Using Oral Histories to Document Changing Forest Cover Patterns: Soap Creek Valley, Oregon, 1500-1999

by

Bob Zybach

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements of the
degree of

Master of Arts in Interdisciplinary Studies

Presented March 5, 1999
Commencement June, 2000

AN ABSTRACT OF THE THESIS OF

Bob Zybach for the degree of Master of Arts in Interdisciplinary Studies in Forest Science, Anthropology. and Anthropology presented on March 5, 1999. Title: Using Oral Histories to Document Changing Forest Cover Patterns: Soap Creek Valley, Oregon, 1500 - 1999.

Abstract approved: ___________________________

Steven Radosevich

This thesis examines forest history of a portion of the Douglas-fir Region: Soap Creek Valley, a 15,000 acre sub-basin of the Luckiamute River in northern Benton County, Oregon. The primary reasons for the research were to test oral history methodology, document sub-basin scale forest cover pattern changes, and determine basic causes of change. Oral history research methods include interdisciplinary scientific and gray literature reviews, archival research, consultations with local experts, personal observations, and location and/or creation of relevant interviews and interview transcripts. Key findings of this research are: 1) Soap Creek Valley forest cover patterns reflect local human values at any given point in historical time (as modified by local nonhuman disturbances and wild plant and animal species), and 2) oral histories can be an efficient method for documenting and interpreting forest conditions, particularly for the last century of time.

Major findings concerning Soap Creek Valley include: 1) current forest cover patterns are largely a result of savannah afforestation, agricultural practices, and housing developments since 1845; 2) wildlife biodiversity richness is greater now than in preceding centuries; 3) forest trees occur in even-aged stands and groves generally less than 100 years and rarely over 350 years of age; 4) early historical forest trees existed in isolation, groves, and relatively small stands and pockets; and 5) local people and prevailing cultural values have been primary shapers of forest conditions for the past 500 years, and likely the past 10,000 years as well.

Master of Arts in Interdisciplinary Studies thesis of Bob Zybach presented on March 5, 1999

APPROVED:

Major Professor, representing Forest Science

Committee Member, representing Anthropology

Committee Member, representing Anthropology

Head of the Department of Forest Science

Dean of Graduate School

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below will authorize release of my thesis to any reader upon request.

Bob Zybach, Author

Acknowledgments

This thesis has taken several years and a significant amount of funding to complete; whatever personal success may have been achieved during that time was made possible by the help and contributions of many people and organizations. A number of individuals, businesses, landowners, and institutions have made major contributions of encouragement, financial support, and/or information during the course of this study. Others have provided a key thought, word, loan, or meal at a critical point in time. If the following list looks a bit too long, from my perspective it is far too short, and I apologize to those I have overlooked or failed to properly acknowledge.

First, I would like to thank my committee for working with me and helping to make my education at OSU as pleasant and productive as possible. Steve Radosevich, in particular, took me on as a student and made my graduate studies possible, after entire Departments had previously rejected my applications. Steve encouraged and supported this work, and made it much better with his pointed questions and detailed edits. Court Smith reviewed my early drafts and gave me excellent help in separating the wheat from the chaff; he then helped me to understand the theory behind the practice. David Brauner and Sheila Coakley also offered excellent help and critical review at key points in time. The work of each of these individuals is readily apparent to those of us who have worked on this project the past several years.

Next, in addition to my own family (to whom this work is dedicated), I would like to thank Bill Atkinson, Richard Hermann, Wayne and Betty Jo Giesy, Ralph and Wilma Hull, Royal Jackson, and Benjamin and Elaine Stout for all the help and encouragement they provided me during the past ten years of research, education, and writing. This work would be of far less quality and consequence, particularly to me, if it were not for the help of these individuals.

Private businesses and individuals played a large role in encouraging and funding this work. Important help was given by Juan Medina, Peggy Medina, and Rodney Slattum of Phoenix Reforestation, Inc.; Tom Tvedten and Pamela Zybach of Zybach Timberland Management, Inc.; Dan Leedle, Ernest Oleman, and John Zybach of ZOL Forestry Services, Inc.; and Bob Edmond and Bruce Fraser of NW Maps Co.;

Oregon State University students that were particularly helpful during the course of my studies include Dr. Mack Barrington, Debbie Deagen, Md. Shahid Islam, Janet Meranda, Denise Ponds, Randy Sablan, Harold Sandstrom, Kevin Sherer, Rodney Slattum, Angela Sondenaa, Ken Tlll, Terri Trosper, and George Wisner.

