeline campground

The South Santiam River corridor is the only part of the study area likely to have had permanent Santiam Molalla residency. Wolf Rock was far more likely to have been used and visited by Blue River Molalla during the course of a year, but Tidbits Mountain, Bear Pass, and Latiwi Mountain were likely used by Santiam Molalla and Blue River Molalla during the same periods of time.

Molallan and/or Kalapuyan townsites and/or major campgrounds were likely (theoretically) located to the immediate south and west of the study area in the present-day locations of Foster, Sweet Home, Waterloo, Lebanon, Sodaville, Brownsville, Crawfordville, Holley, and Blue River, and these locations would most likely have hosted the major trade markets and influxes of seasonal visitors prior to 1850.

Primary travel and trade routes (1) intersect at these (Table 4) principal land use locations within the study area, and radiate outward from these locales via (2) secondary foot-trail networks to favored camping sites, fishing spots, hunting

blinds, and resource gathering areas. Short cuts, isolated resources, spiritual locations, and other irregularly-used trail segments (3) constitute a third type of trail network pattern used by Santiam Molalla in South Santiam River and Blue River basins. A fourth, far more ephemeral, type of trail use results from the (4) integration of existing human and animal trails during times of emergency, hunting, battle, or other episodic occurrences. The focus of this study is strictly primary routes, but from that foundation it is a fairly straightforward process to determine secondary and other types of patterned trail use.

Map 5 and Appendix B list and name the 32 Santiam Molalla foot-trail segments that are a partial result of this research. These segments have been entered into the Grand Ronde GIS mapping system, and can now be used for Tribal research, educational, recreational, and cultural purposes. These trail segments are described in further detail in the following pages and should be accepted as both accurate and open to further review at this time.

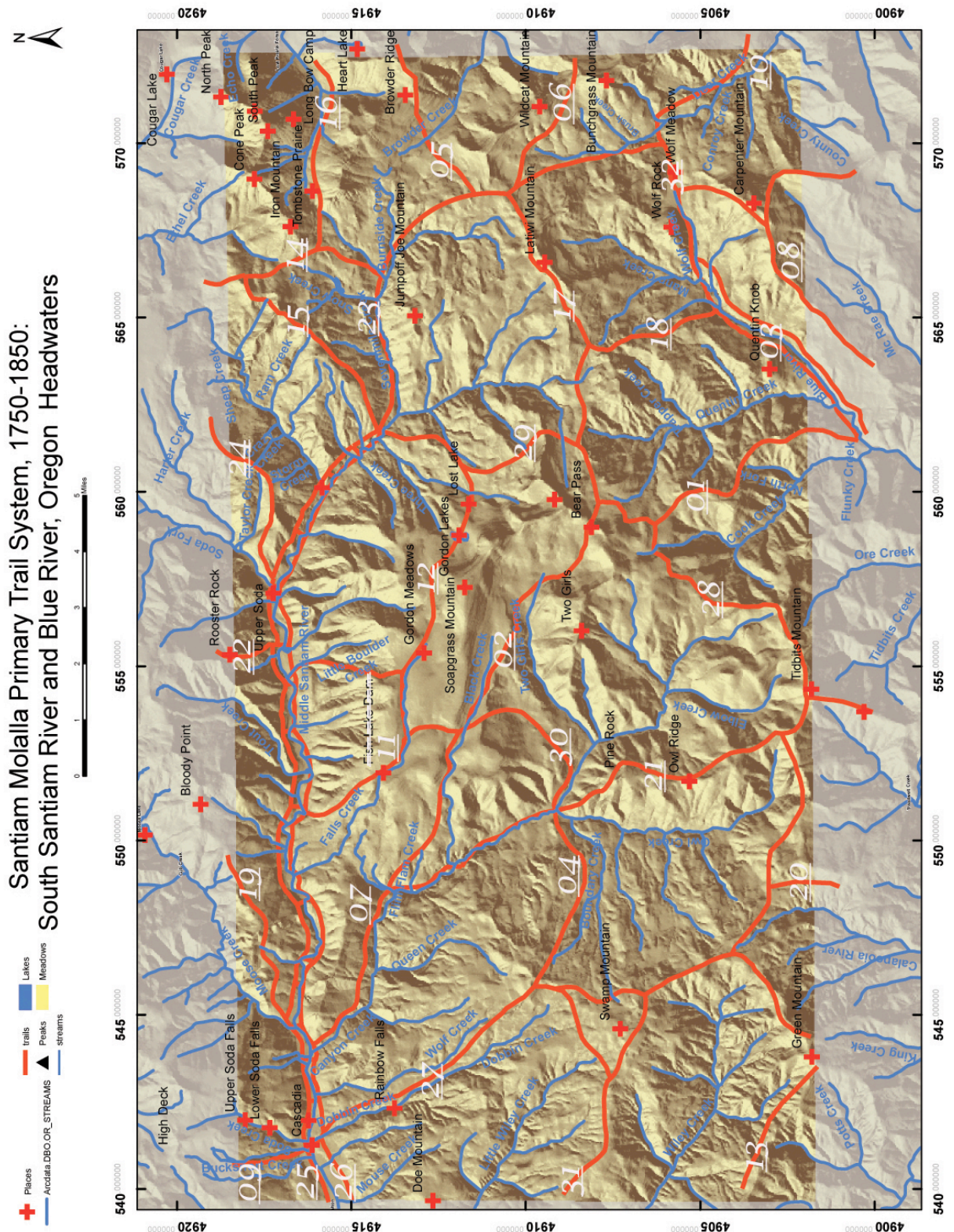
Bear Pass Trail (01) begins near the mouth of Quentin Creek on the Blue River Trail and goes northwest, up the ridgeline between Quentin Creek and Cook Creek, until it reaches Bear Pass. Blue River Molalla would have used this trail whenever the Pass was cleared of snow. Bear Pass is a strategic location with campgrounds and trails that go in all directions from there.

Black Creek Trail (02) begins near the mouth of Black Creek, a tributary of Canyon Creek, and proceeds easterly along the Creek's banks to its headwaters, and from there southeasterly to the headwaters of Two Girls Creek, and then to Bear Pass. Santiam Molalla would have used this trail for hunting, gathering beargrass and willow, and picking berries. When the snow cleared, this trail could also be used for reaching Bear Pass.

Blue River Trail (03) begins about three miles above the mouth of Blue River, at its juncture with the McKenzie River, and travels along its banks until it reaches the River's beginning point, near the base of Wolf Rock at the juncture of Wolf Creek and Mann Creek. This trail would have been used by Blue River Molalla through much of the year for traveling, hunting, and fishing. Wolf Rock is a strategic location with campgrounds and trails that go in all directions.

Boundary Creek Trail (04) begins near the mouth of Owl Creek, near its junction with Canyon Creek, and travels westerly, up Boundary Creek's northern ridgeline, to Swamp Mountain. Santiam Molalla would have used this trail as snows melted, to reach the hunting opportunities, fruits, berries, and weaving materials found in the higher elevations of Swamp Mountain. Both the mouth of Owl Creek and Swamp Mountain are additional strategic locations with campgrounds and trails that go in all directions.

Map 5. Index map of 32 named Santiam Molalla primary foot-trail segments.



Browder Ridge Trail (05) begins at the divide near Latiwi Mountain, between Smith River, Blue River, and South Santiam River. This location gives all the appearances of a major seasonal trading and hunting location for a number of Tribes, including Northern Molalla, Santiam Molalla, Blue River Molalla, Klamath, and possibly Paiute, Kalapuyan, Cayuse, and Klickitats as well. In the early 1900s, Warm Springs families were known to graze their horses near this location, and may well have arrived via Browder Ridge. From Latiwi Mountain divide the trail follows Burnside Creek north to the base of Browder Ridge, then makes a steep ascent to the ridge's summit, where the trail extends for miles to the east along a fairly level surface. During the summer, this trail provided a safe and rapid entrance and exit to the eastern lands of the Blue River Molalla and Santiam Molalla. The various listed Tribes also likely used it for hunting and gathering purposes.

Bunchgrass Mountain Trail (06) begins at the Latiwi Mountain divide (see description on Browder Ridge Trail narrative), then travels southeasterly between Wildcat Mountain and Bunchgrass Mountain to Smith River. This trail directly connected to the north-south Klamath Trail from Clear Lake to Fish Lake to Big Meadows, and was likely used by Klamath, Paiute, and Blue River Molalla to raid, visit, trade, or hunt with the Santiam Molalla.

Canyon Creek Trail (07) begins near the mouth of Canyon Creek, and then follows flats and ledges southeasterly, along the eastern side of the Creek, until it reaches the mouth of Owl Creek. Original field observations and a USFS Geologist (Shank 2007, personal communication) opined that the walls of the canyon were too steep to allow regular foot traffic, but Farque (personal communications, 2007) contends that significant archaeological finds are located along this reach. Early maps (Metsker 1938) also show a well used trail in this location, so it was decided to include this segment as Farque suggests. GPS readings were not taken the entire length because the road was closed due to a massive slide during field research (Anonymous 2007). Easier, less dangerous routes also go from the South Santiam to the mouth of Owl Creek, but they are longer distances and more difficult to monitor.

Carpenter Mountain Trail (08) begins near the mouth of Lookout Creek, where it enters Blue River, and ends near the summit of Carpenter Mountain, to the northeast. It is a ridgeline trail that parallels the southern bank of the Blue River. Blue River Molalla may have used this trail, and perhaps Calapooia Kalapuyans, after snows had melted. This trail may have been used as an important east-west trade route, connecting Klamath and Paiute traders with Obsidian Cliffs and Willamette Valley Kalapuyan markets. This segment was not ground-truthed, however, and may be of lesser importance than current speculation.

Cascadia North Trail (09) can be said to begin at the local renowned Soda Spring (Carey and Hainline 1979), or from Cascadia Cave (McClary 2007; Morgan 2007). This is a key feature of a large area that may have been a year-round townsite for Santiam Molalla and their predecessors on the land. The elevation is under one thousand feet; abundant fuel and freshwater exists all year; it is a key and strategic access point connecting a major eastern and western Oregon trade route; abundant bulbs, seeds, nuts, roots, and berries are found in summer and fall, and fish and game can be readily obtained in winter and spring. From Soda Spring the trail trends up the western bank of Camp Creek (local residents claim this is the historical Bucksnot Creek, and want the name changed back, according to R. Lennen and R. Jones, personal communication, September 17, 2007), until it reaches a low saddle in the nearest ridgeline. From there the trail readily connects to Moose Ridge, and can be taken to several different locations within the Middle Santiam basin. This area is networked with potential trail alignments, and provides indications of widespread use in past times. The selection of this one segment is a generalized and largely symbolic choice that likely represents at least two or three primary trail routes heading north from Cascadia in the late 1700s and early 1800s. In earlier times, traffic was likely much greater.

Deer Creek Trail (10) begins near the mouth of Deer Creek, where it enters the McKenzie River, and continues north along the Creek's banks, to Latiwi Mountain divide (see description on Browder Ridge Trail narrative). This Trail would have been used by Blue River Molalla following snowmelt, and by Klamath traders and visitors, headed toward Wolf Rock, Latiwi Mountain, or Bear Pass. It also would have been used for fishing and hunting, and likely for gathering as well.

Falls Creek Trail (11) begins upstream of the mouth of Falls Creek, near Long Bow, at an intersection with south Santiam South Trail, and travels south, up the ridge to Falls Creek; from there the trail proceeds along the banks of the creek to Gordon Meadows, where it forks east to Gordon Lakes Trail, and south to Black Creek Trail. Santiam Molalla and their guests, based at Cascadia or Long Bow campground, were likely the near-exclusive users of this trail. It was likely more of a trail for gathering and transporting produce (particularly camas, huckleberries, other berries, and bear grass) and for hunting elk and deer, rather than for trade or general travel purposes.

Gordon Lakes Trail (12) is an upland southern loop trail that connects an important South Santiam River crossroads with an important campground downstream, via a ridgeline loop that includes several miles of hunting, fishing, and food, fuel, and fiber gathering opportunities. This trail begins near the juncture of Latiwi, Sevenmile, and Three creeks and travels southerly, along the ridgeline between Three Creek and Latiwi Creek. From there, the trail turned

west along a side-ridge, crossed Three Creek, continued northwesterly to the south of Lost Lake, between the two Gordon Lakes, to Gordon Meadows, and then north and downhill, along the western ridgeline of Little Boulder Creek, ending at the South Santiam River campground between the mouths of Boulder and Little Boulder creeks. This trail was predominantly a resource use trail, but was more likely to be used by Blue River Molalla and Klamath than the Swamp Mountain, Canyon Creek, or Falls Creek routes to Gordon Lakes and Gordon Meadows, which were likely used almost exclusively by Santiam Molalla.

Green Mountain Trail (13) is largely conjectural at this time because it is on private land and is blocked from travel by fallen trees and locked gates at this time. In addition to lack of field access, the sets of historical aerial photos we used did not go this far south, and the GLO township map (for unknown reasons: see Part 2) did not include trails or forest roads of any sort for this area. At the least, this trail was used for hunting, gathering, and visiting the neighbors; at most, it was a seasonal trail used regularly by Santiam Kalapuya, Calapooia Kalapuya, Blue River Molalla, and possibly Klamath and Santiam Molalla, to travel from the Willamette Valley to Tidbits Mountain, Latiwi Mountain, Fish Lake, Wolf Rock, or Obsidian Cliffs. This segment starts on the western boundary of the study area, at a location along Green Mountain Ridge named Happy Camp (according to a 1938 Metsker), and proceeds easterly along the ridgeline and to the south of Green Mountain peak, to the equally conjectural “Crossroads Camp” near the beginning point of the North Fork Calapooia River. Crossroads Camp is also on the ridgeline trail to either Swamp Mountain to the north, or Tidbits Mountain (and Bear Pass) to the east.

Harter Mountain East (14) and West (15) Trails are the two finalists for a “principal northern route” between the South Santiam River, Latiwi Mountain, and the complex of meadows, wetlands, and prairies, of the Harter Mountain area. The Soda Fork Trail also has Harter Mountain as an initial destination. The Soda Fork Trail was likely to be used almost exclusively by Santiam Molalla, and perhaps Santiam Kalapuya, but the Harter Mountain Trail (both East and West) was just as likely to be used by Blue River Molalla and Klamath. The eastern route begins near the mouth of Burnside Creek, while the western route begins near the mouth of Latiwi Creek; both intersect to the northwest of Iron Mountain.

Indian Prairie Trail (16) derives its name from the original historical name for Tombstone Prairie (Plummer 1901; 1903). This trail follows the eastern Harter Mountain route (Trail #15) from the mouth of Burnside Creek, but turns due east through Tombstone Pass, and then follows Hackleman Creek to its juncture with Smith River, and then on to Fish Lake. This trail may have been used less than the Browder Ridge Trail to Fish Lake, and more seasonally than the Sevenmile Creek Trail to Fish Lake; and it may likely have been used more

for hunting and fishing purposes than for travel or trade, although it is the principal alignment for Highway 20 at this time. Santiam Molalla, Blue River Molalla, Klamath, and perhaps Warm Springs, Cayuse, Paiute, and Kalapuyans, regularly used this trail on a seasonal basis.

Latiwi Mountain Trail (17) is the best and earliest documented segment of this trail network (see Part 2). It is shown as “Wiley’s Trail” on the 1895 GLO map of Tsp. 14 S., Rng 5 E. (Hammond 1895), denoting Andrew Wiley’s 1860s stock trail from the Willamette Valley to eastern Oregon via the “Santiam Pass.” Wiley pioneered the popular stock trail and toll road by “following an Indian trail over the mountains” in 1859 (Carey and Hainline 1979: 10-12), before becoming hopelessly lost and ending up at (and naming for that reason) Lost Prairie, on Hackleman Creek. It has been said that because Wiley got lost, Highway 20 today follows Hackleman Creek instead of lower-elevation Sevenmile Creek (see Sevenmile Creek Trail), as the Molalla and Klamath did. This trail begins at Bear Pass, and follows the ridgeline eastward to the north side of Latiwi Mountain, ending on the four-river (Blue, McKenzie, Smith, and South Santiam rivers) divide to the northeast of the peak. This trail is covered with snow most of the year, and the ridgeline it follows formed a nearly impassable barrier to Blue River Molalla and Santiam Molalla during that time. Following snowmelt, the trail appears to have been used extensively for travel, trade, hunting, and gathering by Santiam Molalla, Blue River Molalla, Klamath, and perhaps Paiutes, Cayuse, Warm Springs, and Kalapuyans.

