Tiller Pre-Contact Reference Condition Study

Chapter I. Introduction: Purpose, Background, and Setting

Project Purpose

The purpose of this study is to produce a reliable landscape-scale description of late precontact (pre-1826; ca. 1800) reference forest conditions for the eastern portion of present-day Tiller Ranger District of the Umpqua National Forest in Douglas County, Oregon. The primary intended use of this information is to help update Community Wildfire Protection Plans. The findings from this study will assist Douglas County in planning for mitigation of landscape-scale fire hazards, forest restoration, cultural resource protection, and other applications in which knowledge of past forest conditions may prove useful and which have direct relevance to wildfire protection planning.

The basic research questions posed by this project were well-stated by Ken Carloni in his 2005 PhD dissertation (Carloni 2005: *ix*):

> President George W. Bush's program for federal forest lands dubbed the "Healthy Forest Restoration Act" has recently been passed by congress, but its implementation is still being actively debated. The title of this act, however, begs an important question: *To what set of conditions should we "restore" forests?* If forests are indeed in an "unhealthy" state at present, then what were the "natural" native forests of southwestern Oregon like and what forces kept these ecosystems "healthy" in the past? What changes in forest structure now cause them to spawn "uncharacteristic" fires? And most pragmatically, what can studies of current and past fire and forest patterns contribute to future management decisions?

Douglas County Commissioner, Joseph Laurance, a key visionary and sponsor of this project, provided a partial answer to Carloni's questions during his testimony to a Congressional subcommittee of The House Natural Resources Committee in Washington, DC, on July 15, 2010 (see Appendix A):

> Fire Regime Condition Class (FRCC) 1 is similar to the forest which European explorers first found here. That forest had been modified by fire for more than 6 thousand years to provide the native inhabitants with what were then life's necessities. These included abundant wild game from the most productive and diverse wildlife habitat ever known on this continent. Similarly, the regular burning of competing vegetation permitted propagation of nut bearing trees and other food producing plants. Additionally, the historic "Healthy Forest" promoted pristine rivers, streams, and lakes that provided an abundant harvest of fish and waterfowl. Within FRCC 1 the risk of losing key ecosystem components to fire is low, while vegetation species composition, structure, and pattern are intact and functioning within the natural historic range.

With the recent a-historical advent of large-scale wildfires to the South Umpqua headwaters landscape -- including the 69,000-acre Tiller Complex Fires in 2002 and the 10,600-acre Boze Fire and 6,100-acre Rainbow Creek Fire in 2009 (see Chapter IV) – it has become increasingly important that planning efforts be tailored to prepare for these types of events, to address the millions of dollars in damages and future risks to Douglas County families, communities, and wildlife which they create, and to reduce the future likelihood of these types of occurrences. Those are among the primary objectives of Community Wildfire Protection Plans, and to provide aid to the planning process is the purpose of this project and research.