Much of this research was accomplished as a student employee of OSU Research Forests. Students and staff that were particularly helpful include Bill Atkinson, Pamela Beebee, Debbie Deagen, Jeff Garver, Sanliang Gu, Phil Hays, Md. Shahid Islam, Debbie Johnson, Holly Losli, and Marvin Rowley. Other institutions and individual that provided significant help include Judith Juntanen, of the Benton County Historical Museum; Larry Landis, OSU Archives; JoAnne Perry, OSU Map Library; Elizabeth Winroth, Oregon Historical Society map library; James Strassmeier, Oregon Historical Society oral historian; and Joe Mardis, of the Benton County Surveyors Department.

Academic leadership and guidance was provided by John Elliot Allen, Chris Anderson, Bill Atkinson, Dave Brauner, Robert Buckman, Ron Clarke, Henry Hansen, Richard Hermann, Royal Jackson, Norm Johnson, Charles Kay, Barry Lawler, Mike Newton, Court Smith, John Stewart, and Benjamin Stout. Administrative guidance (and understanding) was provided by Jack Higginbotham, Fred Horne, Tom Maresh, Logan Norris, John Ringle, and Carl Stoltenberg.

Business and industrial assistance was provided by Wayne Giesy, Ralph Hull, and Todd Nystrom, of Hull-Oakes Lumber Co.; Kent Kelly, Siuslaw Timber Operators Association; Mike Miller, Associated Oregon Loggers; Jim Peterson, Evergreen Magazine; Barte and Bond Starker, and Gary Blanchard, Starkers Forests, Inc.; and Mark, Gary, and Lisa Trosper, of Trosper Tile, Inc.

Most financial aid was in the form of student loans, wages, grants, gifts, and contracts. Key support was provided by Ralph and Wilma Hull of Monroe, Oregon; Wayne and Betty Jo Giesy of Philomath, Oregon; Bob and Donna Adams of Dallas, Texas; Emilio Vejil, OSU Financial Aid Director; Fred Friedow, OSU Research Forests; and Delphine Jackson and Jenine Sablan of Albany, Oregon..

Major reviews of the data and ideas contained in this study were provided by Bill Atkinson, Mack Barrington, Dennis Becklin, Wayne Giesy, Cynthia Phelps, Benjamin Stout, and Terri Trosper. Other reviews and technical assistance were provided by Bob Edmond, Joey Heimberg, Md. Shahid Islam, Kent Kelly, Jean Mater, Linda Satchwell, Rodney Slattum, and Angela Sondenaa.

Thank you.

Dedication

This thesis is dedicated to Melodie Ann, Aaron Michael. Aaron Tyler, Dylan Thomas, Natalie Kate, Alistar Nova, Sherry Lynn, Aaron Leopard, Cynthia Jo, Paul Kevin, Terri Michele, and Pamela Kay. You have been my cause and inspiration. Thank you for your love and support. Remember Arnold von Winkelreid.

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List of Acronyms and Abbreviations

The following list contains acronyms and abbreviations used in this thesis. Acronyms are series of letters, usually capitalized, that represent a series of words; examples include CCC, ESA, and USDA from the list. Abbreviations are accepted shortened spellings of common words and phrases, usually using lower case letters and followed by a period; examples include misc., etc., and e.g. from the text, and OR and Rng. from the list.

AD	*Anna Domini.* Standard US calendar year.
BP	Before Present Time (in years). Thesis uses 1999 AD.
BT	PLS Bearing Tree. Key reference points for 1852-1914 surveys.
c.	*circa.* Approximate date or year.
CCC	US Civilian Conservation Corps, 1933-1941
DLC	OR Donation Land Claims. Property obtained through 1850 law.
ESA	US Endangered Species Act of 1973
GIS	Geographic Information Systems
GLO	US General Land Office Survey
HBC	Hudson's Bay Company
OAC	OR State Agricultural College (previous name for OSC)
OR	State of Oregon
OSC	OR State College (previous name for OSU)
OSU	OR State University
PLS	US Public Land Survey, beginning in 1852 for OR and Benton Co.
PSU	Portland (OR) State University
Rng.; R.	PLS Range (approximate 6-mile wide east/west strips)
S. (1)	South of the PLS Willamette Meridian
Sec.; S. (2)	PLS Section (approx. one square mile; 640 acres)
Tsp.; T.	PLS Township (1) approx. 6-mile wide north/south strips, or (2) approx. 36-sq. mile intersections of surveyed Rngs. and Tsps.
UO	University of Oregon
US	United States
USDA	US Department of Agriculture
USDI	US Department of the Interior
USGS	US Geological Survey
WW I	World War I
WW II	World War II
W.W.M.; W.	West of the PLS Willamette Meridian

USING ORAL HISTORIES TO DOCUMENT CHANGING FOREST COVER PATTERNS: SOAP CREEK VALLEY, OREGON, 1500-1999

Chapter I. Introduction

"The time has come," the walrus said,
"To talk of many things:
Of shoes—and ships—and sealing wax—
Of cabbages—and kings—
And why the sea is boiling hot—
And whether pigs have wings."
—Lewis Carroll

This thesis poses the question: Can changes in forest cover patterns be reliably documented by systematically questioning first hand observers and other knowledgeable individuals? The principal focus is to demonstrate the utility of oral histories to identify and document types and amounts of change that have occurred in a forested western Oregon environment over time.