Mann Creek Trail (18) begins along the Blue River Trail, near the juncture of Mann Creek, Wolf Creek, and Blue River, southwest of Wolf Rock, and proceeds northerly, along the ridgeline between Mann Creek and Trapper Creek, to an intersection with Latiwi Mountain Trail, in Tsp. 14 S., Rng. 5 E., Sec. 14. This trail would be used seasonally by the Blue River Molalla to travel to Bear Pass or Latiwi Mountain. Klamath and Santiam Molalla, and perhaps Kalapuyans and Paiutes also likely used it, seasonally. It is possible that it was merely a trail of seasonal convenience, or it may have been an important link in the slave or obsidian trades. A significant amount of thimbleberries grows along this route.

Moose Mountain Trail (19) begins east of the mouth of Moose Creek, at an intersection with the South Santiam North Trail, and proceeds northeasterly to Moose Mountain, which is strategically located in the Middle Santiam River basin to travel rapidly in several directions by ridgeline routes. It appears to be a major travel route for Santiam Molallans living or visiting near Cascadia, connecting with the lands and people of the Middle Santiam and North Santiam rivers. This may have also been an important north-south link for seasonal Klamath trading parties and/or Kalapuyans visiting from the Willamette Valley. [As a side note, “Moose” is a prominent name in the locality, being given to a large creek, a mountain, a ridge, trails, roads, and an alpine lake, yet the name is

a mystery. No moose have ever lived anywhere near these places, and no locally prominent family or character can be located with that name. One guess is that the name is a corruption of “moosmoos,” said to be the local Indian name for immigrant cattle (Carey and Hainline 1979: 7)].

North Fork Calapooia Trail (20) begins at the juncture of the North Fork Calapooia River with the Calapooia River, and proceeds north, cross-country along the river’s bank and following benches and ridgelines, to a small lake or pond at the river’s source: hypothetical “Crossroad’s Camp.” This trail was likely used seasonally by Calapooia Kalapuyans, Blue River Molalla, and Santiam Molalla on minor north-south visitations, or as access to Bear Pass and Latiwi Mountain trade networks involving Klamath, possibly Paiutes, and other Molallans and Kalapuyans.

Owl Ridge Trail (21) begins at the mouth of Owl Ridge and travels southerly to an intersection with the Tidbits Mountain Trail, near the peak. This trail was mostly likely used by Santiam Molalla and guests as weather permitted, until opened to regular traffic with Blue River Molalla and Calapooia Kalapuyans following snow melt. This is mainly a travel, hunting, and gathering route.

Rooster Rock Trail (22) begins at an intersection of the South Santiam North Trail, across the river from the mouth of Boulder Creek, and proceeds nearly due north and nearly straight uphill to Moose Mountain. This trail aligns closely with the north-south Falls Creek Trail route and creates a very short (but physically taxing) distance between the strategic Moose Mountain and Bear Pass trail networks. This trail was likely mostly used by Santiam Molalla and Blue River Molalla on a seasonal basis, and may have seen most use packing meat, hides, and berries downhill, as emergency escape routes, or for strategic communications or travel purposes. It is also possible that the trail was of minor importance, and mostly used by elk, deer, and hunters.

Sevenmile Creek Trail (23) begins at the crossroads near the mouth of Latiwi Creek, and then proceeds southeasterly, down the north side of Sevenmile Creek, until it reaches Latiwi Mountain divide (see Latiwi Mountain Trail). This trail was likely heavily used during the summer months by numerous tribes in the region, traveling both on east-west and north-south routes.

Soda Fork Trail (24) begins at an intersection with the South Santiam North Trail at Upper Soda, then follows Soda Fork to Harter Creek ridgeline, ending at Harter Mountain, an area characterized by numerous wetlands, grasslands, and bottomlands ideal for hunting, camping, and food and fiber gathering and processing. Upper Soda is the most eastern of the series of seasonal campgrounds located along the South Santiam River above Cascadia and would have most likely been used predominantly by Santiam Molalla.

South Santiam North (25) and South (26) Trails begin in Cascadia and travel parallel easterly paths along the north and south banks of the South Santiam River, to their intersection near the mouth of Latiwi Creek. These trails connect Cascadia with the upstream riverine meadows and campgrounds and would have likely been used year-round by Santiam Molalla, and by a steady stream of Kalapuyans, Paiute, Klamath, and others during the summer months.

Swamp Mountain Trail (27) begins near the mouth of Dobbins Creek along the South Santiam South Trail and travels by ridgeline to the south of Swamp Mountain. It was likely the most common route to use from Cascadia to Swamp Mountain, and possibly the most common way to reach Owl Creek, via Boundary Creek Trail, as well, Principal users would have been Santiam Molalla, with Blue River Molalla and Calapooia Kalapuyan visitors to Cascadia and points north the most likely users during summer. This would have likely been more important as a primary hunting and gathering route, rather than as a travel or trade trail.

Tidbits Mountain Trail (28) begins at Bear Pass and goes to Tidbits Mountain, as weather permits. It is the best documented “Old Indian Trail” (see map 1) in the study area and has old-growth trees and numerous relict huckleberry fields and beargrass meadows that are centuries old and diminishing in size. A number of freshwater sources and potential camping areas also exist at the beginning and ending points of this trail. This trail was likely used by Blue River Molalla and Santiam Molalla as soon as it opened in the late spring or early summer, and was also likely used by a wide range of neighbors, traders, visitors, and travelers throughout the summer.

Twin Buttes Trail (29) begins near the major crossroads (and likely seasonal campground) near the mouth of Latiwi Creek, travels southward along the Three Creek ridgeline, until Bear Pass is reached. An intersection with the Gordon Lakes Trail (see above) loop likely varied in location from time to time, due to multiple options at this location. This trail was likely used seasonally by both Santiam Molalla and Blue River Molalla and their guests.

Two Girls Creek Trail (30) was likely one of the principal routes to Gordon Meadows and to Bear Pass from the mouth of Owl Creek. After following the northern side of Two Girls Creek for some distance, the trail traveled cross-country – apparently by a braided variety of routes – to connect with Black Creek Trail and the upper Two Sisters basin. This trail was likely used almost entirely by Santiam Molalla and their guests, and was more likely used for gathering and food and fiber processing purposes, rather than trade, travel, or hunting.

Wiley Creek Trail (31) probably started near the forks of the Middle Santiam River and the South Santiam River near present-day Foster, and continued up the Wiley Creek ridgeline until a fork near the summit of Swamp Mountain. The north fork went to the Boundary Creek Trail and Owl Creek, and the south fork went to “Crossroads Camp” (Appendix A) and Tidbits Mountain. This appears to be the principal Santiam Molalla and Santiam Kalapuyan upland route into Swamp Mountain from the west (other than the South Santiam River trails), and the Foster location near the mouth of Wiley Creek was likely a Molallan (or possibly Kalapuyan) townsite or major campground. This trail may have also been the primary trail used by people further downstream, from an historical Molalla townsite of “Klamath-type” homes (Carey and Hainline 1979: 7) near the mouth of Ames Creek in present-day Sweet Home.

Wolf Rock Trail (32) leads from Obsidian Cliffs on a seasonal cross-country route to Wolf Rock (Table 3 and 8, Appendix A), an obvious landmark, a major camping location, and a crossroads to several different trading locations to the north and west. There is also a relict meadow and at least one large pond with wokus at Wolf Rock, which is about a one day’s hike from Obsidian Cliffs, and another day’s hike to the Willamette Valley.

These descriptions of the 1750-1850 Santiam Molalla trail network are listed in Appendix B, shown on Map 5, field documented with photographs from the GPS locations listed in Appendix D, and are entered into the Grand Ronde computerized GIS mapping system as linear files for further uses. Their location and documentation was the principal focus of this project, and these listed products are the primary outcomes.

5. Cultural Plant Use and Management







The Kalapuyans of the Willamette Valley lowlands are closely associated with the management, harvesting, processing, and trading of at least three major plants: camas, tarweed, and white oak. The Klamaths are just as closely associated with sugar pine, yellow pine, and wokus, and the Athapaskans of southwest Oregon traded prized black oak, tanoak, and manzanita products.

Based on the evidence gained by this research – including archaeological, anthropological, botanical, historical, and eyewitness evidence – the Santiam Molallans can be closely associated with blue huckleberries, beargrass, and blackberries. They may have also been an important source of thimbleberry, blue elderberry, bracken fern, redcedar, chittum, bigleaf maple, and/or Indian hellebore products to adjacent tribes, based on the potential trading value of these crops, and on their current and persistent widespread occurrence.

A primary purpose of field research and documentation was to test the theories of ridgeline and riparian trail use that is the basis of this project (Part 2). If the theories proved correct, then a significant number of precontact and early historical cultural artifacts should reasonably be expected to be found in linear patterns of nodes closely approximating destination points (Part 3) and their linear, connective access routes (Part 4). The artifacts of most interest were the relict fields and meadows of berries, bulbs, weaving materials, and other beneficial plants most likely used by Santiam Molalla during the 1750-1850 study period. Assessments of these plants were made at each GPS reference point (Appendix D), and photographs were used to document flowers, fruits, nuts, and other features of cultural value on the days and at the elevations they were found.

Plant Names are those given by the field survey crews, often following discussion and consultation with one another. These names (along with a few minor notations of other plants in the daily forms or informal notes) are almost precisely the same as those found by Winkler (1984: Appendix) in her study of the Molallans in the Middle Fork Willamette and McKenzie river basins. Appendix C has a more complete, but not comprehensive, listing of cultural plants documented during this project (a more comprehensive listing is in the Excel database in conjunction with their GPS reference points). Cultural plants were treated as artifacts in nearly the same sense as obsidian blades or mortars and pestles, and were used to test the basic theoretical assumptions of this project. No attempt was made to be comprehensive in such listings (the photographs better serve that purpose), and most rare and endangered plants were disregarded for purposes of this survey.

Table 5. Typical Santiam Molalla plant products.

	
Blue huckleberries. N. Lapham	Blue elderberries. N. Lapham
	
Old-growth conifer. S. Brown	One-inch camas bulbs. B. Zybach
	
Wokas. E. Esselstyn	Beargrass blossoms. B. Zybach

Latin names (see Appendix C) are not given for all inventoried plant species for a number of reasons: 1) not all species have been correctly identified, and documentary photographs and precise field measures can be used to resolve these errors, if need be, at some future time; 2) Winkler (1984: Appendix) cites the authoritative Hitchcock for a complete listing of Latin names as they existed at that time, and for all of the plants listed in Appendix C; 3) the various species of willow, huckleberry, and ribes are so varied and intermingled that even expert taxonomists can't agree on some plants; and 4) mostly because Latin name identification for these species is not directly relevant to this study.

Food. There are a significant and widespread variety of edible seeds, nuts, and berries that ripen at most aspects and elevations throughout the entire summer. There are also significant fields and meadows of roots and bulbs in the study area that have good food value and were likely harvested in the spring and fall. Most food plants occurred at virtually every elevation, but prized blue huckleberry, beargrass, and Indian hellebore crops were only documented at sites above 3,000 feet elevation (Table 6). Most areas of human food production have become noticeably smaller in the past 50 years, and appear to have been diminishing in size for several centuries. Huckleberry fields, beargrass meadows, strawberry patches, ridgeline grasslands, and brakes all appear to be much smaller today than during the 1750 to 1850 time period and, in turn, were apparently much smaller during that time than during the 1500 to 1650 time period. This decline in area is largely marked, and caused, by the encroachment of conifer trees into areas previously kept free of trees via regular burning and tillage, and is documented by eyewitness accounts, aerial photographs, and land survey records.

Basketweaving. Large amounts of commercial-grade weaving materials, particularly willow and redcedar, could be found at all elevations, but beargrass could only be obtained above the 3,000 foot level. Other local plants likely used and traded by Santiam Molalla for weaving purposes include bigleaf maple, hazel, flags (wild iris), carex, and bunchgrass. Beargrass was particularly prized as a trade item, but willow baskets or other manufactured goods may have been of greater or equal importance at times.

Fuel. Woody fuels can be readily found within several minutes walk in almost every part of the study area, and the Santiam Molalla likely had no trouble finding or stockpiling fuel near residences and camping areas.

Other Plant Products. Little attempt was made to inventory or document plants typically used by Santiam Molalla for medicines, dyes, musical instruments, weapons, or other purposes. This was for two reasons: 1) these plants are not usually represented in the broad landscape-scale patterns of this study; and 2) they are outside the author's area of expertise.

Table 6. Relative elevations of principal Santiam Molalla cultural plants.

Plant Name	Type	Lowest	Highest	Product
1) Oak	Tree	0800	1600 (?)	Food, fuel
2) Camas	Bulb	0800	4000	Food
3) Willow	Shrub	0800	4200	Fiber, medicine
4) Blackberry	Vine	0800	4500	Food, dye
5) Bracken	Fern	0800	4500	Food, fiber
6) Thimbleberry	Shrub	0800	4500	Food, fiber
7) Beargrass	Bulb	3100	4700	Food, weaving
8) Wokas	Bulb	3300	4100	Food
9) Indian hellebore	Bulb	4100	4800	Medicine, poison
10) Blue huckleberry	Shrub	4200	4700	Food

Table 6 lists key plants of special interest to this study. Plants found in the lowest elevations (under 1200 feet, or so) were accessible during most of the year, and seasonally at higher elevations, but may only bear fruit or other desired products during a relative short period of time. Plants in the highest elevations (above 3000 feet elevation) can only be reached as snow permits, and typically ripen or otherwise mature during the summer months of June to September and had to be harvested during those months (as opposed to wapato or camas, as examples, that could be harvested at lower elevations most of the year). This list is arranged by documented elevation ranges that were recorded incidental to plant locations during the course of this project. These ranges are not comprehensive by any standard or intent, but provide a good idea as to the seasonal locations and activities of Santiam and Blue River Molalla, and the specific trails that were used to reach these places, why, and when.

Low Elevation plants are those that were found only at lower elevations during field research, or that had been most commonly harvested in large quantities at lower elevations during early historical time.

1) **White Oak (and tarweed and wapato)** are important for their absence. These three plants were of major importance to the Kalapuyans of the Willamette Valley to the immediate west of the Santiam Molalla, and white oak and tarweed occur in abundance in the western part of Molallan lands in the Foster-Sweet Home area; white oak and tarweed were also present in abundance in the Blue River Molalla lands surveyed by Winkler (1984) on federal lands in the Middle Fork Willamette River basin. Although it is entirely possible that tarweed is present in the study area (wild sunflower, often harvested in conjunction with tarweed, was noted and photographed), it is often difficult to notice in daylight when its flowers close, and it may have been missed. Oak was searched for diligently, but only a single patch of scrub-oak was documented, on

the extreme western boundary of the study area, on the north bluff above the South Santiam River. Huge savannah oak trees exist to the immediate west, a few miles away. According to a long-time resident and professional firewood cutter, who directed us to the trees in the first place, there were no other oak to be found within the study boundaries, and he was firm on that point (R. Jones, personal communication, September 17, 2007). The question mark on the 1600' elevation entry for oak is because of an entry made by one of the researchers showing an oak grove (see Appendix D), but it appears the picture was taken well west of the study area in order to get a landscape profile of the western boundary.