Project Background

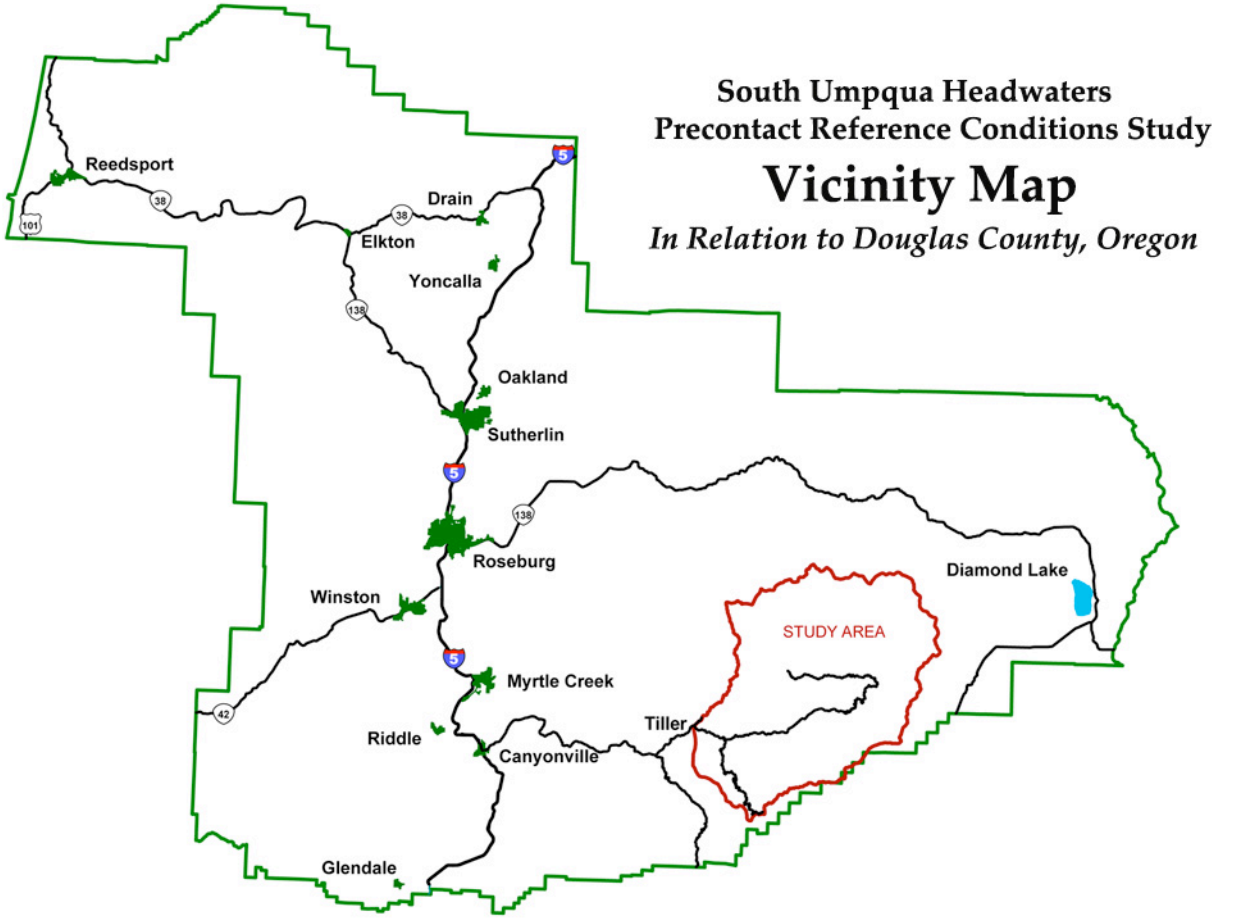
This project had its genesis in conversations involving Commissioner Laurance and Javier Goirgolzarri, Resource Management Services, LLC (RMS); in meetings of the Douglas County Forest Council and with members of Communities for Healthy Forests; in discussions and meetings with Forest Supervisor Cliff Dils and members of the Umpqua National Forest staff; and with local forest industry leaders, Cow Creek Tribal representatives, private landowners, concerned citizens, and forest scientists. As a result of these conversations, meetings, and discussions, in January 2009 strategic planning for the "South Umpqua Headwaters Pre-contact Reference Condition Study" was initiated with representatives of Oregon Websites and Watersheds Project, Inc. (ORWW) and others with knowledge and experience in conducting the types of research needed to determine and characterize historical conditions of local forestlands – particularly those areas perceived to be at increasing risk of catastrophic-scale wildfire.

On May 1, 2009, formal application for funding the study was made as a request to the Douglas County Board of Commissioners for funds under the provisions of Title III of the Secure Rural Schools and Community Self-Determination Act of 2007, adopted as an amendment to the Emergency Economic Stabilization act of 2008 (PL 110-343). The project application was approved for funding by the Douglas County Board of Commissioners on June 17, 2009. In the following months of September and October, the Boze Fire and Rainbow Creek Fire took place within the study area boundaries (see Map 1.01; Chapter IV); on December 9, 2009, the grant and project administration was assigned to the Southwest Oregon Resource Conservation and Development Council (SWORC&D) to oversee and administer the grant; RMS was subsequently selected as the contractor to conduct and oversee the study; and final plans were made with ORWW to formally begin contracted project research activities.