OUTLINE AND DESCRIPTION OF THESIS

This section of the Introduction presents principal thesis objectives, provides definitions for primary terms that are used, outlines arrangement and content of thesis chapters, and describes the method by which oral histories, personal communications, and documentary sources of information will be differentiated and referenced in the text.

Objectives

The principal objective of this thesis is to use accepted oral history research methods to determine if measurable change to forest cover patterns has occurred over a representative portion of the Douglas-fir Region during the past

500 years. An additional objective, assuming that such change can be shown, is to identify and document activities, events and processes that caused change within the study area. The primary resource used to achieve these objectives is a series of oral histories assembled by Oregon State University (OSU) College of Forestry, OSU Horner Museum and OSU Research Forests between 1975 and 1999 (see Appendices A and B).

Definitions

Oral histories are tape recorded and transcribed interviews with individuals that document living memory. Oral history research methodology is perceived as either a distinct interdisciplinary science or as a qualitative research approach of particular value to anthropologists, historians, archivists, and/or feminist theorists (see Chapter II). The creation of new oral histories was the principal method used to obtain and interpret primary and secondary source data for this thesis.

The area of study is Soap Creek Valley ("The Valley"), a Benton County sub-basin of the Luckiamute River watershed and tributary to the Willamette River in northwest Oregon. Soap Creek Valley was first explored and documented in October, 1826, the beginning marker of "historical" time (see Chapters II and V and Appendix C) for present-day Benton County. The Valley was "settled" 20 years later, in 1846, by white and black American "pioneers" that had arrived primarily by wagon and horseback via the Oregon Trail. Thus, "prehistoric time" specifically denotes the 10,000 or more years of Soap Creek Valley human use and occupation that preceded documented exploration in 1826, and "presettlement time" is the same 10,000+ years added to the 20 years of "early historical" time that began in 1826 and ended with American settlement after 1845. (Names of pioneer Soap Creek Valley landowners, presettlement Kalapuyans displaced by the pioneers, and landowners for the years 1929 and 1990 are listed in Appendix D.)

Wild Soap Creek Valley plants and animals are referenced by "local" names, primarily because informants favored these terms over published lists of Latin and "common" names. "Local" refers to the names of plant and animal species used commonly by Soap Creek Valley area residents and visitors, rather than the "common" names found in more general lists; e.g., chittum vs. cascara buckthorn, arrowwood vs. oceanspray, boomer vs. mountain beaver, and possum vs. opossum. (Local and scientific names for wild terrestrial vertebrates and wild vascular plants of Soap Creek Valley are listed in Appendix E.)

"Forestland" denotes areas that, in the absence of human intervention, tend to develop canopies of trees. This definition is sometimes called "potential vegetation" (see Chapter IV; Naveh & Lieberman 1993). Virtually all Soap Creek Valley area meets this definition. Native Soap Creek Valley trees, including Douglas-fir, redcedar, grand fir, bigleaf maple, Oregon ash, willow, alder and white oak, are sufficiently large to create a canopy over most existing buildings, roads, and creeks within a few decades; and would likely do so in the absence of human action (Anderson 1993). Pure and mixed stands of these species are capable of growing without human intervention on nearly every drained Soap Creek Valley surface except asphalt, concrete, and open rockface. This description of "potential forestland" varies from common definitions of forestland as (generally large) areas presently covered with trees; from "ecosystem," a bounded area with a "recognizable interdependent structure of organisms and their environment" based definitions of forestland as an "ecosystem dominated by trees" (Hunter, Jr. 1990); and from "ecological" based definitions that describe forestland as "the total assemblage of" trees, their substrate, associated other plants, local animals, microorganisms, soil, and atmospheric climate, including moisture and fire, "that influence the distribution and abundance of all the organisms in the forest" (Kimmins 1987). The principal difference in these definitions is that forestland, as the term is used in this thesis, includes areas that have been cleared of trees for agriculture, timber harvest, building construction, or other reasons. The temporary, or semi-permanent, absence of trees under these circumstances, while possibly limiting an area's consideration as "forest" for a time, does not limit its classification as "forestland." Old beaver ponds, berry patches, and meadows that have afforested during historical time are also included in the definition of "forestland," as are recent clearcuts, local housing developments, and Christmas tree farms.