2) Camas. An August 3, 2006 newspaper photograph of camas in full bloom in Gordon Meadow at 4,000 feet elevation was the beginning point of this project (Paul 2006) but, despite the fact the study area is about 130,000 acres in size, little or no other camas was found at any elevation. And why was camas being raised at that elevation in the first place? Most of the great camas fields of the Kalapuyans were in lowlands and wetlands, not high elevation meadows, and were a lot larger in size and a lot more accessible for a much longer portion of the year. One problem may have been timing. Camas dries up quickly and is very hard to spot once it is out of bloom. Field research was conducted in August and September, well after even the highest elevation camas had completed blooming. A few camas were noted along the banks of the South Santiam River in the Cascadia to Trout Creek corridor, and these appear to be relict of former fields or large patches. Leslie Haskin noted in 1934:

Of all the food plants used by the Western Indians the camas was the most important and widely known. There is more romance and adventure clustered around the camas root and flower than about almost any other American plant. (Haskin 1934: 29-30)

Ubiquitous Plants are the plants that were commonly found almost everywhere, at every elevation and aspect, wherever trail alignments were documented.

3) Willow was used for a number of products, but particular varieties managed in certain ways were particularly valuable for weaving purposes (Anderson 2005). "Indian willow baskets" have maintained commercial and utilitarian value for all of Oregon's (and Washington's) history, for example, and it appears that some of the willow along Two Sisters, Black, and Falls creeks, may be suitable for that purpose. Other willow was used as medicine, food (cambium bark layer and shoots), construction materials, and fuel.

4) Blackberries will grow anywhere there is a recent disturbance – a new road shoulder, fresh logging, a slide, or a recent fire. It spreads everywhere it has an

opportunity, and native blackberries (see Appendix C) were found virtually everywhere plots were taken throughout the entire study area. Blackberries are also somewhat ephemeral, and tend to disappear quickly from the landscape when shaded out by conifer trees or other heavy shade; as a result, it is almost impossible to tell where old fields or patches may have been 200 years ago. On the other hand, it is possible that blackberries were managed as a crop that moved across the landscape, following burns, as conditions changed. The importance of berry-picking to the Molalla must be emphasized. As Winkler has noted:

The importance to Molala subsistence of both hunting and berry-picking is reinforced by the fact that all published references to Molala subsistence mention either or both of these activities . . . (Winkler 1984: 5).

5) Bracken Fern was heavily used by Oregon Coast Range Indians for food and starch from the roots, and greens from the shoots. Heavy bracken fern prairies, or “brakes,” ascended a large number of Coast Range ridgelines, and were likely burned and tilled annually. Burning bracken fern is different than grasslands, though, in that it is best as fuel in winter or early spring, rather than late spring or summer, when it is virtually fireproof (Zybach 2003). Grasslands tended to be burned in late summer or fall, after they had dried. Bracken fern, like blackberries, spreads quickly and easily to new disturbances. However, unlike blackberries, it can be cultivated into almost pure stands of highly productive food plants that can persist for decades, and possibly centuries, with little or no additional management effort. In that regard, ancient bracken fern prairies can often be identified, and relict patches can still be found.

Dickson (1946: 66) describes bracken fern use specific to the Molalla:

When the young fronds of the Brake fern first shoot out from the ground, they are very tender and have been eaten like asparagus. In fact, the young shoots of the Brake fern were roasted in the ashes by the Molala Indians. Then, they ate these shoots after they were cooked tender just as we eat asparagus today.

6) Thimbleberry was documented almost everywhere, much like blackberry and bracken fern. However, also much like bracken fern, there appeared to be relict patches of this plant that were remnants of what had been much larger fields at one time. This phenomenon was first noted along the Latiwi Mountain Trail, at the intersection with Mann Creek Trail. A solid ridgeline of thimbleberry was competing with a conifer plantation, successfully in patches, but was only three or four feet in height, and it was impossible to tell if there had been significant berry production this year, or not. Haskin (1934: 172)

noted: “[b]oth the berries and tender early shoots [of thimbleberry] were eaten by the Indians,” so perhaps berry production was not their principal value.

High Elevation Plants were those that were found only above 3000’ elevation, and were not otherwise generally observed at lower elevations. These plants appear to be among the most prized of the Santiam Molalla, and with the greatest market potential.

7) **Beargrass** is found in abundance in several high elevation meadows along Black Creek, a major drainage of Soapgrass Mountain, between Gordon Meadows and Gordon Lakes. “Soapgrass” is an older name for beargrass (Haskin 1934: 43), as were “elk grass,” “squaw grass,” and even “squaw tit” (for the appearance of its blossom); all names that also appear across the landscape of western Oregon. Haskin writes:

The name squaw grass comes, of course, from its use in basketry, but its true aboriginal name, current among the Indians of the Columbia Rapids where a large trade in the prepared leaves was carried on, was *quip-quip*. (Haskin 1934: 43)

Haskin quoted David Douglas’ ca. 1825 observations at length, and also noted the same coincidence of beargrass and obsidian observed during this research (D. Lewis and T. Farque, personal communications, September 8, 2007), when he wrote in 1934:

One day while skirting a large field of this grass on a high, inaccessible peak, I was surprised to notice unmistakable evidence of an Indian encampment. Over the ground, everywhere, were scattered chips of obsidian, with here and there an imperfect arrow. How did these come here, and why did the ancient people choose this inconvenient spot, far from water [Not likely. BZ], for setting up their camp? The answer is very simple; they came to gather squaw grass leaves, which were much used, and were an article of extensive commerce throughout the West long before the whites ever came to this coast. From the leaves the natives constructed hats, pouches, cups, baskets, and even water-tight cooking vessels. “Their baskets,” writes David Douglas, “were formed of cedar bark and bear grass so closely interwoven with the fingers that they are water-tight without the use of gum or rosin; some of them are highly ornamented with strands of bear grass which they dye of several colors, and interwoven in a great variety of figures; this serves them the double purpose of holding their water, or wearing on their heads.” (Haskin 1934: 41-43)

8) Wokas. This yellow water lily (Haskin 1934: 95-97) was an unexpected find when first observed in the small lake at the base of Bear Pass (see Table 3). According to Ruby and Brown (1986: 137): “From the Molalas the Klamaths obtained elk-horn spoons in exchange for the *wocus* lily roots of the Klamath Marsh.” The Klamaths were also reputed, according to many sources, to have sown plants of their native land along the great trade routes they established in western Oregon and northern California. That is one popular explanation for the strips of yellow pine that used to exist in the Willamette Valley and still occur in the western Cascades, for example. If this story is true, then it stands to reason that the Klamaths’ most treasured plant, the wokas, might be distributed in much the same way, at favored ponds and camping spots. Wokas was documented at Bear Pass and at Wolf Rock, and a stand of yellow pine was found at Swamp Mountain (but no pine seems to remain at Pine Rock, on Owl Ridge; see Table 3); is it possible that these were homeland plants of the Klamath, who were well known to the Molalla, and often visited their lands?

9) Indian hellebore is a highly poisonous plant known to cause deformities in calves and sheep. It grows more than 5-feet tall in wet prairies, woodlands and meadows and is a member of the lily family. A former USFS employee recounted a “prairie restoration” project in Gordon Meadows, where an effort was made to remove the large field of Indian (he said “false”) hellebore growing there because it was considered a “toxic and invasive weed” that needed to be removed. Gordon Meadows was used as a cattle pasture for more than 100 years, so it is easy to see how a poisonous plant that causes deformities could be regarded as a weed. Elk can be seen moving through the Gordon Meadows Indian hellebore patch on Table 7, early in the growing season, and several chewed but uneaten Indian hellebore leaves were found in their trail.

This plant is listed in the daily inventories (Part 2; Appendix C) and USDA weed lists as “false hellebore,” but the earlier name for the plant is being used for this report for reasons given by Haskin (1934: 54):

Among the Indians of the North Coast no plant was more highly valued for its magical potency than this [Indian hellebore]. It was truly “skookum medicine,” if we may judge from their myths and legends, which record endless instances of its marvelous use and powers.

Haskin then recounts several stories regarding the types of “supernatural” and “magical” uses of the plant, but no medicinal uses. Haskin was a local historian, amateur botanist, and photographer of some re-known in the early to mid-1900s; he was also an avid collector of oral histories and regional Indian stories and was paid by the WPA during the Depression to conduct such interviews in

the Linn County area, in which this study is located, so he is an acknowledged authority on this topic.

An Internet search of western US Native American uses of Indian hellebore turned up more than 100 separate entries, including:

Used mainly as a poultice of the mashed raw root as a treatment for rheumatism, boils, sores, cuts, swellings, bruises, and burns;

The root is analgesic, disinfectant and febrifuge. A decoction has been used in the treatment of venereal disease;

It also had quite a reputation as a contraceptive. A decoction of the root has been taken orally by both men and women as a contraceptive;

A dose of one teaspoon of this decoction three times a day for three weeks is said to ensure permanent sterility in women;

The roots have been grated then chewed and the juice swallowed as a treatment for colds;

The powdered root has been rubbed on the face to allay the pain of toothache;

Dried powder of Indian hellebore was used to treat fleas and other skin parasites;

The roots were eaten to commit suicide.

[Note: I am not a botanist or an ethnobotanist, and it is entirely possible I have misidentified this plant. However, the plant documented at Gordon Meadows and a few other locations is so similar in appearance and description to Haskin's "Indian hellebore," that even if it is a slightly different species I assume it may have been used for entirely similar purposes as listed above, much as the different varieties of ribes or huckleberries were used in the same manners. BZ]

10) Blue huckleberry is the name given by the field researchers to favored huckleberries at higher elevations, and without consulting one another on this designation or having a plan to do so. For some reason, the name "blueberries" was given to lower elevation huckleberries of the same color (see Appendix C), and they are likely an entirely different variety. An examination of the photographic evidence can help resolve naming differences in these fruits, but there is an obvious wide range of huckleberry varieties at all elevations of the study area, and most appear to be remnants of former fields of much greater extent. The cultural and commercial value of wild berry crops, and particularly

huckleberries, to Oregon Indian families probably cannot be overstated, but is still generally overlooked by federal resource managers (Minore 1972; Richards and Alexander 2006). The Sweet Home Ranger District is an exception to this rule, however, and has worked with western Oregon Tribes to restore huckleberry harvests for at least 15 years (Farquay 2007, personal communication).

Plant Management. Virtually nothing is known of Santiam Molalla plant management methods. An eyewitness observer wrote: “On the west face of the Cascades the Molallas claimed dominion, and fire was their agency for improving the game range and berry crops” (Minto 1908: 153), and that appears to be highly likely (Minore, et al. 1979; Boyd 1999b; Stewart 2002; Zybach 2003). However, other methods of plant management, including pruning, thinning, tillage, peeling, and weeding, also had to have been performed in order to increase plant productivity and product quality. These processes were probably universal throughout the range of these plants (K. Anderson 2005: personal communication, September, 2007), and can reasonably be inferred for the Santiam Molalla. Anderson (1993) also suggests experimental methods by which past practices might be rediscovered, and this process is listed as a recommendation for Gordon Prairie restoration (Part 8).

6. Fish and Game Products

It was not the purpose or intent of this project to monitor or document wildlife populations. However, a decision was made to document incidental encounters with local wildlife as the inventory was taking place (see Table 7), and numerous photographs and daily journal entries document the variety and widespread distribution of favored elk, butterflies, coyote, bear, deer, quail, grouse, frog, salamander, boomer, red ant populations, and other wildlife, that were encountered during this project. Some results were unusual, such as the unexpected documentation of two piles of mutilated salmon on Moose Creek bedrock (Swanson 2007), or the growing collection of GPS-referenced wildlife scat photographs accumulated by N. Lapham (see Table 2). Apparently people and wildlife like to go in the same places, is one thing we learn.

The Molalla had a reputation as skilled hunters, particularly for elk, which naturally form in herds (Frair, et al. 2005; Kie, et al. 2005). Mrs. Howard, a Clackamas Chinook informant to Melville Jacobs, said: "All the Molala people did was hunt!" (Winkler 1984: 5). Molallans were also known for their elkhorn spoons, blackberries, and huckleberries, and it is very likely that men hunted the same trail networks used by women and children to pick berries and dig roots and bulbs -- and just as likely during the same times of the year, depending on the movements and locations of the animals during harvest times. Mollalan men used dogs and snowshoes to hunt (Zenk and Rigsby 1998), and these tools would have greatly aided their success, in addition to allowing them to hunt on a year round basis.

Deer, bear, and birds like ripe berries, too, and beargrass may have got that name from the habit of bears digging and eating the bulbs in the spring, when people did.

Big Game. The evidence of greater human land use levels in the past may have possibly led to larger populations of deer and elk, although this notion is strongly refuted by Kay (2007), Lake (personal communications, 2007), and others. Larger populations of elk (if, indeed, they existed) would have likely been a result of far more browse being available in far more locations -- including protected valleys and widespread prairie grasslands -- throughout the year. Browse is also much poorer in quantity and quality within today's conifer forests (Frair, et al. 2005; Kie, et al. 2005), which have increased greatly in area and density during the past 200+ years, than in the grasslands and shrublands that likely characterized much of the study area during the 1750 to 1850 time period, and earlier.

"Bud" (A. T.) Morris was a life-long resident of the South Santiam Valley, having been born near Foster in the 1860s, and was in regular contact

Table 7. Local South Santiam River and Blue River wildlife species.

	
<p>Elk, Gordon Meadows. B. Zybach</p>	<p>Squirrel in meadow. E. Esselstyn</p>
	
<p>Blue butterfly in beargrass. D. Lewis</p>	<p>Frog, Falls Creek. B. Zybach</p>
	
<p>Headless salmon, Moose Creek. N. Lapham</p>	<p>Grouse on road. E. Esselstyn</p>

with local Indian families during his childhood. He was interviewed by Linn County historian Leslie Haskin in the 1930s:

Morris reported that there had been many deer during the early days because the Indians came through in little bands, setting fire to the open range, keeping the brush burned down. “The open country, free from brush and undergrowth, made hunting and cattle herding a much easier task than it is now,” he said. (Carey and Hainline 1979: 7)

Deer will also herd up if their populations become large enough, and become much easier to kill when they do. In herds, animals can be boxed into dead end canyons, or guided through narrow passes or trails where they can be readily slaughtered. This was also a common practice among pioneer white families along the South Santiam River: “up the Moose Mountain Road was Bloody Point, so named for a box canyon where deer and elk were corralled and slaughtered [in the late 1800s] for their hides” (Carey and Hainline 1979: 114).

Resident and Anadromous Fish. Local fish were not sufficiently abundant in numbers or large enough in size to form a regular staple of Santiam Molalla diets. Anadromous fish ran a gauntlet of highly skilled fishermen without limits or limitations in fishing methods, from Astoria to the Willamette Falls, and from the mouth of the Santiam to the juncture of the Middle Santiam and South Santiam rivers; before entering the study area and immediately encountering impassable waterfalls and long shallows of water. Bears were also good fishermen, and it is likely that only a few, if any, salmon or steelhead ever reached Canyon Creek, Moose Creek, or Falls Creek most years. Regular lamprey eel runs may have been more reliable as a food source, but exactly how much is unknown.

The damming of the junction of Middle Santiam and South Santiam rivers at Foster in the 1960s ended all potential salmonid and eel runs into the study area. From 1934 until 1942, the US Bureau of Fisheries conducted a series of “Stream Habitat Surveys” on all of the fish bearing tributaries of the Columbia River. A portion of the 1938 report on the South Santiam stated:

Rainbow and cutthroat trout are abundant in the upper reaches of the South Santiam above Cascadia where the water is colder, but they seldom exceed 6” in length. In the lower, warmer portion, cyprinids [Oregon chub] are numerous. Dace are abundant everywhere. Fishing intensity is moderate, but the lack of large fish keeps this stream from being very popular with anglers. In 1937, salmon were permitted to ascend the South Santiam unhindered, and a fair run of spring Chinooks for this region occurred. (McIntosh et al 1990: 227)

On September 17, 2007, while stopping on the Moose Creek bridge to document potential creek crossing locations, we (N. Lapham and author) noticed two piles of dead salmon in the water with their noses cut off (see Table 7). At first they appeared to have spawned out, but the partially-severed heads made them look dolphin-like and unnatural. They had apparently been dumped from the bridge and were likely destined to be flushed into South Santiam River or Foster Reservoir with the first heavy fall rains. We guessed a public relations move. On September 19, the full story was on the front page of the local paper -- the fish had not been illegally dumped and were not native spawn: their placement was apparently a public relations effort, as surmised (Swanson 2007).