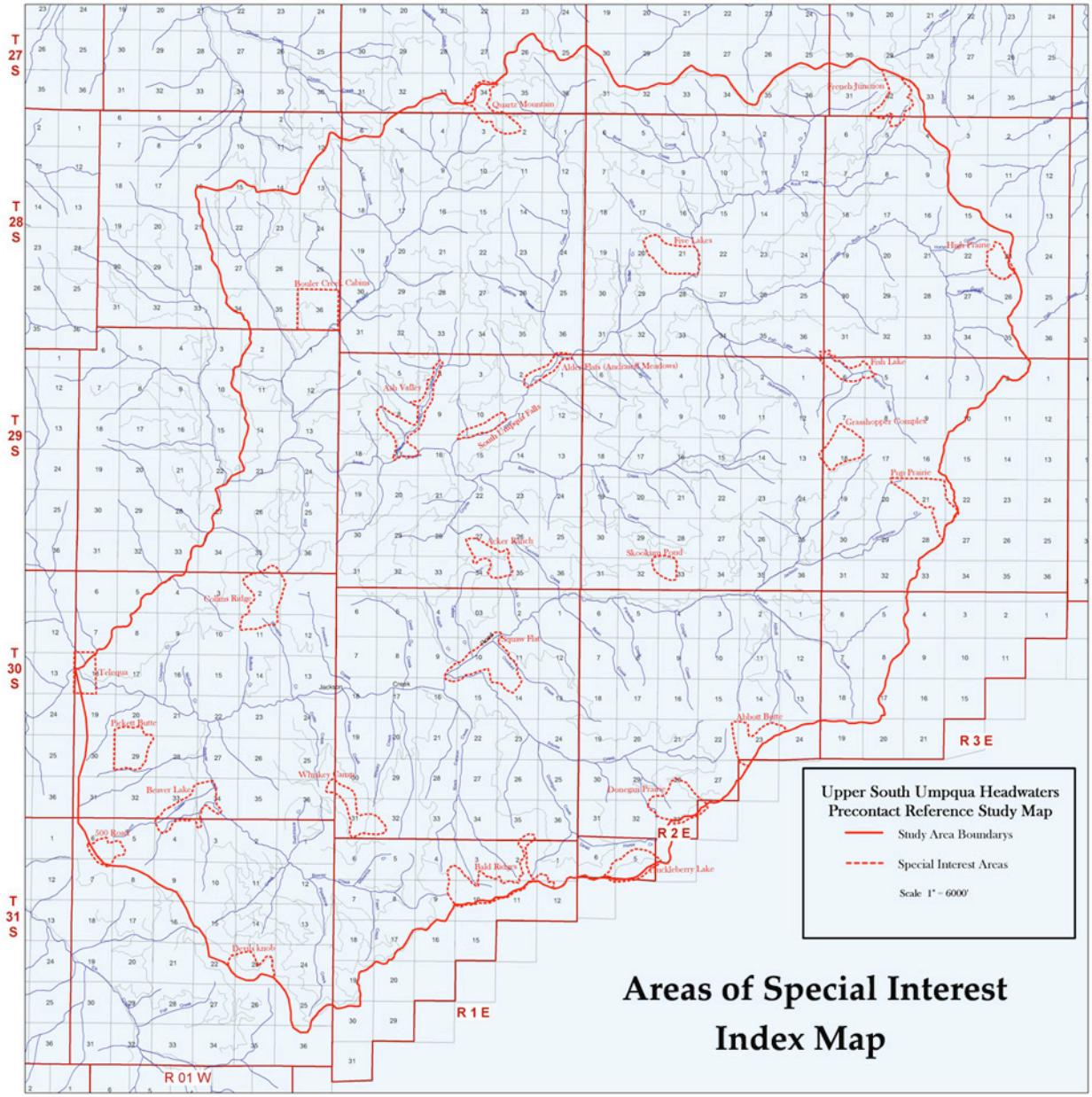
This report summarizes project research actions and findings, and represents successful completion of the study by ORWW during the 2010 calendar year.

Location of the Study Area

The study area is in Douglas County, Oregon (see Map 1.01), on the western slope of the Cascade Mountains, and extends from the Cascade Crest at elevations greater than 6,000 feet, westward to the confluence of Jackson Creek with the South Umpqua River at approximately 1,100 feet elevation. The southern boundary of the study is the watershed line between Jackson Creek and Elk Creek and the Rogue River; the eastern boundary is the Cascade Crest; the northern boundary is the watershed line between the South Umpqua and North Umpqua rivers; and the western boundary is the South Umpqua River and the watershed line between Boulder Creek and Dumont Creek. The area is 232,000 acres in size, mostly contained within the Tiller Ranger District of the USDA Umpqua National Forest. Significant private lands also exist in the study area, with the majority of these being situated at lower elevations toward the western boundary, and primarily used for purposes of farming, ranching, or timber production. All land is located within Tsp. 27 S. to Tsp. 31 S.; and Rng. 1 W. to Rng. 3 E. (See Map 1.02).