"Forest cover patterns," for the purposes of this paper, are combinations, numbers, and/or vertical and horizontal shapes of dominant trees, shrubs, forbs, grasses, native and domestic animals, human families, land uses, and physical structures used to describe above ground conditions of forestland at a point in time (Naveh & Lieberman 1993). This definition includes numerical patterns of plant and animal (including human) populations, vertical "structural" patterns of vegetation and human development, and temporal patterns of wildlife introductions and extirpations. This definition varies from more common depictions of forest cover patterns that depend on artificial delineation's of vegetation or animal "habitats," "types," "seral stages," "associations," "communities," "diagnostic species," or similar methods of classification to describe areas of plants and animals that occupy forestland (Kimmins 1987). This latter definition is often limited to mapping and measuring horizontal patterns within a bounded area and both definitions are used interchangeably throughout the thesis. Causes of change to these patterns are identified as "disturbances," "actions," "events," or "processes." (These terms, and others important to this thesis, including "climate," "catastrophic events," and "human activities," will be considered in greater detail in Chapters II, III, and IV).

Arrangement

This thesis is arranged in six chapters, with a list of references and nine appendices. Chapter I is this introduction, which states objectives, defines basic terms, provides an outline of the contents and structure of the thesis, lists principal sources of information, and gives a brief description of Soap Creek Valley. Chapter II describes methods used to gather thesis data, and how the data were organized and analyzed. Chapter III identifies and documents causes of change to Soap Creek Valley forest cover patterns during the past 500 years; Chapter IV is a theoretical construct of forest cover patterns; and Chapter V is a chronological accounting and documentation of specific patterns during that time. Chapter VI summarizes the findings of this thesis, including the utility of oral history research methods for this type and scale of research. Appendices are provided with this thesis and as supplementary documents in the form of monographs (see Appendix A).

Method of Oral History References

The variety of data sources used in this study required a clear and consistent style for citation and reference. In order to distinguish between oral history interviews, personal communications, and printed materials:

1) oral histories and other printed materials are listed alphabetically in the reference section, using a common format, 2) references to oral histories that appear in the body of the text are underlined and identified by interviewee, rather than by author(s), and 3) all personal communications are identified as such in the text and are not listed in the reference section. Table 1 identifies the 17 principal oral history monographs used in this study and lists the method by which each is cited in the body of this thesis. A second column in Table 1 provides a standard citation for locating sources in the reference section.

Table 1. Citation and reference list of oral history informants.

Citation	Reference	Monograph
Berg 1983	Lee and Jackson 1983	No. 1
Cook 1995	Zybach and Sherer 1995	#12
Davies 1997	Jackson and Lee 1997	#13
Dickey 1995	Zybach and Vanderburg 1995	#03
Dunn 1990	Jackson and Lee 1990	#02
Glender 1994	Zybach and Meranda 1994	#09
Grabe 1990	Zybach 1990	#01
Hanish 1994	Zybach and Sherer 1994	#06
Hindes 1996	Zybach 1996a	#14
Murphy 1995	Carlson, Finley, Zybach and Hays 1995	#11
Olson 1994	Zybach and Sondenaa 1994	#07
Rawie 1994	Zybach 1994a	#10
Rohner 1993	Zybach 1993b	#05
Rowley 1996	Jackson, Lee and Zybach 1996	#15
Sekermestrovich 1990	Thomas and Jackson 1990	#04
Starker 1984	Lee and Jackson 1984	No. 3
Vanderburg 1995	Zybach and Wisner 1995	#08

Citation	Method of data source and monograph identification used in thesis body.	
Reference	Formal citation reference, used in thesis reference section.	
Monograph	"#"	Soap Creek Valley Oral History Series monograph number.
	"No."	Horner Museum Oral History monograph number.

NOTE: For example, (Hanish 1994) denotes James Hanish's oral history monograph within the body of the thesis, but is found in the Reference section as: (Zybach & Sherer 1994). A cited interview would be: (Hanish 1994: personal communication).

LOCATION AND DESCRIPTION OF SOAP CREEK VALLEY

This section of the Introduction provides preliminary information and context for better consideration of thesis results (see Chapters III and V). Maps and representative Geographic Information Systems (GIS) layers are provided as a basis for spatial displays and analyses of Soap Creek Valley forest cover patterns that are the principal findings of the thesis.