7. Summary of General Findings

The following list of research findings is based on information acquired through archival and field survey methods used to complete this project (Part 2), and on subsequent analyses of documentation acquired through those means. The findings are expressed in general terms, so as to be representative of the entire study area, and for much or all of the 1750-1850 research time period.

1) The theoretical ridgeline trail network model used to produce the project's predictive map (Part 2; Zybach 2002; 2003) proved vital to the success of this project. Such maps (and their hypothetical basis) can likely be developed and used with confidence for similar purposes in other forested areas of the region with similar topography. The current, digital version of this map is now on file with the Tribe in a GIS format that can continue to be refined, and to be used to inventory cultural resources, as more information becomes available.

2) All contiguous locations in the study area are less than 25 miles distance by trail from one another; meaning that, in the absence of snow, everyplace could be reached by walking in a day's time or less. This is an important feature for a pre-horse society that traveled almost entirely by foot, because the rivers and creeks are too steep and shallow, and the lakes and ponds are too small and isolated for most canoes or other watercraft.

3) Most of the study area is high elevation and inaccessible due to snow for much of the year. Only the South Santiam River corridor of prairies and meadows are below 1500' elevation, and remain snow-free and habitable most of the year. There is extensive archaeological evidence that riparian areas and ridgelines were heavily used for centuries and millennia before white contact, as weather permitted.

4) There are a significant and widespread variety of edible berries that ripen at most aspects and elevations throughout the entire summer. There are also significant fields and meadows of seeds, greens, roots, nuts, and bulbs in the study area that have good food value and were likely harvested in the spring and fall. Most food plants occurred at virtually every elevation, but prized blue huckleberry, beargrass, and Indian hellebore crops were only documented at sites above 3,000 feet elevation.

5) Most areas of human food production have become noticeably smaller in the past 50 years, and appear to have been diminishing in size for several centuries. Huckleberry fields, beargrass meadows, strawberry patches, ridgeline grasslands,



Figure 6. Human presence on the South Santiam River. Evidence of the long-term presence of people, including the entire time period of Santiam Molalla occupation and residency, was predicted, observed, and documented throughout the study area. This was probably the single most important finding. B. Zybach

and brakes all appear to be much smaller today than during the 1750 to 1850 time period, and, in turn, were apparently much smaller during that time, than during the 1500 to 1650 time period. This decline in size is largely marked, and caused, by the encroachment of conifer trees into perimeter areas previously kept free of trees via regular burning and tillage.

6) The evidence of greater intensive and extensive human land use levels in the past may have led to larger populations of deer and elk. This would have been as a result of far more forage being available in far more locations -- including protected valleys and widespread prairie grasslands -- throughout the year. Browse and grazing forage is also much poorer in quantity and quality within conifer forests, which have increased greatly in area and density during the past 200+ years, than in grasslands and shrublands, which have correspondingly decreased in size.

7) Local fish were not sufficiently abundant in numbers or large enough in size to form a regular staple of Santiam Molalla diets. Anadromous fish ran a gauntlet of highly skilled fishermen without limits or limitations in fishing

methods, from Astoria to the Willamette Falls, and from the mouth of the Santiam to the juncture of the Middle Santiam and South Santiam rivers; before entering the study area and immediately encountering impassable waterfalls and long shallows of water. Bears were also good fishermen, and it is likely that only a few, if any, salmon or steelhead ever reached Canyon Creek, Moose Creek, or Falls Creek most years. Regular lamprey eel runs may have been more reliable as a food source, but probably not much, if any. Local trout rarely exceeded 6" in size, and could only be harvested seasonally in most places. The actual extent of anadromous (including eels) and resident fish use is unknown.

8) Large amounts of commercial-grade weaving materials could be found at all elevations, but beargrass could only be obtained above the 4,000 foot level. Other local plants likely used and traded by Santiam Molalla for weaving purposes include willow, redcedar, bigleaf maple, hazel, flags (wild iris), carex, and bunchgrass. Beargrass was particularly prized as a trade item, but willow baskets or other manufactured goods may have been of greater or equal importance.

9) Woody fuels can be readily found within several minutes walk in almost every part of the study area, and the Santiam Molalla had no trouble finding or stockpiling fuel near residences and camping areas.

10) Freshwater can be found easily in almost all parts of the study area, during all seasons, at most elevations.

11) The mainstem South Santiam River and McKenzie River corridors leading from the Willamette Valley to the Santiam Pass were extremely strategic holdings for the Molalla. The Klamath traded slaves, woks, and other goods in heavily-used north-south trails through these lands, and much trade and travel from western Oregon to Obsidian Cliffs, Fish Lake and eastern Oregon had to pass through long stretches of narrow, highly visible trails and steep, easily monitored and protected canyons of the Santiam Molalla to reach their destinations.

8. Discussion, Hypotheses & Recommendations

Part 7 of this report summarized the basic findings of research conducted for this project. This concluding portion looks at these data in three ways: 1) how this information can be synthesized to produce a more detailed idea of the life-ways of Santiam Molalla families and communities who lived in the study area from 1750 to 1850; 2) reasonable research questions that can be asked to further refine these findings; and 3) my personal recommendations regarding possible uses of these methods and materials.

Discussion: Owl Ridge Trails Project

Owl Ridge is a key landscape feature of an ancient 250,000-acre or larger camas prairie, berry patch, beargrass meadow, old-growth conifer, summer home, hunting grounds, campground, fishing hole, wetland, beaver marsh, and ridgeline trail complex that dates back millennia before white discovery and occupation. The well-defined patterns of land use, management, and occupation were likely maintained by Santiam Molalla, Blue River Molalla, Santiam Kalapuya, Calapooia Kalapuya, Klamath, Wasco, Paiute, and Cayuse families and communities and their predecessors, ancestors, friends and neighbors for perhaps 2,000 to 3,500 years, or even longer. Today the land is mostly managed by the USDA Forest Service, from the Sweet Home, Sisters, and Blue River Ranger Districts of the Willamette and Deschutes National Forests.

These attractive and highly productive lands drew travelers, hunters, traders, basketweavers, cooks and food gatherers since time immemorial, for extended periods of time in the same places, often with the same families, year after year. Today the land is mostly managed by the USDA Forest Service, from the Sweet Home, Sisters, and Blue River Ranger Districts of the Willamette and Deschutes National Forests.

Camas, willow, and beargrass were harvested daily for weeks on end, in well-known and maintained locations, from May or June through September or October. Firewood was gathered and the camas baked and processed during these months, and in July and August, when the lower elevation berries began to ripen. During this time huckleberries, blackberries, strawberries, thimbleberries, wild cherries, raspberries, blue elderberries, chinquapin nuts, manzanita fruits, salal, Oregon grape, filberts, rose hips, pine nuts, and other fruit, nut, and root crops ripened, and were gathered, eaten, and processed for trade or winter use.

During all of these summer months, elk and deer were routinely hunted, killed, skinned, butchered and prepared into an endless supply of cured hides, jerked meat, and elk-horn and bone utensils. Fish were caught and eaten when available, as were birds, eggs, rabbits, bear, crawdads, boomer, squirrels, and other game. The Molalla had dogs for hunting, companionship, and protection

purposes and used snowshoes during late fall, winter, and spring months to extend their hunting and firewood gathering activities.

In October and November, the fall rains began, salmon entered the rivers and the Molalla could fish or trade for fish from adjacent tribes; in November and December the snows began to push the elk and deer into lower elevations, the males went into rut, the yearlings had become big enough to eat, and whole herds became vulnerable to systematic hunts.

From October to April, the weather is often inclement, and the ground is covered with snow for extended periods. Brakes were burned and harvested for roots and sprouts during these periods, hunting was conducted systematically, cambium bark peeled, and new shoots gathered in the spring. Firewood was gathered when stockpiles ran low, or as opportunity allowed. People mostly stayed near their winter homes or towns, at lower elevations, during these months. Sometime in May, after the snows and bad weather were gone, people began to move back to their summer homes and temporary campgrounds along the river, and at the mouth of Owl Creek, to visit with old friends and acquaintances, hunt, fish, trade, party, and begin digging camas, picking berries, and gathering beargrass on family plots and fields, just as their parents and grandparents had taught.

Questions

This data is intended to be used for educational and resource management purposes. The following questions are examples of the types of uses of this material that can be developed as hypotheses in academic settings for educational or research purposes. Answers to these types of questions can also provide good information for better managing these resources in the future.

1. Some people contend that the Santiam Molalla lived in the western Cascades for thousands of years; others maintain that they were immigrants to the area, and may have arrived as recently as 1820, or somewhat earlier, perhaps 1750 or 1780.

a) If the Molalla only arrived in the western Cascades sometime after 1750, who were the previous occupants? What became of those people, and when did it happen, to allow such free access to the Molallans?

b) If the Molallans have actually lived in the western Cascades for hundreds or thousands of years, what caused them to mostly abandon the once-largely agrarian huckleberry, beargrass, and camas fields throughout the study area? Were their numbers reduced by disease, famine, or warfare? Did they simply develop more efficient methods of survival?

c) How many people, approximately, lived in the study area most of the year in 1750? 1650? 1500? 1200?

2. Conifer tree populations have apparently expanded their range and population densities over the course of the past 300 to 500 years within the study area, a pattern that seems common throughout much of the Douglas-fir Region.

a) If so, is this a function of climate change or some other natural, nonhuman, phenomenon?

b) If so, is this a reflection of changing human populations, market values, resource management methods, politics, or other human-related cause? Are conifer expansions related to human population declines in some way?

3. Huckleberry fields, old-growth trees, ridgeline prairies, brakes and wildflower meadows have all been seemingly reduced in size and numbers during the past 50-250 years.

a) If so, should efforts be made to restore these trees and lands to past conditions? How and why?


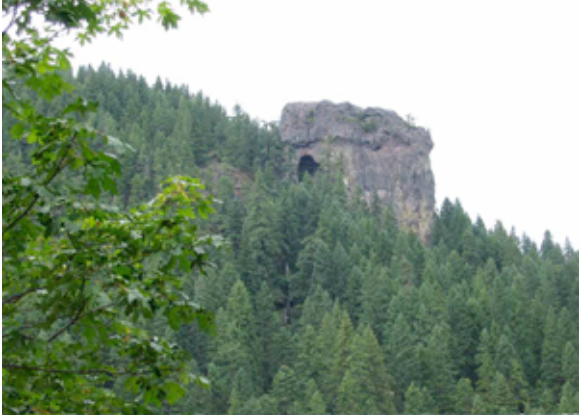




b) Should this be a concern of government, Tribes, or private citizens?

Recommendations

The value of these findings and questions is directly related to the uses to which they are put. The primary purposes for gathering this information was to provide information of cultural, educational, and resource management value to the members of the Confederated Tribes of Grand Ronde. The following recommendations are made with that idea in mind. They are intended for discussion, revision, and/or replacement with better ideas, and are not intended to be comprehensive or exclusionary.

1) Trails Research. Continue and expand this type of ancestral land use research and documentation on the public lands of western Oregon, by partnering with BLM, the US Forest Service, US Fish & Wildlife Service, and/or USDI National Park Service for purposes of funding, information sharing, and collaborative resource management opportunities. Many of the landmarks documented in this work have lost their names, and federal agencies would be the best place to begin assigning traditional Indian names to these features. The same idea holds true for hunting, gathering, and fishing rights and options.

Table 8. Recommendations.

	
<p>Ancient vistas. N. Lapham</p>	<p>Unnamed rocks. N. Lapham</p>
	
<p>Prairie forestation. N. Lapham</p>	<p>Wildfire hazards. N. Lapham</p>
	
<p>Cultural landmarks. D. Lewis</p>	<p>Future generations. B. Zybach</p>

2) GIS Mapping. Field data from this project has already been gathered and transformed into discrete GIS layers by the Grand Ronde mapping department. This data has already been used for a number of useful GIS mapping products, including those used in this report, and maps used for presentation of this material to the Tribal Council. Other possible uses include: a) computerized road maps of the area can be made in which all photographs of intersections, signs, blocked roads, slides, etc., can be displayed, making road navigation much safer and easier than with conventional maps, and making getting lost almost impossible; b) a road and trail map can be made in which all the photographs of fruits, flowers, berries, bulbs, and weaving materials can be shown, and on what dates and in what locations the pictures were taken, for gathering purposes; c) a recreational trail map can be made for hiking, hunting, or spiritual uses, for following the old trails, and visiting the landmarks, and that shows the pictures of these places; d) an educational “virtual tour” of the area in Santiam Molalla time can be made by draping the historical photos and modern trails research over a 3-D “D.E.M.” layer and modifying surface patterns and QTVR panoramas to approximate past times and conditions; and e) an increasingly detailed and accurate archaeological predictive map and cultural resource inventory can be further developed and refined from the base model created for this project.

3) Gordon Meadows Restoration. Gordon Meadows is a secluded camas prairie surrounded by huge 350-year old conifer trees and fields of blue mountain huckleberries and wild strawberries. It is contained in a subbasin of about 2,000-acres that can serve for demonstration and experimental purposes (Anderson 1993; Minore et al. 1979; Carloni 2005). The Santiam headwaters and adjacent subbasins appear to have a remarkable amount of relict cultural landscape patterns remaining from the time of Santiam Molalla ownership and occupation, and from earlier times as well. Most of this area is currently under federal management, with whom formal resource management rights exist with the Confederate Tribes of Grand Ronde. Information resulting from experimental findings and demonstration projects such as this proposal would seemingly be very helpful for future cultural and natural resource management, restoration, interpretation and protection purposes [*NOTE: see Zybach 2008 for additional information on this recommendation.*]

4) Public Education. Information discovered and documented during the course of this research can be put to excellent use for purposes of public education regarding Oregon history, Santiam Molalla life-ways, cultural resources protection, meadow restoration, and a wide range of related topics. Oregon Websites and Watersheds Project, Inc. exists specifically for the purpose of using information of this type for better understanding Oregon’s history, culture, and resource management options and opportunities. Video programs, commercial maps, learning games, and formal curricula would be other types of products that can readily be developed with this data for educational uses.

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Appendix A. Names on the Land and Water

This appendix is primarily comprised of a map and two tables: a) a table of named sources, courses, and bodies of water; and b) a table of named landmarks and locations. These are names given to features within the study area that, for the most part, are officially recognized by the USGS and routinely appear on local maps and guides. Most of these names seem to have been assigned between the time of initial federal USDI and USFS ownership and management, in the late 1890s and early 1900s, and World War II. Few names survive from a time earlier than this 1893-1941 period, and none date to the 1750-1850 time of Santiam Molalla ownership, or to any time earlier than that.

The names people give the features on the landscape are important to a better understanding of both the land and the people who live there. No Santiam Molalla names have been recorded in the study area. The Molalla name for People (“Latiwi”) has recently been substituted for the offensive name of “Squaw” for a significant mountain and a primary South Santiam headwater tributary in the study area, but “Indian Prairie” has now been called “Tombstone Prairie” for more than 100 years, and no other references to Indian or Molallan culture -- with the exception of some recently renamed USFS commercial campgrounds along the South Santiam River -- appear on the landscape today.

Table A1 (pg. 62). Each of these names is referenced geographically by the drainage or subbasin in which it is tributary or located, by legal description (Metsker 1938), and by historical written or mapped sources. Most of these names are shown on the index map, which is currently in the process of being updated.

Table A2 (pg. 65). Each of these names is referenced by the subbasin in which it is located, by legal description (Metsker 1938), and by historical written or mapped sources. Some names, such as “Elephant Mountain,” have apparently been forgotten and are no longer used; other names, appearing with an asterisk (*), were informally assigned for purposes of convenience during the course of this project and are included for general reference purposes. Most of these names are also shown on the index map, which is currently in the process of being updated.