Map 1.01 Location of the study area boundaries in relation to Douglas County, Oregon.



Map 1.02 Legal boundaries of project study area, named creeks, and Areas of Special Interest.

Research Time Period

The time period for this study is given as "precontact time": that is, the period of human history before written eyewitness accounts of the land and people were first documented (see Chapter III); also defined as the period of time before native Oregon people made first direct or indirect contact with European-based cultures. For purposes of this project, that point in time (the first written eyewitness accounts of such contact) will be 1826: the year in which David Douglas provided a written record of people he

encountered and sugar pine he measured on October 26, several dozen miles upstream from present-day Elkton, Oregon (Douglas 1959: 230-231); and in which Alexander Roderick McLeod of the Hudson Bay Company described his entry into Lookingglass Valley -- tributary to the South Umpqua River -- in his daily journal on December 16 (Davies 1961: 1961).

Therefore, for purposes of this report, "precontact time" will be the period of human history in the study area before 1826, and "historical time" will be from 1826 to the present. Because this project calls for descriptions of "precontact forest conditions" – a period of time thousands of years in length, during which forest conditions changed dramatically many times – we have focused the majority of our research to "late precontact time," which we will define as the 1775 to 1825 time period (or, "ca. 1800").

Fieldwork based on tree ring counts (see Appendix B) can be reasonably precise to a given year, therefore the year 1825 is used to represent precontact time in those instances. To counterbalance the 50-year period described as late-precontact time (1775 to 1825; ca. 1800), the subsequent 50 years (1826 to 1875) will occasionally be referenced as "early historical time."

Climate

For general purposes of this research, climate appears to have been relatively stable for the study area for the past several hundred years, or longer. For example, Graumlich uses regional tree-ring analyses of precipitation reconstructions from 1675 to 1975 show consistent regional patterns of seasonal variations of cool weather precipitation and episodic droughts for that time period (Graumlich 1987: 26-28). In their authoritative work on the topic of global climate change during the past 500 years, Bradley and Jones (1995: 655) cite Fritts and Shao's analysis of tree-ring data over five North American regions to conclude: "Average conditions from 1602-1900 were warmer and drier over most of the western United States compared to the period since 1900." Pollen studies, other fossils, and glaciation data provide additional evidence of relatively stable climatic patterns of trees and other vascular plants in southwest Oregon over the past 4,000 years (Hansen 1947: 118-120).

Although there are no weather stations in the study area (and none have ever been located there), Taylor and Hannan (1999: 57) report:

> As is the case in the rest of western Oregon, most precipitation in Zone 3 ["Southwestern Interior"] falls during the months of November through March . . . Perhaps the wettest area in Zone 3 is in the remote mountainous area east of Roseburg near Quartz Mountain. Although precipitation data in that area are scarce, it has been estimated that some of the highest peaks receive in excess of 120 inches of rain per year.

Geology

Map 1.03 shows the basic geological history of the study area. It is interesting to note the relatively strong correlations between this history and the subsequent ca. 1800 vegetation patterns shown in Chapters VI, VII, and VIII; but both patterns seem to be more a function of elevation than of soil type. Formation history and weathering of the volcanic soil and rocks in Map 1.03 correlate fairly well (but do not necessarily demonstrate a causal effect) with subsequent forest type patterns; instead, they seem to be more a function of cultural fire history and elevational differences in seasonal weather patterns than any type of slope or nutrient limitation (see Chapter VIII).