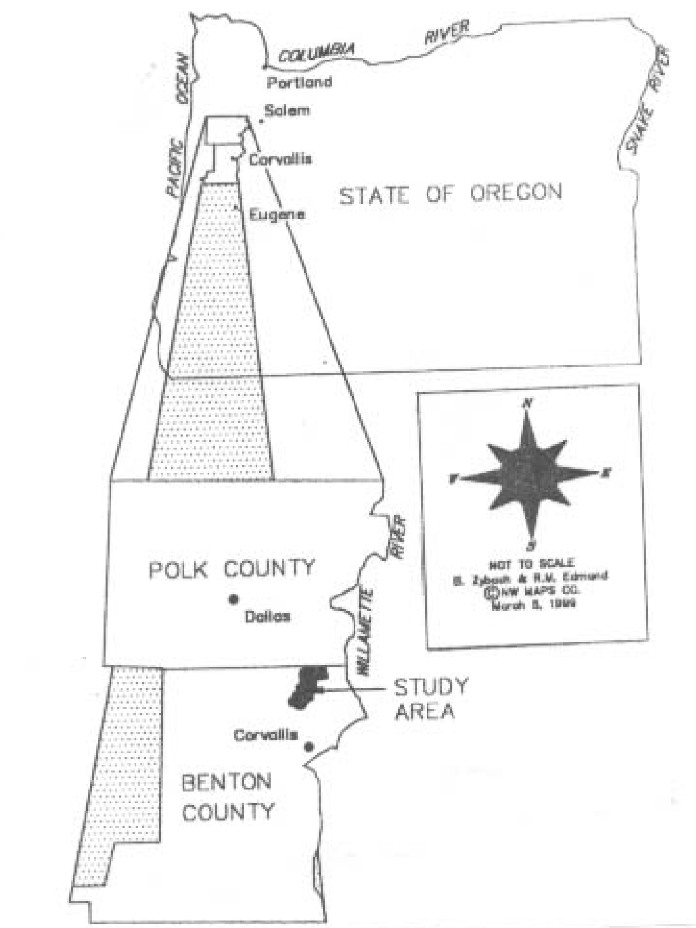
Boundaries and Landmarks

Soap Creek Valley drains an eastern slope of the Oregon Coast Range in northwest Oregon. The Valley is located in northwestern Benton County, along the southern border of Polk County (Map 1). It is approximately 15,000 acres in size and is inhabited by several hundred resident families and dozens of visitors, workers, students, and/or recreationists during most daylight hours. Western, southern, and southeastern boundaries of the study area have been made to conform with public land survey (PLS) lines established between 1845 and 1942 that most closely conform to actual drainage boundaries of Soap Creek. The northeastern boundary is Highway 99 E. and the northern boundary is Robison Road and the Polk County line (see Map 2). The names and locations of local landmarks are listed in Table 2 and correspond to icons and legal descriptions displayed in Map 2. Origins of landmark names vary from the mid-1800s (e.g., Coffin Butte and Forest Peak) to the late 1900s (e.g., McCulloch Peak and Poisonoak Hill). In instances where landmark names or locations change over time (e.g., Forest Peak and Bakers Mountain) or vary slightly from source to source (e.g., Smith Peak and Smith Hill or Writsmans Butte, Writsmans Peak, and Writsman Hill), efforts are made to identify or clarify these differences in the body of the text or in the captions to maps, figures, and tables.

Legal Descriptions and Land Ownership

The majority of Soap Creek Valley is contained in Township (Tsp.) 10 S. (South of the Willamette Meridian), Range (Rng.) 5 W. (West of the Willamette Meridian). Its eastern boundary is in Tsp. 10 S., Rng. 4 W. and its southern headwaters are in Tsp. 11 S., Rng. 5 W. (see Map 2 and Table 2). County boundaries, Township, Range, Sectional (square mile), and land ownership subdivisions shown on Map 2 were established during early settlement time in Soap Creek Valley (Freeman 1852; Hyde 1852a; Hyde 1852b; Ives 1852; Elder 1853; Hathorn 1854a; Hathorn 1854b; Mercer 1882). Most Soap Creek Valley acreage is commercial-grade forestland, with significant portions dedicated to agriculture, solid waste landfill, lawns, and housing. The Valley contains both government and privately owned forest and farm lands, including significant portions of OSU College of Forestry and College of Agricultural Sciences properties. Most residents live on tax lots less than 10 acres in size (See Map 3 and Table D.4) and commute to work or school outside The Valley's boundaries (Grabe 1990).

Map 1. Location of Soap Creek Valley study area in Oregon, 1999.



Map 2. Named landmarks and original 1846-1882 land surveys. Table 2 provides additional names and legal descriptions of locations identified on this map. Circled numbers depict the names of pioneer landowners (see Table D.2) whose properties were surveyed prior to 1860. Landowner boundaries are the irregular shapes surveyed between 1846 and 1855 that contrast with square-shaped sectional subdivisions surveyed during the 1852-1882 time period.