Map 6. Index of Landmark Names in Owl Ridge Trails Project area.

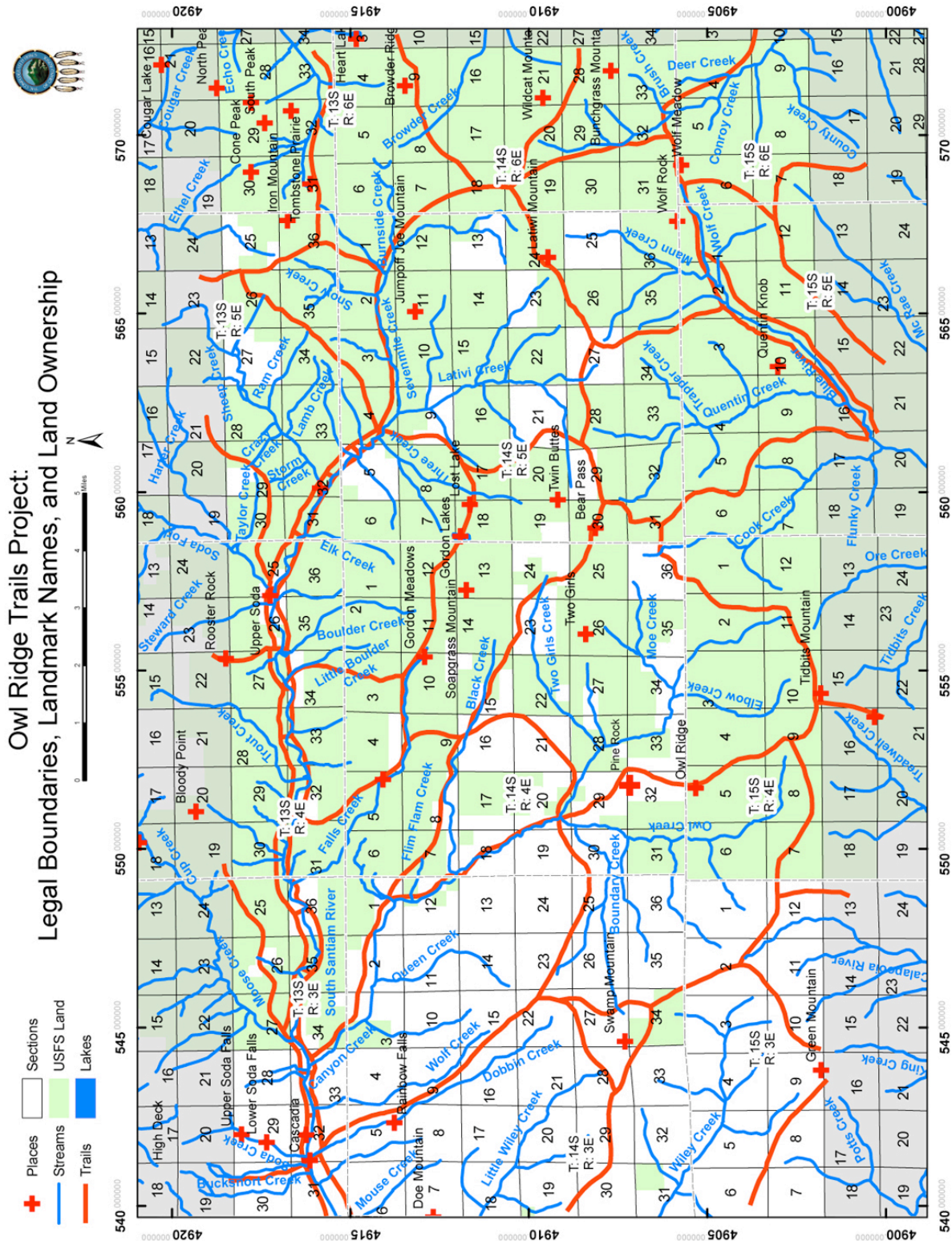


Table A1. Named sources, courses, and bodies of water.

Current Name	Tributary To	Tsp.	Rng.	Sec.	References
Beaver Lakes	Middle Santiam River	13 S.	5 E.	1	USGS 1946
Black Creek	Canyon Creek	14 S.	3 E.	12	Metsker 1938
Blue River	McKenzie River	15 S.	5 E.	10	GLO 1896
Boulder Creek	South Santiam River	13 S.	4 E.	27	GLO 1883
Boundary Creek	Owl Creek	14 S.	4 E.	29	Metsker 1938
Browder Creek	Smith River	14 S.	6 E.	16	Metsker 1938
Brush Creek	Deer Creek	14 S.	6 E.	32	Metsker 1938
Bucksnot Creek	South Santiam River	13 S.	3 E.	31	Metsker 1938
Burnside Creek	Sevenmile Creek	14 S.	5 E.	1	USDA 1997
Cabin Creek	South Santiam River	13 S.	3 E.	31	Metsker 1938
Cadenza Creek	Deer Creek	14 S.	6 E.	29	Metsker 1938
Canyon Creek	South Santiam River	13 S.	3 E.	33	GLO 1879
Carpenter Creek	Deer Creek	15 S.	6 E.	9	Metsker 1938
Coley Creek	Owl Creek	14 S.	4 E.	31	Metsker 1938
Conroy Creek	Deer Creek	15 S.	6 E.	4	Metsker 1938
Cook Creek	Blue River	15 S.	5 E.	8	Metsker 1938
Cougar Creek	Middle Santiam River	13 S.	6 E.	29	Metsker 1938
County Creek	Deer Creek	15 S.	6 E.	9	Metsker 1938
Crazy Creek	Sheep Creek	13 S.	5 E.	33	Metsker 1938
Cul de Sac Creek	Owl Creek	15 S.	4 E.	6	Metsker 1938
Deer Creek	Smith River	15 S.	6 E.	9	Metsker 1938
Dobbin Creek	South Santiam River	13 S.	3 E.	32	GLO 1879
Echo Creek	Hackleman Creek	13 S.	6 E.	28	Metsker 1938
Elbow Creek	Canyon Creek	14 S.	4 E.	34	Metsker 1938
Elk Creek	South Santiam River	13 S.	5 E.	31	GLO 1896
Ethel Creek	Middle Santiam River	13 S.	6 E.	30	Metsker 1938
Falls Creek	South Santiam River	13 S.	3 E.	26	GLO 1896
Flimflam Creek	Canyon Creek	14 S.	3 E.	12	Metsker 1938

Gordon Lakes	Three Creek	14 S.	5 E.	18	Metsker 1938
Hackleman Creek	Clear Lake	13 S.	6 E.	33	Metsker 1938
Harter Creek	Soda Fork	13 S.	4 E.	24	Metsker 1938
Heart Lake	Hackleman Creek	14 S.	6 E.	3	Metsker 1938
Indian Creek	Hackleman Creek	13 S.	6 E.	33	Metsker 1938
Keith Creek	South Santiam River	13 S.	4 E.	26	Metsker 1938
Lamb Creek	Sheep Creek	13 S.	5 E.	28	Metsker 1938
Latiwi Creek	South Santiam River	14 S.	5 E.	9	USDA 2002
Little Boulder Creek	South Santiam River	13 S.	4 E.	27	Metsker 1938
Little Wiley Creek	Wiley Creek	14 S.	3 E.	18	Metsker 1938
Loon Creek	Owl Creek	14 S.	4 E.	31	Metsker 1938
Lost Lake	Three Creek	14 S.	5 E.	18	Metsker 1938
Lower Soda Falls	Soda Creek	13 S.	3 E.	29	
Mann Creek	Blue River	15 S.	5 E.	2	Metsker 1938
McRae Creek	Lookout Creek	15 S.	5 E.	12	Metsker 1938
Middle Santiam River	Santiam River	13 S.	5 E.	25	
Moe Creek	Canyon Creek	14 S.	4 E.	34	Metsker 1938
Moose Creek	South Santiam River	13 S.	3 E.	34	GLO 1879
Moose Creek Falls	Moose Creek	13 S.	3 E.	27	USGS 2007
Moose Lake	Moose Creek	13 S.	4 E.	18	Metsker 1938
Mouse Creek	South Santiam River	14 S.	3 E.	6	Metsker 1938
North Fork Calapooia River	Calapooia River	15 S.	3 E.	12	GLO 1901
Ore Creek	Blue River	15 S.	4 E.	11	Metsker 1938
Owl Creek	Canyon Creek	14 S.	4 E.	20	Metsker 1938
Potts Creek	Calapooia River	15 S.	3 E.	7	Metsker 1938
Queen Creek	Canyon Creek	14 S.	3 E.	2	Metsker 1938
Quentin Creek	Blue River	15 S.	5 E.	9	Metsker 1938
Rainbow Falls	Dobbin Creek	14 S.	3 E.	5	USGS 1946
Ram Creek	Sheep Creek	13 S.	5 E.	28	USDA 1997
Sevenmile Creek	South Santiam River	14 S.	5 E.	9	Metsker 1938
Sheep Creek	South Santiam River	13 S.	5 E.	32	Metsker 1938

Slide Creek	South Santiam River	13 S.	6 E.	33	Metsker 1938
Slipout Creek	Blue River	15 S.	5 E.	4	Metsker 1938
Smith River	McKenzie River				Metsker 1938
Snow Creek	Sevenmile Creek	14 S.	5 E.	2	GLO 1896
Soda Creek	South Santiam River	13 S.	3 E.	32	Metsker 1938
Soda Fork	South Santiam River	13 S.	4 E.	25	GLO 1883
Soda Spring	Soda Creek	13 S.	3 E.	31	Metsker 1938
South Santiam River	Santiam River	13 S.	3 E.	31	Gibbs-Starling 1851
Stewart Creek	South Santiam River	13 S.	4 E.	26	Metsker 1938
Storm Creek	Sheep Creek	13 S.	5 E.	32	Metsker 1938
Taylor Creek	Soda Fork	13 S.	4 E.	25	Metsker 1938
Three Creek	South Santiam River	14 S.	5 E.	4	GLO 1896
Tidbits Creek	Ore Creek	15 S.	4 E.	10	Metsker 1938
Toll Creek	South Santiam River	14 S.	5 E.	5	Metsker 1938
Trapper Creek	Blue River	15 S.	5 E.	4	Metsker 1938
Trout Creek	South Santiam River	13 S.	4 E.	32	GLO 1883
Two Girls Creek	Canyon Creek	14 S.	4 E.	28	Metsker 1938
Upper Soda Falls	Soda Creek	13 S.	3 E.	29	Metsker 1938
Whiterock Creek	Moose Creek	13 S.	3 E.	27	Metsker 1938
Wiley Creek	South Santiam River	14 S.	3 E.	31	Metsker 1938
Wolf Creek (1)	South Santiam River	13 S.	3 E.	32	Metsker 1938
Wolf Creek (2)	Blue River	15 S.	5 E.	2	Metsker 1938

Table 2A. Named landmarks and locations.

Current Name	Subbasin	Tsp.	Rng.	Sec.	References
Bear Pass	Quentin Creek	14 S.	5 E.	30	Metsker 1938
Beargrass Meadow*	Black Creek	14 S.	4 E.	15	*ORWW 2007
Bloody Point	Trout Creek	13 S.	4 E.	20	Metsker 1938
Browder Ridge	Browder Creek	14 S.	6 E.	9	Metsker 1938
Bunchgrass Mountain	Deer Creek	14 S.	6 E.	28	Metsker 1938
Carpenter Mountain	Wolf Creek	15 S.	6 E.	7	Osborne 1933
Cascadia	Bucksnot Creek	13 S.	3 E.	31	Metsker 1938
Cascadia Caves	Soda Creek	13 S.	3 E.	32	USGS 1946
Cone Peak	Hackleman Creek	13 S.	6 E.	29	Plummer 1901
Crossroads Camp*	North Fork Calapooia River	15 S.	3 E.	2	*ORWW 2007
Doe Mountain	Mouse Creek	14 S.	3 E.	7	Metsker 1938
Echo Mountain	Hackleman Creek	13 S.	6 E.	28	Metsker 1938
Elephant Mountain	Canyon Creek	14 S.	3 E.	1	GLO 1879
Fernview	Boulder Creek	13 S.	4 E.	27	USGS 1986
Fishing Rock*	Falls Creek	13 S.	3 E.	32	*ORWW 2007
Gordon Meadows	Falls Creek	14 S.	4 E.	11	Metsker 1938
Green Mountain	Wiley Creek	15 S.	3 E.	9	Metsker 1938
Green Mountain Ridge	Wiley Creek	15 S.	3 E.	6	Metsker 1938
Happy Camp	Wiley Creek	15 S.	3 E.	6	Metsker 1938
Harter Mountain	Harter Creek	13 S.	5 E.	10	Metsker 1938
High Deck	Whiterock Creek	13 S.	3 E.	16	Metsker 1938
House Rock	Sheep Creek	13 S.	5 E.	32	USGS 1946
Iron Mountain	Sevenmile Creek	13 S.	5 E.	36	GLO 1896; Osborne 1933
Jumpoff Joe Mountain	Sevenmile Creek	14 S.	5 E.	11	Osborne 1937
Latiwi Mountain	Latiwi Creek	14 S.	5 E.	24	USDA 2002
Long Ranch	Trout Creek	13 S.	4 E.	32	Metsker 1938
Longbow Camp	Falls Creek	13 S.	4 E.	31	Metsker 1938
Lost Prairie	Hackleman Creek	13 S.	6 E.	27	GLO 1896
Moose Mountain	Moose Creek	13 S.	4 E.	11	Metsker 1938

North Peak	Echo Creek	13 S.	6 E.	28	Metsker 1938
Owl Ridge	Owl Creek	14 S.	4 E.	32	Metsker 1938
Pine Rock	Owl Creek	14 S.	4 E.	29	Metsker 1938
Quentin Knob	Quentin Creek	15 S.	5 E.	10	Metsker 1938
Rooster Rock	Keith Creek	13 S.	4 E.	22	Osborne 1937
Soapgrass Mountain	Black Creek	14 S.	4 E.	13	Metsker 1938
South Peak	Hackleman Creek	13 S.	6 E.	29	Metsker 1938
Swamp Mountain	Dobbin Creek	14 S.	3 E.	34	Metsker 1938
Tidbits Mountain	Elbow Creek	15 S.	4 E.	10	Osborne 1934
Tombstone Pass	Hackleman Creek	13 S.	6 E.	31	Metsker 1938
Tombstone Prairie	Hackleman Creek	13 S.	6 E.	31	Plummer 1901
Twin Buttes	Two Girls Creek	14 S.	5 E.	19	Osborne 1933
Two Girls	Two Girls Creek	14 S.	4 E.	26	Metsker 1938
Upper Soda	Soda Fork				Metsker 1938
Wildcat Mountain	Browder Creek	14 S.	6 E.	21	Osborne 1934
Wolf Meadow	Wolf Creek	15 S.	6 E.	6	Metsker 1938
Wolf Rock	Mann Creek	14 S.	5 E.	36	Metsker 1938

Appendix B. Santiam Molalla Destinations and Foot-Trail Routes

This appendix lists the 32 individual Santiam Molalla foot-trail segments described in Part 4 of this report, and assigns a discrete inventory name and number for each segment.

Map 5 shows the final GIS draft location for each trail segment, and labels each according to the following table. Beginning points and destinations are generally assigned according to access limitations imposed by snow (Part 4), or by where seasonal population centers are assumed to be located (Part 3).