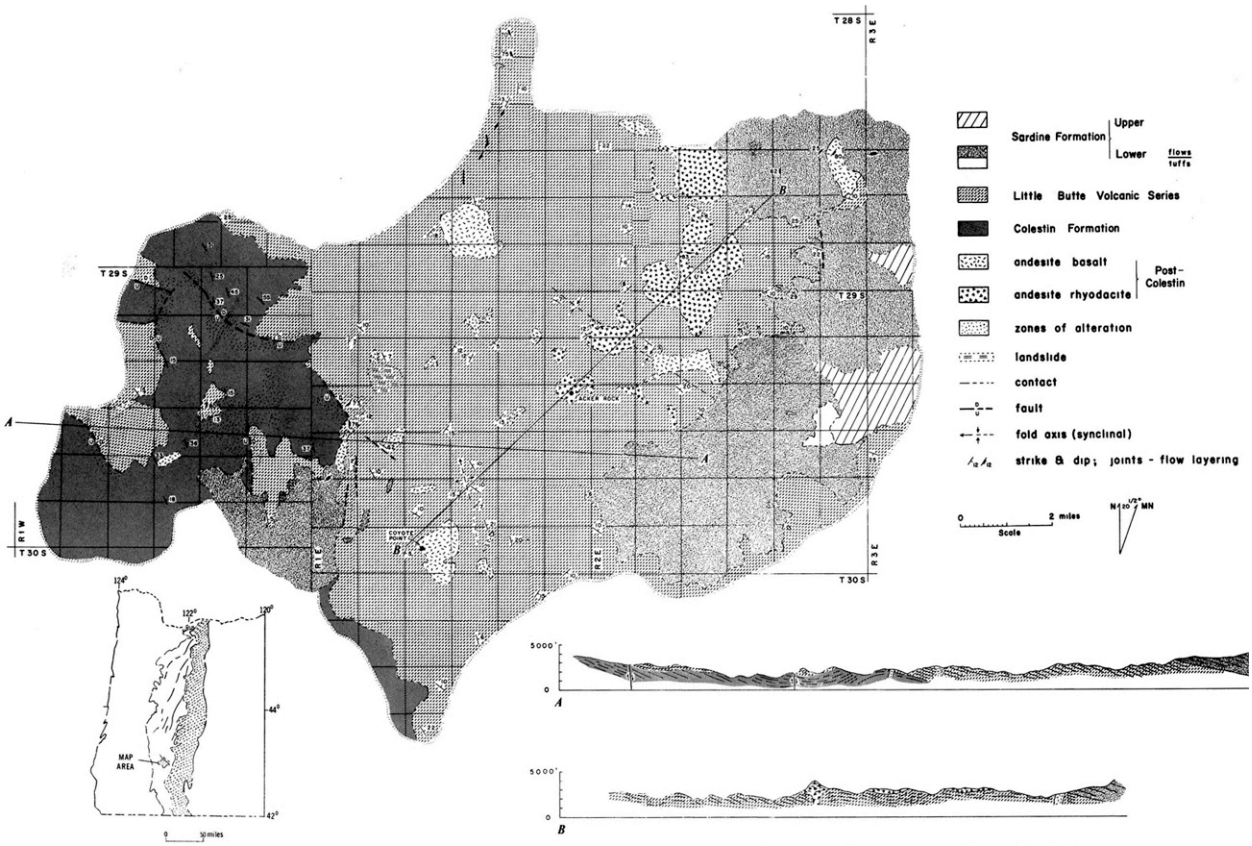


Plate 1. Geologic map of the South Umpqua Falls region, with index showing location of the map area. Shown also in the index are traces of axial planes of folds, taken in part from Peck and others (1964).

Map 1.03 Geology of South Umpqua headwaters (Kays 1970: 89).

Table 1.01 shows a variety of geological formations within the study area boundaries, as well as at least one indicator of how seasonal rain-on-snow events (such as occurred the first few days of June, 2010) can shape upland dissection of study area slopes, and directly contribute to flooding in adjacent lowland areas.

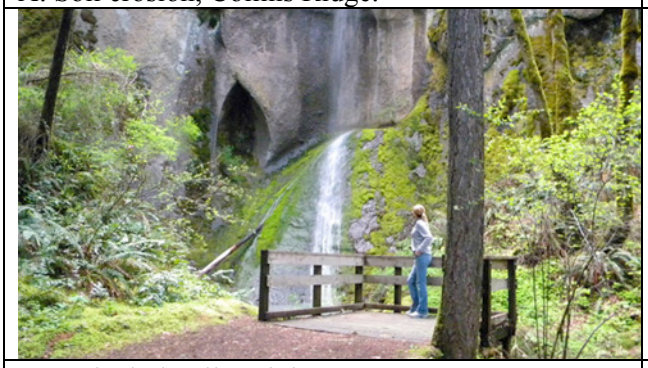
	
A. Soil erosion, Collins Ridge.	B. Large boulder, 27 Road.
	
C. Cathedral Falls, Highway 46.	D. Landmark rocks, 2938 Road intersection.
	
E. Rock formation, Acker Rock.	F. Rocky Ridge, Tsp. 28 S., Rng. 3 E.
	
G. Lava flow, Buckhead Mountain (note person).	E. Prong Creek floodwaters, June 1, 2010.

Table 1.01 Typical geological formations of the South Umpqua headwaters study area.