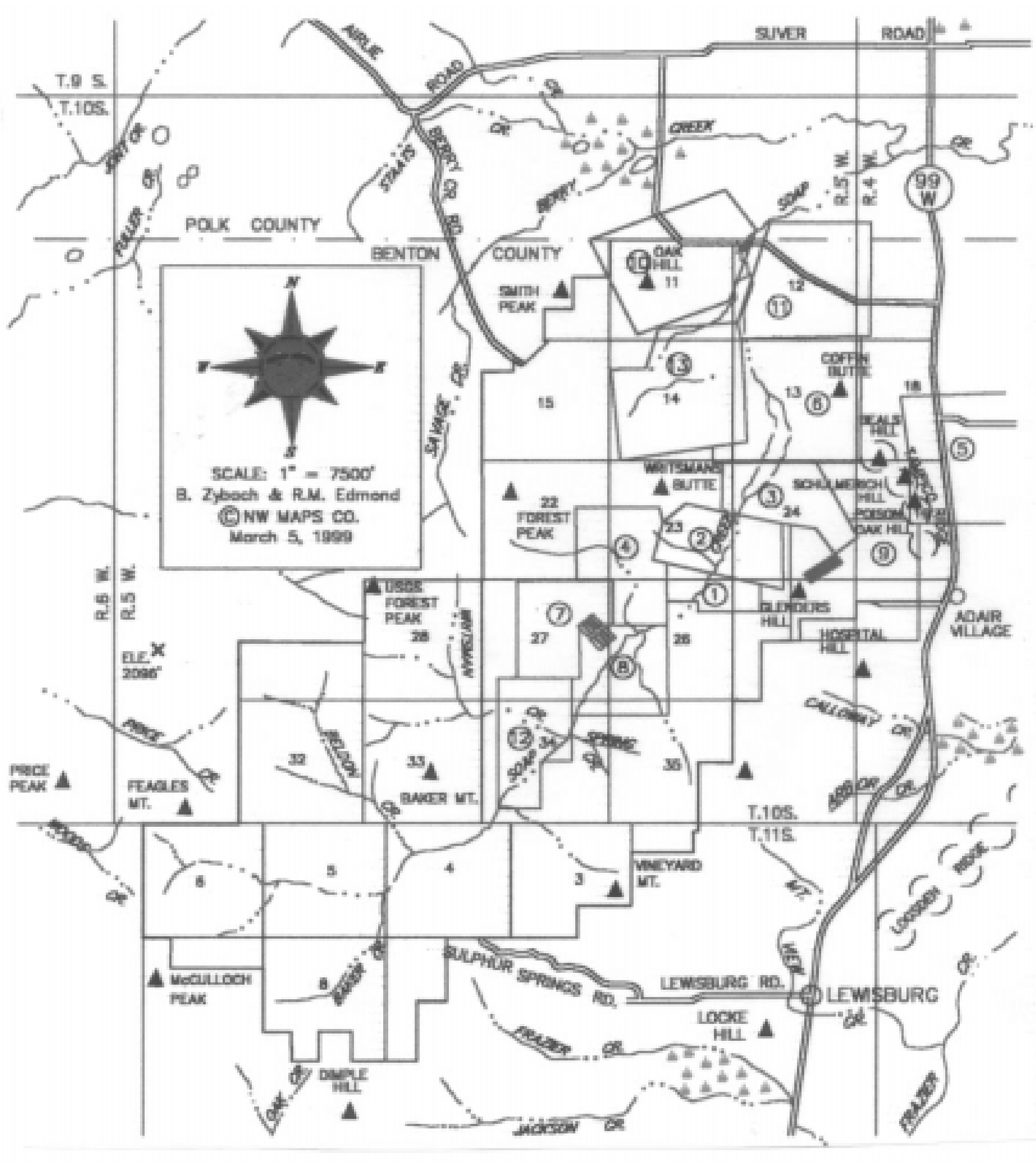
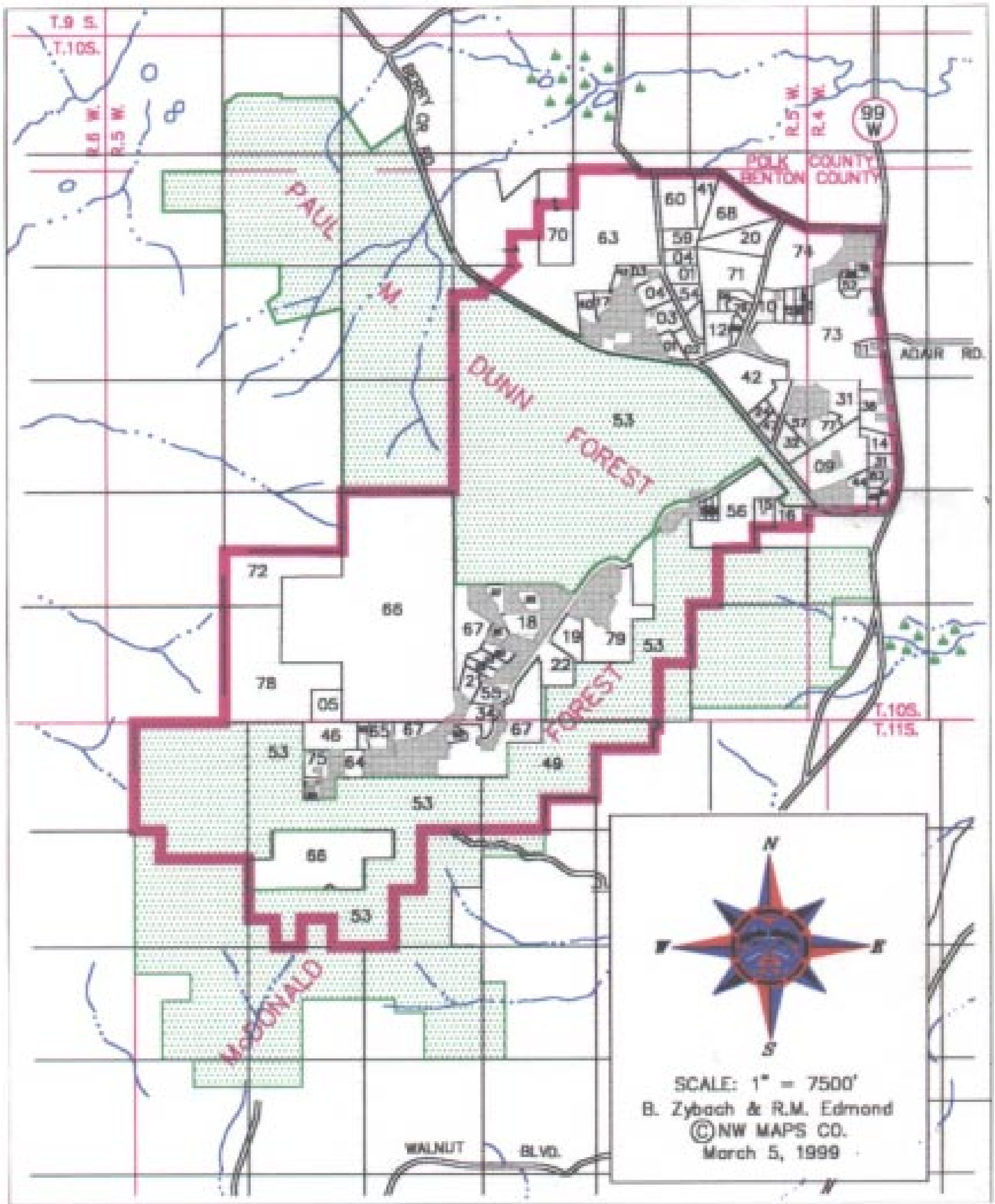