The “Types” of foot-trails listed are divided into four categories:

- 1) **Cross Country** trails follow more than one type of terrain to reach their destination. For example, a trail might leave a location along a river, follow a series of benches along a hillside, and turn uphill along a creek to a saddle, before connecting to a ridgeline campground. Another example might be a straight-line shortcut between two locations; but that would not typically be considered a “primary” trail so much as a “secondary” or “situational” route.
- 2) **Ridgeline** trails follow major ridgelines wherever possible. They are the highest elevation trails and have the shortest, and perhaps busiest, seasonal use periods as a result. They also seem to be the most stable of the trail types, and likely the most ancient and clearly-defined trails.
- 3) **Riparian** trails closely follow waterways and shores, such as along creeks or the shores of lakes and ponds. They are dynamic in that they usually vary from time to time due to seasonal and sometimes permanent changes in shoreline and streambank locations.
- 4) **Riverine** trails are the most dynamic and usually the most heavily used trails, because people tend to reside most heavily along riverbanks and near the mouths of streams. These trails usually follow both sides of a river, at least during seasonal flooding periods, and directly connect population centers and key fishing and trading locations. These trails are subject to floods, landslides, and major creek crossings, among other things, and may vary significantly in location between late summer and mid-winter.

Table B1. Santiam Molalla Trails Network: Primary travel, trade, and resource use foot-trail segments, 1750-1850.

Trail Name	No.	From	To	Type
Bear Pass	01	Quentin Creek Mouth	Bear Pass	Ridgeline
Black Creek	02	Black Creek Mouth	Bear Pass	Cross Country
Blue River	03	Blue River Mouth	Wolf Rock	Riverine
Boundary Creek	04	Owl Creek Mouth	Swamp Mountain	Riparian
Browder Ridge	05	Latiwi Mountain Divide	Browder Ridge	Ridgeline
Bunchgrass Mountain	06	Latiwi Mountain Divide	Bunchgrass Mountain	Ridgeline
Canyon Creek	07	Canyon Creek Mouth	Owl Creek Mouth	Riparian
Carpenter Mountain	08	Blue River Mouth	Carpenter Mountain	Ridgeline
Cascadia North	09	Soda Spring	Moose Ridge	Ridgeline
Deer Creek	10	Deer Creek Mouth	Latiwi Mountain Divide	Riparian
Falls Creek	11	Long Ranch	Gordon Meadows	Cross Country
Gordon Lakes	12	Little Boulder Creek Mouth	Twin Buttes Trail	Ridgeline
Green Mountain	13	Happy Camp	“Crossroads Camp”	Ridgeline
Harter Mountain East	14	Burnside Creek Mouth	Harter Mountain	Ridgeline
Harter Mountain West	15	Latiwi Creek Mouth	Harter Mountain	Ridgeline

Indian Prairie	16	Tombstone Pass	Fish Lake	Cross Country
Latiwi Mountain	17	Bear Pass	Latiwi Mountain Divide	Ridgeline
Mann Creek	18	Mann Creek Mouth	Latiwi Mountain Trail	Ridgeline
Moose Mountain	19	Moose Creek Mouth	Moose Mountain	Ridgeline
North Fork Calapooia	20	North Fork Calapooia River Mouth	Tidbits Mountain	Riverine
Owl Ridge	21	Owl Creek Mouth	Tidbits Mountain	Ridgeline
Rooster Rock	22	Boulder Creek Mouth	Moose Mountain	Ridgeline
Sevenmile Creek	23	Latiwi Creek Mouth	Latiwi Mountain Divide	Riparian
Soda Fork	24	Soda Fork Mouth	Harter Mountain	Cross Country
South Santiam North	25	Cascadia	Latiwi Creek Mouth	Riverine
South Santiam South	26	Cascadia	Latiwi Creek Mouth	Riverine
Swamp Mountain	27	Dobbins Creek Mouth	“Crossroads Camp”	Ridgeline
Tidbits Mountain	28	Bear Pass	Tidbits Mountain	Ridgeline
Twin Buttes	29	Latiwi Creek Mouth	Bear Pass	Ridgeline
Two Girls Creek	30	Owl Creek Mouth	Black Creek Trail	Cross Country
Wiley Creek	31	Wiley Creek Mouth	Swamp Mountain	Ridgeline
Wolf Rock	32	Obsidian Cliffs	Wolf Rock	Cross Country

Appendix C. Local Names of Plants Used by Santiam Molalla

This appendix lists the majority of cultural plants documented by researchers for this study (see Table 2 and Part 5). Academic levels, experience, and interests of the eight surveyors varied considerably, but most had good to excellent basic botanical skills. This list depended on local knowledge of native plants and their names to complete. The final number of named and documented plants is somewhat longer than the list of most common references given in Table C1, and additional plants are listed in the GPS Excel file (see Appendix D).

Plant Names are those given by the field survey crews, often following discussion and consultation with one another. These names (along with a few minor notations of other plants in the daily forms or informal notes) are almost precisely the same as those found by Winkler (1984) in her study of the Molalla in the Middle Fork Willamette and McKenzie river basins (see Part 5). Latin names for these plants are given in Table C2, and can also be found in Winkler, who used Hitchcock as a principal reference.

Lowest and Highest Elevations for each species represents the documented observations of the field researchers, and can be verified and/or refined via their photographic record. These considerations were very important to the Santiam Molalla because many of their most valuable crops were found at the highest elevations of their lands at the very times of the year they likely had the most traffic from neighboring Tribes and other visitors.

Products represents a short list of key products obtained from each species. This listing can be expanded greatly with Haskin (1934) and Anderson (2005).

Table C1. Local names and elevations of plants used by Santiam Molalla.

Plant Name	Type	Lowest	Highest	Product
Alder, Red	Tree	4000'	4200	Fuel, dye
Arrowwood	Shrub	3900'	4100	Tools, fuel
Beargrass	Bulb	3100'	4700	Food, weaving
Blackberry	Vine	0800'	4500	Food, dye
Blackcap	Shrub	3200'	3600	Food
Bracken	Fern	0800'	4500	Food, weaving
Bunchgrass	Grass	4000	4300	Fuel, weaving
Camas	Bulb	0800	4000	Food
Carex	Sedge	1000	1200	Weaving
Cattail	Root	1800	2900	Fuel, food
Cherry	Tree	2300	4200	Food, fuel
Chinquapin	Tree	3900	4100	Food
Chittum	Tree	1700	3600	Medicine, dye
Devil's Club	Shrub	3200	3400	Food, medicine
Gooseberry	Shrub	3900	4100	Food
Hazel	Shrub	1000	2900	Fiber, food
Huckleberry, "Blueberry"	Shrub	0800	2400	Food
Huckleberry, Blue	Shrub	4200	4700	Food
Huckleberry, Red	Shrub	1600	4600	Food
Indian hellebore	Bulb	4100	4800	Medicine, poison
Juncus	Rush	4200	4400	Weaving
Madrone	Tree	2200	2400	Fuel
Manzanita	Shrub	0900	4200	Fuel, food
Maple, Bigleaf	Tree	0900	1700	Weaving, fuel
Mushrooms	Fungi	2000	3600	Food, poison
Nettles	Herb	3500	3700	Fiber, food
Oak, White	Tree	0800	1600 (?)	Food, fuel
Oregon grape	Shrub	1200	2000	Dye, medicine
Pine, Ponderosa	Tree	800	4700	Nuts, pitch, fuel
Salal	Shrub	2400	3200	Food, fiber
Salmonberry	Shrub	1400	4500	Food
Skunk Cabbage	Widflower	0900	3900	Food
Strawberry	Vine	3400	4100	Food, dye
Thimbleberry	Shrub	0800	4500	Food, fiber
Willow	Shrub	0800	4200	Fiber, medicine
Wokas	Bulb	3300	4100	Food

Table C2. Latin names of plants used by Santiam Molalla.

Plant Name	Type	Latin Name
Alder, Red	Tree	<i>Alnus rubra</i>
Arrowwood	Shrub	<i>Holodiscus discolor</i>
Beargrass	Bulb	<i>Xerophyllum tenax</i>
Blackberry	Vine	<i>Rubus ursinus</i>
Blackcap	Shrub	<i>Rubus leucodermis</i>
Bracken	Fern	<i>Pteridium aquillinum</i>
Bunchgrass	Grass	<i>Festuca, spp.</i>
Camas	Bulb	<i>Camassia, spp.</i>
Carex	Sedge	<i>Carex, spp.</i>
Cattail	Root	<i>Typha latifolia</i>
Cherry	Tree	<i>Prunus emarginata</i>
Chinquapin	Tree	<i>Castanopsis chrysophylla</i>
Chittum	Tree	<i>Rhamnus purshiana</i>
Devil's Club	Shrub	<i>Oplopanax horridus</i>
Gooseberry	Shrub	<i>Ribes montigenum</i>
Hazel	Shrub	<i>Corylus cornuta</i>
Huckleberry, "Blueberry"	Shrub	<i>Vaccinium, spp.</i>
Huckleberry, Blue	Shrub	<i>Vaccinium, spp.</i>
Huckleberry, Red	Shrub	<i>Vaccinium parvifolium</i>
Indian hellebore	Bulb	<i>Veratrum viride</i>
Juncus	Rush	<i>Juncus, spp.</i>
Madrone	Tree	<i>Arbutus menziesii</i>
Manzanita	Shrub	Archostaphylos, spp.
Maple, Bigleaf	Tree	<i>Acer macrophyllum</i>
Mushrooms	Fungi	Spp.
Nettles	Herb	<i>Urtica dioica</i>
Oak, White	Tree	<i>Quercus garryanna</i>
Oregon grape	Shrub	<i>Mahonia aquifolium</i>
Pine, Ponderosa	Tree	<i>Pinus ponderosa</i>
Salal	Shrub	<i>Galtheria shallon</i>
Salmonberry	Shrub	<i>Rubus spectabilis</i>
Skunk Cabbage	Wildflower	<i>Lysichiton americanus</i>
Strawberry	Vine	<i>Fragaria, spp.</i>
Thimbleberry	Shrub	<i>Rubus parviflorus</i>
Willow	Shrub	<i>Salix, spp.</i>
Wokas	Bulb	<i>Nuphar polysepala</i>

Appendix D. GPS Photo Points and Human Use Rankings

This appendix lists the 495 GPS readings taken during the course of this research and displays them on an index map of the study area (Map 7). Of this number, about 60 GPS points were recorded for which no photograph was taken; typically to map prairie perimeters or trail locations. Conversely, more than 70 of the points had series of panoramic photographs taken, in over-lapping sequences of three to 12 photos each. Many of these latter sequences were specifically taken to record ancient prairies or meadows, or to capture cultural landscape patterns of vegetation and major landmarks. Most of these sequences, particularly those by N. Lapham, were taken in such a manner as to be capable of being converted to QTVR files: www.ORWW.org/Protocol/#QTVR

Title column uses a combination of photograph number with visual description to formally name each GPS point and a corresponding photograph, and in such a way as to sort chronologically.

Easting and Northing are the GPS coordinates for each photo point that can be located on USGS Quadrangle maps.

Elevation provides data on whether trails are open or not, where desirable plants are located, and about when they'll ripen, or otherwise be available for harvest.

CULTURAL PLANTS RANKING were designated by survey teams, based on the following criteria. Color coding was added to each ranking for purposes of GIS predictive map construction.

"P" column ranks the surveyors' assessment on "Cultural Plants"

1. **Likely (Red).** Large numbers of cultural plants in solid patterns in accessible and regularly used locations that appear to have persisted since 1850, or longer.
2. **Possible (Yellow).** Numbers and location of cultural plants appear to be consistent with known uses, and it appears plants may have been used in this location since 1850, or earlier.
3. **Unknown (Green).** Isolated cultural plants or possible migration patterns make local uses uncertain or even unlikely.
4. **Impossible (Black).** Solid rock or other barrier to cultural plant growth.

PREDICTIVE TRAIL RANKING were designated by survey teams, based on the following criteria. Color coding was added to each ranking for purposes of GIS predictive map construction.

“X” stands for “Trail Crossing,” but is interpreted in the broader sense of apparent human use, including campgrounds, fishing holes, and ridgeline lookouts.

1. **Likely (Red).** Site appears to have strong likelihood of having been regularly used prior to 1850.
2. **Possible (Yellow).** Site could have reasonably been regularly used prior to 1850.
3. **Unlikely (Green).** There is no evidence or other indication the site was regularly used prior to 1850.
4. **Impossible (Black).** Site was likely infrequently used, if at all, before 1850.

Map 7 displays each GPS point as a circle, with the upper (north) hemisphere representing perceived cultural plant presence, in color as described above, and the southern hemisphere representing perceived human use ranking, also in color as described above. Note that the patterns of resulting red and yellow colors conform closely with Santiam Molalla use patterns named and described on Part 3 of this report.

Map 7. Index of GPS photo points in Owl Ridge Trails Project area.

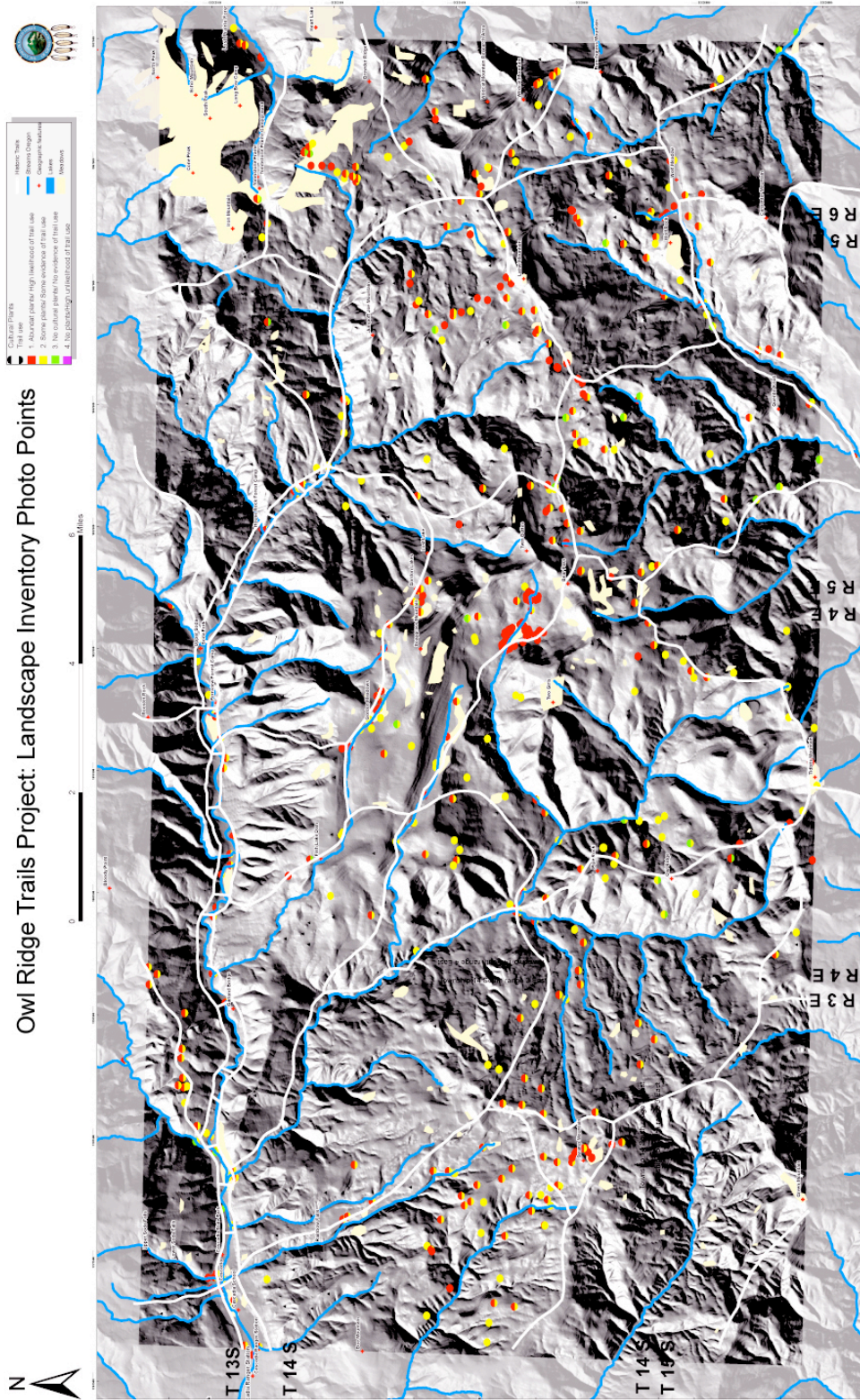


Table D1. Named GPS points with photo documentation and theoretical site-use rankings

Title	Easting	Northing	Elevation	P	X
181_River_Crossing	548283	4916354	1097	2	1
185_Fishing_Rock	549001	4916649	1103	2	1
186_Longbow_Gate	550420	4916721	1296	2	1
193_Purple_Salmonberry	551495	4914884	2975	1	1
195_Black_Creek	552437	4912220	3526	2	2
197_Beargrass	552917	4911818	3657	1	1
199_Red_Huckleberry	557584	4910420	3864	2	2
201_Two_Girls_Panorama	558899	4909203	4301	2	2
207_Bear_Pass	559320	4907828	4077	2	1
211_Beaver_Pond_Panorama	557297	4909622	3653	1	1
a001_Locked_Gate	543955	4907877	3503	2	1
a002_Waterhole	542964	4908232	3542	2	1
a003_Meadow	544921	4907270	4185	1	1
a005_Meadow	544773	4907527	4246	1	1
a006_Squirrel	544823	4907194	4186	1	1
a007_N_Meadow_View	544675	4907104	4253	1	1
a009_Pond	545030	4906606	4078	1	1
a011_Green_Mountain_Panorama	545094	4906365	4087	2	1
a021_Road_Block	545827	4907052	4012	2	1
a021a	545744	4908339	3654	2	1
a022_Swamp_Mountain	551128	4908450	2320	3	2
a023_Owl_Ridge_Panorama	551354	4904712	4356	2	2
a027_Washout	550817	4905479	2617	3	2
a028_Pine_Rock	551670	4905673	3377	3	2
a029_Pine_Rock	552437	4907053	3026	3	2
a032_Tidbits_Ridge	552283	4901825	4271	1	1
a033_Closed_Road	549904	4902677	3672	2	1
a033a	558569	4909098	4018	1	1
a034_Cherry_Tree	558670	4909161	4013	1	1
a036_Willow	558769	4909104	4041	1	1
a037_Meadow	558731	4909040	4041	1	1
a038_Spring_Source	558703	4908948	4037	1	1
a039_Pond	558665	4908864	4048	1	1
a040_Beargrass	558640	4908873	4042	1	1
a040a	558576	4908924	4023	1	1
a040b	558610	4909010	4052	1	1
a040c	558692	4909004	4059	1	1
a040d	558697	4909052	4059	1	1
a040e	558650	4909076	4033	1	1

a040f	558600	4909046	4032	1	1
a040g	558540	4909054	4029	1	1
a040h	558579	4909149	4058	1	1
a040i	558591	4908872	4022	1	1
a040j	557768	4908701	3731	1	1
a040k	557576	4908846	3713	1	1
a040l	557511	4909206	3718	1	1
a040m	557412	4909420	3663	1	1
a040n	557339	4909535	3639	1	1
a041_Beaver_Pond	557327	4909657	3617	1	1
a042_Meadow's_Edge	557345	4909711	3612	1	1
a042a	557404	4909734	3619	1	1
a043_Old-Growth_Stump	557430	4909734	3623	1	1
a043a	557487	4909681	3618	1	1
a043b	557452	4909660	3612	1	1
a045_Chittam	557492	4909626	3619	1	1
a045a	557539	4909636	3621	1	1
a045b	557630	4909608	3627	1	1
a045c	557684	4909671	3649	1	1
a045d	557737	4909662	3657	1	1
a045e	557806	4909577	3657	1	1
a046_Meadow	557754	4909520	3634	1	1
a047_Old_Stump	557860	4909485	3650	1	1
a047a	557948	4909298	3672	1	1
a048_Alder	557999	4909242	3684	1	1
a049_Gooseberry	557958	4909232	3675	1	1
a050_Huckleberry_Patch	557898	4909189	3686	1	1
a051_Meadow_Panorama	557800	4909167	3665	1	1
a051a	557833	4909083	3666	1	1
a051b	557775	4909059	3676	1	1
a051c	557727	4909071	3678	1	1
a051d	557679	4909129	3663	1	1
a056_Meadow's_Edge	557664	4909095	3665	1	1
a057_Animal_Den	557690	4908915	3684	1	1
a057a	557748	4908843	3693	1	1
a058_Meadow	557806	4908806	3705	1	1
a060_Owl_Creek_Mouth	550810	4909185	1635	3	1
a061_Oak_Trees	531054	4913911	1568	1	1
a064_Loon_Creek_Swamp	548080	4906043	2976	2	1
a065_No_Trespass	547688	4905633	3093	2	1
a068_Overgrown_Road	547051	4905964	3291	2	1
a069_Meadow	557241	4906330	4339	1	1
a073_Two_Girls_Panorama	556365	4906387	4094	2	2
a079_Ridge_Trail	556771	4904594	3798	2	1
a080_Road_Sign	556748	4904919	3816	2	2
a082_To_Tidbits_Mountain	556921	4904999	3842	2	1

a083a	557155	4905194	3832	2	2
a083b	557304	4905644	4007	2	2
a084_To_McKenzie_River	557535	4905942	4107	2	1
a086_Ridgeline_Prairie	558089	4906099	4224	2	1
a087_Two_Girls_Panorama	557992	4902642	3960	2	2
a093_Calapooia_Panorama	553169	4898783	4217	2	2
a096_Huckleberry	550467	4902175	3894	2	2
a097_Tidbits_Panorama	552636	4903652	4212	1	1
a106_Road_Block	552271	4903857	4357	3	1
a107_Tidbits	553191	4902424	4630	1	1
a109_Blue_Flower	553507	4902104	4631	2	2
a113_West	554147	4901772	5181	2	2
a116_Beargrass	554723	4901938	4736	1	1
a122_Ridgeline_Old-Growth	555587	4901882	4879	2	2
a123_Shasta_Fir	555830	4902524	4610	2	2
a125_Forest_Age_Classes	556596	4902571	4736	2	2
a127_Elk_Tracks	556906	4903932	4282	2	2
a132_Sign	546580	4900248	2344	2	1
a134_Campsite	558719	4911876	3906	2	1
a135_Bog_Site_Panorama	558595	4911742	3878	1	1
a143_Willow	558441	4911778	3918	1	1
a146a	558410	4911899	3963	3	2
a147_Stump	557856	4912554	4238	2	1
a148_Wet_Meadow	557620	4912779	4109	2	2
a151_Bracken_Fern	557261	4912668	4206	1	1
a152_Meadow_Panorama	557047	4912748	4177	2	1
a155_Meadow_Panorama	556183	4912700	4120	1	1
a162_Meadow	556055	4912812	4154	2	1
a163_Elk_Crossing	555905	4912693	4126	3	1
a165_Gordon_Meadows_Inlet	555749	4912745	4059	2	1
a166_Gordon_Meadows_Panorama	555694	4912807	4100	1	1
a171a	555236	4912918	4057	2	2
a171b	555506	4912701	4048	2	2
a171c	555201	4913197	4061	2	2
a171d	555464	4912986	4049	2	2
a171e	554615	4912590	4320	2	1
a171f	554416	4911282	3735	2	2
a171g	554318	4911282	3727	2	2
a171h	553617	4911535	3705	1	1
a171i	555091	4911034	3763	1	1
a172_Meadow_Panorama	554761	4913445	4039	1	1
a176a	554717	4913640	4048	1	1
a177_Scarred_Snag	552620	4913552	3840	3	2
a177a	552555	4913588	3815	2	2
a178_Road_Crossing_Trail	551923	4914355	3697	3	1
a217_Cascadia_Cave	543120	4916295	774	3	1

a220_Cascadia_East	541320	4916226	852	1	1
a222_Canyon_Creek_Mouth	543918	4916140	907	2	2
a223_Trout_Creek	551963	4961352	1245	2	1
a224_No_Trespassing	557264	4917206	1424	2	2
a225_Snow_Creek	565311	4915821	3601	3	1
a226_Wagon_Trail	568369	4916147	4238	3	1
a227_Iron_Mountain_Trailhead	567772	4915900	4108	2	1
a228_Dry_Creek_Bed	563524	4914806	2996	2	1
a229_Hanging_Meadow	560028	4908204	4261	1	1
a230_Horsefly_Panorama	564565	4908769	4543	1	1
a234_Private_Meadow	564386	4908544	4370	1	1
a235_370_Road	566607	4909902	4682	3	1
a236_Small_Creek	569049	4911872	4097	3	2
a237_Wet_Meadow	569318	4910414	4181	1	1
a238_Camp_Swine	568323	4908301	4041	1	1
a239_Wolf_Pond	568828	4905097	3616	1	1
a240_Mann_Creek	566317	4905958	2772	1	1
a242_Cook_Creek_Campsite	561292	4900080	1758	1	1
a243_Hole	565538	4904714	2488	2	3
a244_Cabin	566108	4905014	2695	1	1
a248_Wolf_Creek_Panorama	566126	4904957	2634	2	1
a914_Canyon_Creek_Panorama	543918	4916144	907	2	3
a925_Powderhouse	0544101	4916035	918	2	1
b015_Fishing_Rock	0548998	4916705	1269	2	1
b017_Bear_Pass	0559342	4907813	4137	2	1
b020_Road_636	0560325	4907867	4376	2	1
b022_Road_1516	0560074	4908553	4635	2	1
b027_Latiwi_Trail_Panorama	0560513	4908197	4314	2	1
b050_Twin_Butttes_Panorama	0560881	4908642	4183	2	1
b068_Intersection_1509_X_	0560872	4908328	4251	2	1
b070_Twin_Butttes_Panorama	0561355	4908536	4097	2	2
b078_Intersection_1509_X_2044	0561640	4908479	4015	3	1
b081_Road_535_Sign	0561346	4908663	3966	2	2
b082_Beargrass	0561459	4908717	4002	1	1
b085_View	0560786	4908737	4179	1	1
b210_Intersection_260_X_2044	0561423	4909143	4045	2	1
b212_Twin_Butttes_Panorama	0562497	4908022	3963	2	2
b223_Intersection_1509_X_	0562549	4907928	3963	2	1
b229_View	0562745	4908061	4018	2	1
b234_Headwaters_Panorama	0563146	4908311	4009	2	3
b244_Road_545	0563322	4908146	4048	2	1
b245_Water	0563682	4907800	4153	2	1
b247_Alder	0563754	4907896	4146	1	1
b250_Wolf_Rock	0534085	4907741	4238	1	1
b253_Blazed_Tree	0564029	4907929	4199	1	1
b255_Intersection_1509_X_	0564127	4908043	4212	1	1

b260_Meadow	0564509	4908330	4297	1	1
b262_Meadow_Panorama	0564404	4908570	4376	1	1
b273_Intersection_1509_X_1517	0564987	4908806	4481	2	1
b274_Intersection_805_X_565	0565238	4909121	4534	2	1
b278_Meadow	0565325	4909070	4524	2	1
b281_Old_Clearcut	0565808	4909181	4504	2	1
b283_Meadow	0566460	4909776	4501	1	1
b284_Spring	0566606	4909864	4793	2	1
b286_Intersection_1509_X_370	0566606	4909864	4793	2	1
b288_Intersection_1509_X_	0567450	4909985	4534	2	2
b289_Intersection_1509_X_15	0567746	4909900	4455	2	1
b291_Meadow	0568668	4910636	4284	2	1
b292_Latiwi_Mountain	0568502	4911093	4291	2	1
b294_Intersection_15_X_1598	0569527	4912930	3986	2	1
c001_Hackleman_Entrance	0572250	4916722	3559	2	1
c005_Purple_Mushroom	0572206	4916592	3517	2	1
c013_Trail_Intersection	0571922	4916183	3618	1	1
c014_Brake	0571911	4916167	3366	1	1
c017_Indian_Creek	0571958	4916159	3513	1	1
c018_Intersection_15_X_055	0572627	4916890	3474	2	2
c019_Tombstone_Pass	0568386	4916182	4222	2	1
c020_Intersection_15_X_20	0567420	4916022	4137	2	2
c022_Old_Trail	0568887	4913723	4205	2	1
c024_Old_Trail	0568967	4913692	4058	2	1
c026_Old_Trail	0569011	4913816	4251	2	1
c027_Old_Trail	0568960	4914014	4255	2	2
c028_New_Trail	0569073	4913990	4166	2	1
c029_Browder_Ridge_Trailhead	0569254	4913741	4110	2	1
c038_Mushrooms	0569105	4914196	4242	2	2
c040_Brake	0569243	4914348	4425	1	1
c042_Brake_Panorama	0569256	4914585	4491	1	1
c053_Brake_Panorama	0569248	4914855	4803	1	1
c061_Brake_Panorama	0569549	4914896	4963	3	1
c063_Intersection_15_X_1598	0569521	4912956	3900	2	2
c081_Hangout_Spot_Panorama	0569613	4915019	5203	3	1
c082_View_Panorama	0569571	4915038	5259	3	1
c096_Off_Trail	0569718	4914921	5081	2	1
c097_Browder_Ridge_Trail	0569803	4914829	5055	2	2
c105_Unmarked_Intersection	0569809	4912548	3818	2	2
c110_Wildcat_Mountain	0571496	4912067	3612	2	1
c115_Water	0569923	4912427	3815	1	1
c119_Wildcat_Mountain	0570504	4911787	3704	1	1
c122_Turnaround	0570692	4911804	3786	2	1
c124_Douglas-fir_Plantation	0568480	4911094	4245	2	1
c127_Meadow	0568859	4910600	4212	1	1
c129_Old_Trail	0569173	4910750	4127	2	1

c130_Road_Intersection	0569340	4910447	4202	2	2
c131_Intersection_2655_X_590	0570936	4909235	4422	2	2
c133_Wildcat_Panorama	0571785	4908791	4698	2	1
c150_Wildcat_Panorama	0571680	4908902	4721	2	1
c164_Wolf_Rock	0571496	4909229	4914	2	1
c172_Wildcat_Trailhead	0571452	4909289	4983	2	1
c173_Intersection_15_X_	0569505	4909757	4048	2	2
c175_Old_Trail	0569714	4909864	4094	2	1
c176_Intersection_797_X_	0570169	4908412	3809	2	2
c177_Cadenza_Creek_Sign	0570539	4908304	3746	2	1
c178_Campsite	0568141	4908194	4002	2	1
c182_Water	0568029	4908109	3936	2	1
c189_Bobcat_Rock	0567538	4907446	3795	2	3
c197_Beargrass_Meadow	0568337	4908337	4009	1	1
c199_Bunchgrass_Mountain	0569549	4906949	3572	2	2
c200_Intersection_15_X_	0569642	4905902	3339	2	1
c201_Intersection_15_X_618	0568976	4905912	3307	2	2
c207_Wolf_Rock_Panorama	0568356	4906340	3549	2	1
c211_Wolf_Rock_Beauty_Shot	0568245	4906382	3576	2	2
c213_Road_745	0567726	4906200	3717	2	1
c214_Wolf_Rock	0567562	4906211	3700	2	2
c227_Lily_Pond_Panorama	0568509	4905772	3352	1	1
c229_Road_630	0568236	4906054	3362	2	1
c231_Road_631	0568338	4905955	3402	1	1
c233_Road_612	0566667	4905561	2982	2	2
C235_Wolf_Rock	0567532	4907003	3536	2	1
c236_Road_612	0567205	4906425	3211	2	1
c239_Mann_Creek_Culvert	0566270	4905949	2759	2	1
c242_Wolf_Rock	0565831	4904875	2644	2	2
c243_Intersection_15_X_1516	0563718	4902198	2286	2	3
c244_Five-Way_Intersection	0569659	4905810	3280	2	1
c248_Intersection_1506_X_1508	0568793	4905509	3408	2	1
c249_Wolf_Rock	0568272	4905410	3320	2	1
c251_Water	0568028	4905152	3330	2	1
c252_Intersection_1508_X_426	0565016	4903304	2417	1	1
c254_Road_Block	0564870	4903010	2309	2	1
c257_Road_1508	0564981	4903565	2358	2	1
c262_Road_1508	0567139	4904826	3087	2	1
c265_Wolf_Rock	0569227	4907422	3726	2	1
c274_Road_370_Panorama	0566372	4910042	4478	1	1
c284_Jump_Off_Joe_Panorama	0566066	4910605	4402	1	1
d001_Dead_Tree	0565615	4911203	4583	2	1
d004_Fall_Colors_Panorama	0565687	4911199	4629	2	1
d018_Road_351	0565628	4911824	4330	2	1
d019_Douglas-fir_Plantation	0565858	4912133	4268	1	1
d022_Jump_Off_Joe_Panorama	0566382	4912303	4183	1	1