Table 2. Landmark names and locations, 1845-1999. See Map 2 for graphic display of legal descriptions and spatial distribution of named landmarks.

T - R - S	Landmark Name
Tsp. 10 S., Rng. 4 W.: NE Soap Creek Valley, west of Hwy. 99 W.	
10-4-7	Robison Road
10-4-18	Coffin Butte
10-4-19	Tampico Ridge
10-4-30	Hospital Hill
Tsp. 10 S., Rng. 5 W.: majority of Soap Creek Valley area	
10-5-10	Smith Peak
10-5-11	Oak Hill
10-5-12	County Line
10-5-13	Coffin Butte
10-5-14	Rifle Range
10-5-15	Tampico Road
10-5-22	Forest Peak
10-5-23	Writsman Hill
10-5-24	Tampico Road
10-5-25	Glenders Hill
10-5-26	Soap Creek Road
10-5-27	Research Ponds
10-5-28	Writsman Creek
10-5-29	Kings Valley Ridge
10-5-32	Beldon Creek
10-5-33	Bakers Mountain
10-5-34	Soap Creek Schoolhouse
10-5-35	Nettleton Road
Tsp. 11 S., Rng. 5 W.: Soap Creek Valley southern headwaters	
11-5-2	Radio Hill
11-5-3	Vineyard Mountain
11-5-4	Lewisburg Saddle
11-5-5	Sulphur Springs
11-5-6	Cedar Grove
11-5-7	McCulloch Peak
11-5-8	Bakers Creek
11-5-9	Patterson Road

T - R - S: PLS Township S., Range WWM, Section No.
Landmark: 1999 names and descriptions. See Maps 2 and 3.

Map 3. Soap Creek Valley and OSU land ownership patterns, 1990. This map shows OSU Research Forests in relation to Soap Creek Valley. Including agricultural lands, OSU is the largest landowner in The Valley. Numbers on the map correspond to landowners listed in Table D.4. Soap Creek Valley boundaries are outlined in dark red and homesite subdivisions less than 10 acres in size are shown with a gray dot pattern. Note locations of modern homesite subdivisions in comparison with pioneer claims shown on Map 2.