d032_Forest_Litter	0566622	4912274	4176	2	1
d034_Conifer_Reprod	0565950	4912064	4202	2	2
d035_Conifer_Forest	0565242	4911635	4415	2	3
d036_Old-Growth_Pine	0565363	4911406	4333	1	1
d037_Brake_Panorama	0565703	4910996	4491	1	1
d050_Intersection_367_X_	0565738	4910769	4497	2	2
d051_Road_367	0564436	4911139	3838	2	4
d052_Road_367	0564807	4910877	3786	2	4
d053_Road_367	0565267	4910605	4018	2	4
d054_End_Of_Road_Panorama	0564987	4911457	4176	2	2
d063_Intersection_422_X_340	0567835	4911425	3976	2	1
d065_Wetland_Meadow	0567650	4910834	4084	1	1
d069_Latiwi_Mountain	0566026	4910353	4386	1	1
d070_Bottomland_Prairie	0566092	4909879	4310	1	1
d074_Bottomland_Prairie	0566092	4909879	4310	2	1
d075_Latiwi_Mountain_Panorama	0565414	4909879	4094	2	3
d085_Latiwi_Creek	0565770	4909487	4205	2	1
d088_Off-Road_Vehicle	0558219	4906723	4248	3	3
d090_Road_529	0557969	4906260	4310	3	3
d093_Bracken_Fern	0558188	4906722	4317	3	3
d094_Meadow	0558577	4906452	4455	2	1
d096_Intersection_1509_X_1513	0559201	4907069	3992	1	1
d099_Twin_Butttes_Panorama	0561415	4908526	4005	2	3
d124_Road_2044_Panorama	0562330	4909820	4248	2	2
d127_Old_Road	0561317	4910328	4114	2	1
d128_Conifer_Reproduction	0561000	490996	4261	2	2
d135_Twin_Butttes	0560401	4910889	3710	1	1
d137_Gordon_Lakes_Trailhead	0558974	4911624	3969	2	1
d138_Gordon_Lake	0558760	4911803	3618	2	1
d139_Gordon_Lakes_Area	0558184	4911789	3874	2	1
d145_Gordon_Meadow	0558453	4911996	3858	2	1
d150_Possible_Pass	0561079	4911958	3277	2	1
d151_Road	0558534	4909398	4279	2	1
d154_Intersection	0558312	4909025	3996	2	1
d157_Water	0558117	4910357	4160	2	1
d161_Road_475	0557506	4910395	3835	2	2
d163_Intersection_365_X_367	0555977	4910822	3897	2	1
d164_Logging	0554830	4911907	4327	2	2
d166_Road_367	0555364	4912290	4376	2	3
d169_Sheer_Edge	558060	4910609	4068	2	3
d173_Intersection_2032_X_428	0551028	4913814	3106	2	2
d176_Intersection_2044_X_2032	0550575	4912787	3320	2	1
d177_Road_145	0552917	4911790	3635	2	2
d179_Two_Girls	0552507	4910767	3963	2	2
d181_Intersection_1498_X_145	0552137	4911479	3825	2	1
d182_Mountaintop_Panorama	0552014	4910697	3723	2	1

d187_Rocky_Plateau_Panorama	0551878	4910772	3805	2	2
d198_Unkown_Road	0553543	4910840	3448	2	1
d199_National_Forest_Boundary	0554086	4910500	3116	2	2
d201_Intersection_2024_X_145	0553643	4909533	3008	2	2
d202_Two_Girls_Panorama	0555068	4910021	3179	2	2
d205_Intersection_2024_X_250	0556036	4409936	3185	2	2
d207_Two_Girls_Creek	543918	4909940	3254	2	1
d210_Intersection_250_X_251	0556174	4909346	3330	2	2
d212_Forest_Panorama	0556128	4909216	3536	2	2
d224_Intersection_2024_X_210	0553272	4908532	2309	2	1
d229_Creek	0553588	4908759	2372	2	1
d231_Road_Block_Panorama	0554089	4908457	2867	3	3
d239_Creek_Panorama	0551289	4909019	1732	2	1
d248_Intersection_2022_X_2026	0550948	4909333	1679	2	2
d249_Intersection_2026_X_300	0550851	4109106	1699	2	2
d250_Road_300	0551131	4908435	2329	2	1
d252_Road_300	0551887	4907594	3008	2	1
d253_Two_Girls_Panorama	0552435	4907036	3021	2	2
d258_Intersection_300_X_307	0552242	4906745	2998	2	1
d261_Intersection_307_X_312	0552038	4906767	3152	2	2
d263_Road_312	0551677	4906976	3270	2	2
d266_Road_312	0552446	4906260	2910	3	3
d268_Owl_Ridge_Panorama	0552565	4905976	2860	2	1
d275_Pass	0552745	4905592	2749	2	2
d277_Intersection_2022_X_300	0553169	4905699	2644	2	2
d278_Intersection_2022_X_250	0553274	4905547	2729	2	2
d280_Road_300_Camp	0552613	4904884	3507	2	3
d281_Water	0553134	4906173	2375	2	2
d283_Water	0553155	4906545	2102	2	3
d285_Canyon_Creek	0552575	4908170	1814	2	2
e001_Soda_Creek	0541417	4916425	892	2	1
e004_Campground_Panorama	0541509	4916369	994	2	1
e0115_Soda_Creek_Crossing	0541396	4916574	908	1	1
e017_Cabin_Creek	0541167	4916263	849	1	1
e018_Cascadia_North_Trail	0541135	4916482	938	1	1
e020_Gate	0539891	491558	810	2	1
e023_Dump_Panorama	0539734	4915611	800	2	1
e038_Shot_Pouch_Butte	0539504	4915414	757	2	1
e044_Mouse_Creek_Panorama	0539712	4915252	859	2	1
e047_Cascadia_Post_Office	0540860	4915914	872	2	1
e050_Dobbin_Creek_Panorama	0541365	4916214	793	2	1
e065_Swimming_Hole	0540686	4916032	862	2	1
e067_Wolf_Creek	542727	4916019	990	2	2
e073_Canyon_Creek	0543976	4916087	839	2	2
e074_Elephant_Mountain	0543920	4915972	935	2	1
e075_Meadow_Panorama	0544555	4916442	948	2	1

e080_Waterfalls	0544625	4916523	895	2	1
e085_South_Santiam_River	0544544	4916476	918	2	3
e088_Moose_Creek	544925	4916621	994	2	1
e089_Intersection_2025_X_2027	545007	4916726	1013	2	2
e090_Moose_Creek_Beheaded_Salmon	0544789	4916979	984	2	3
e094_Moose_Creek_Campsite	054572	4917829	1125	2	1
e095_Moose_Creek	0546752	4918827	1092	2	1
e096_Large_Bench	0545179	4916965	1249	2	1
e097_530_Gate	0545744	4917289	1394	2	2
e097_Intersection_541_X_	0546162	4917248	1650	2	2
e099_Road_539	0546131	4917331	1774	2	1
e101_Road_541_Unknown_Plant	0546176	4917470	1738	2	1
e104_Ridgeline_Crossing	0546371	4917362	1725	2	1
e110_Road_2027_Spring	0546861	4917414	2253	2	1
e111_Intersection_2027_X_705	0547094	4917400	2040	2	1
e112_Road_2027_Panorama	0547989	4917359	2129	2	1
e122_Ridgeline_Road	0548674	4918270	2381	2	1
e125_Ridgeline_Meadow	0548940	4918076	2358	2	1
e127_Ridgeline_Intersection	0549108	4918300	2106	2	1
e130_Old_Bridge	0550648	4916660	1158	2	1
e131_Meadow	0551477	4916548	1046	2	1
e132_River_Crossing	0551718	4916338	1056	2	1
e135_Trout_Creek	0551994	4916351	1210	2	1
e137_Closed_Gate	0552444	4916294	1660	2	1
e138_Old_Santiam_Wagon_Road	0554137	4916573	1410	2	1
e141_Rooster_Rock	0554391	4916526	1384	2	1
e142_Intersection	0554882	4916672	1484	2	1
e145_Fernview_Intersection	0555528	4916949	1259	2	1
e149_Old_Wagon_Road_Crossing	0555418	4916817	1427	2	1
e151_Rooster_Rock_Trailhead	0555952	4917003	1345	2	2
e152_Road_2041	0556790	4917312	1466	2	2
e156_Soda_Fork_Bridge	0558178	4917998	1617	2	1
e157_House_Rock_Campground	0560117	4915715	1601	2	1
e159_Bridge_Crossing	0561042	4914975	1771	2	1
e160_Wagon_Road_Trailhead	0561114	4915030	1811	2	1
e161_Sevenmile_Trailhead	0561305	4914824	2037	2	1
e167_Jump_Off_Joe_Panorama	0563450	4913831	2372	2	1
e178_Madrone_Panorama	0563393	4913786	2349	2	1
e186_Trail_Marker_5	0563437	4913858	2362	2	1
e189_Sevenmile_Trail	0563019	4913905	2112	2	2
e191_Sevenmile_Trail	0562599	4913830	2125	2	2
e195_Sevenmile_Trail	0561763	4914203	2175	2	2
e199_Sevenmile_Trail	0561703	4914486	1991	2	2
e200_Landmark	0560770	4913730	2381	2	2
e201_Reprod_Panorama	0561424	4913358	2457	2	2
e204_Old_Cascades_Panorama	0562003	4911741	3372	2	2

e214_Quentin_Knob_Panorama	0559345	4906315	3779	2	1
e215_Quentin_Knob	0559496	4906050	3799	2	2
e216_Road_514	0559526	4905909	3769	2	1
e217_Road_514	0560428	4905440	3648	2	1
e218_Reprod_Panorama	0560681	4904242	3287	2	2
e223_Wolf_Rock	0561238	4904302	3093	2	1
e226_Viewpoint	0561244	4903499	3264	2	3
e228_View	0561584	4902928	3261	2	3
e231_Scree	0562293	4901954	2309	2	3
e232_Intersection_15_X_1513	0562106	4900675	1784	2	1
e233_Cook_Creek	0562474	4901035	1827	2	1
e236_Road_1516_Panorama	0563289	4903742	2805	2	1
e240_Spot_Fire	0562351	4904687	2883	2	2
e242_Road_1516	0563643	4906521	3080	2	1
e248_Cave	0563740	4906486	3428	2	3
e255_Rock_Cutbank	0563206	4906873	3293	2	3
e256_Giant_Rock	0562384	4907080	3651	2	2
e261_This_Rock_Has_To_Have_A_Name	0562387	4907322	3920	2	1
e262_Road_1516_Panorama	0562561	4907809	3923	2	2
e265_Intersection_15_X_1516	0563675	4902252	2250	2	1
e267_Road_2054	0572940	4902843	2404	2	3
e269_View	0572479	4903271	2427	2	3
e270_Conifer_Reprod	0571726	4904713	2919	2	2
e271_Ridgeline_View	0571522	4904877	2946	2	1
e273_Road_2654	0570209	4907942	3687	2	1
e275_Dobbin_Creek_Road	0541401	4915104	1207	2	2
e276_Blocked_Road	0542960	4913259	1748	2	1
e277_Road_750	0543033	4913145	1811	2	1
e278_Intersection_810_X_	0543429	4912544	2011	2	1
e279_Logged_Lookout_Panorama	0544328	4913018	2237	2	1
e290_Road	0544231	4911043	2716	2	1
e291_Intersection	0544242	4910668	2680	2	1
e293_Spring	0544194	4910506	2890	2	2
e305_Swamp_Mountain_Panorama	0543396	4910239	3244	2	1
e311_Swamp_Mountain_Panoramas	0543633	4910326	3257	2	1
e322_Ridgeline_Trail	0543499	4910089	3349	2	1
e324_View	0543491	4909762	3467	2	2
e327_Intersection	0544090	4909330	3454	2	1
e328_Intersection_SW-500_X_	0544355	4909084	3441	2	1
e331_Meadow	0544547	4907962	3979	2	1
e338_Road	0544559	4907595	XXX	2	1
e345_Boomer_Panorama	0544667	4907591	4189	1	1
e353_Road_SW-1560	0544822	4907499	4268	1	1
e364_Road_SW-1550_Panorama	0544912	4907314	4209	2	1
e366_Swamp_Mountain_Panorama	0544689	4907097	4245	1	1
e378_Road	0544675	4908306	3717	2	1

e379_Locked_Gate	0543968	4907935	3628	2	1
e382_Quarry	0543913	4908102	3595	2	2
e383_Water_Source_Intersection	0543717	4908344	3320	2	2
e390_Water	0543606	4908174	3425	2	1
e391_Water_Storage	0542961	4908216	3549	2	2
e397_Water	0543455	4908094	3461	2	2
e398_Ripe_Berries	0543703	4908640	3280	2	1
e404_Water_Source_Intersection	0542723	4909802	2939	2	2
e405_Intersection_SW-370_X	0542666	4909208	2808	2	1
e406_Blocked_Road	0543312	4908564	3162	2	1
e410_Quarry	0541601	4909297	2877	2	2
e411_Old_Road_Intersection	0540906	4908917	2995	2	1
e414_Intersection	0540981	4909429	2870	2	1
e416_Shrub_Opening	0540487	4909537	2703	2	2
e419_Road_390E_Turnaround	0539998	4909572	2778	2	2
e421_Intersection_390_X	0543026	4910821	2982	2	1
e423_Intersection	0542357	4911139	2893	2	2
e425_Intersection	0542271	4911037	2913	2	1
e427_Cattail_Marsh	0542230	4911017	2890	1	1
e428_Road_Block	0540614	4911098	2513	2	2
e429_Upland_Prairie_Panorama	0541315	4910539	2460	1	1
e435_Intersection_SW-360_X_SW-600	0544860	4909825	3421	2	1
e437_Intersection_SW-1200_X	0545973	4909362	3605	2	1
e438_Road_1200_View	0546822	4909483	3618	2	2
e441_Ponderosa_Pine_Panorama	0546923	4909759	3651	2	2
e450_Intersection_CY-300_X	0545953	4908881	3618	2	1
e451_Intersection_CY-300_X_CY-332	0546377	4908412	3523	2	1
e452_Road_390	0546621	4908838	3257	2	1
e453_Intersection_CY-300_X	0548119	4908987	2795	2	1
e461_Intersection	0548481	4908632	2568	2	2
e462_Intersection_300_X_CY-220	0548728	4908040	2454	2	1
e463_Boundary_Creek	0548621	4907862	2349	2	2
e467_Intersection_330_X_300	0549001	4907519	3467	2	1
e469_Intersection_2026_X_280_X_320	0549349	4907578	2349	2	1
e471_Road_2026	0550052	4907475	2211	2	1
e472_Pine_Rock	0550371	4907702	1860	2	2
e476_Water	0550550	4908699	1702	2	1
e477_Intersection_2026_X_2022_Panorama	0550757	4909114	1407	2	1
e489_Creek	0550875	4909163	1630	2	1
e491_Road_Closed	0549715	4911628	1499	2	2
e493_Owl_Creek_Mouth	0550779	4909195	1722	2	1
e494_Evening_View_Panorama	0552271	4910627	2568	2	2
Total = 495 GPS Points	Easting	Northing	Elevation	P	X