Geology and Climate

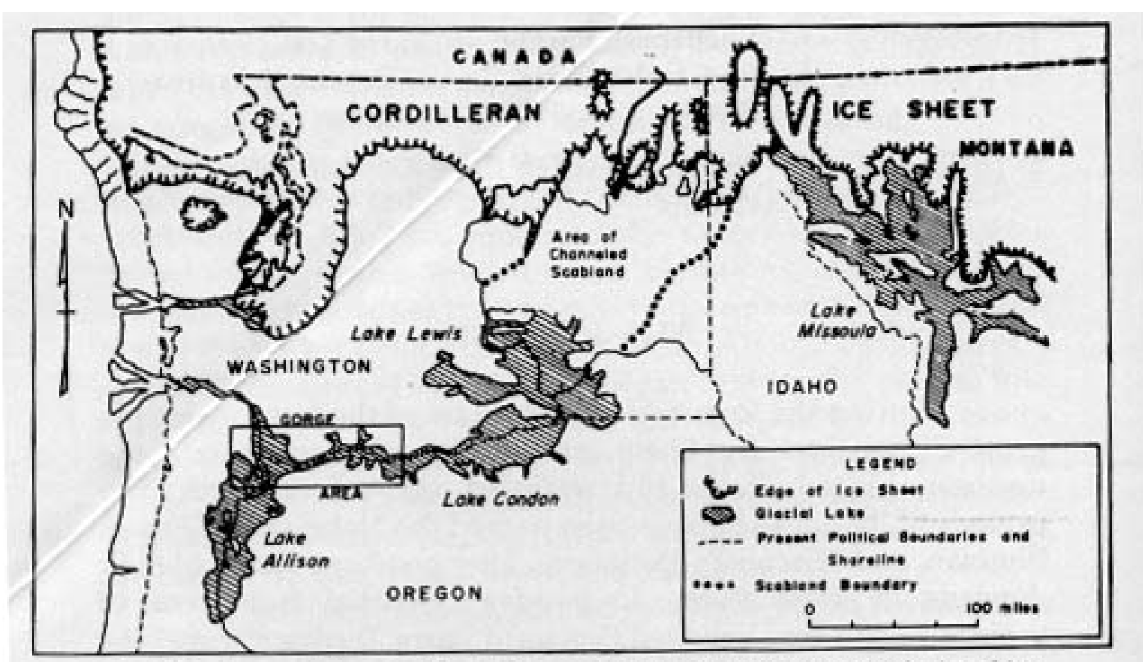
Coffin Butte is considered the easternmost boundary of the Oregon Coast Range within the Willamette River basin. This definition is the result of ancient Siletz pillow lavas that sharply profile the butte and western hills, ridges, and peaks of Soap Creek Valley above the Willamette's floodplain (Allison 1953). These basaltic hills and ridges are the easternmost result of undersea volcanic eruptions that occurred 40 to 55 million years ago (Orr, Orr, & Baldwin 1992). Subsequent volcanic eruptions have not been a direct factor in the development of Soap Creek Valley geomorphology or of forest cover patterns during historical times. For example, eruptions of Mt. Hood (Zybach 1996b) and Mt. St. Helens (Koenninger 1980) to the northeast of Soap Creek Valley during the past 250 years have had little apparent local effect. Some exceptions to this observation might be the secondary effects resulting from changed weather patterns caused by distant volcanic events (Bradley & Jones 1995), or the influences of volcanic ash on foliage or soil productivity (Franklin & Dyrness c.1988).

Kings Valley Ridge (Hanish 1994), to the immediate west of Soap Creek Valley and forming much of its western boundary, is a north-south ridgeline that rises nearly 2000 feet above Soap Creek and separates it from Kings Valley to the west. Continuing further west, across the Luckiamute River on Kings Valley floor, is another north-south ridge of Oregon Coast Range mountains. This second ridge is also higher than 2000 feet elevation and separates Kings Valley from the westerly drainages of the Yaquina and Siletz Rivers, which flow directly into the Pacific Ocean. The effect of the parallel ridgelines, both perpendicular to westerly Pacific Ocean winter storms that provide most moisture to Soap Creek Valley vegetation (Knezevich 1975), is to form a "double rainshadow" (Shumway 1981). Such effect is atypical for Oregon Coast Range valleys and helps explain why plants that prefer drier western Oregon climates, including oak, madrone and poisonoak, are common in Soap Creek Valley. And, conversely, why native Oregon Coast Range trees requiring substantial moisture, including western hemlock, redcedar, Sitka spruce, and black cottonwood, are absent or uncommon in The Valley.

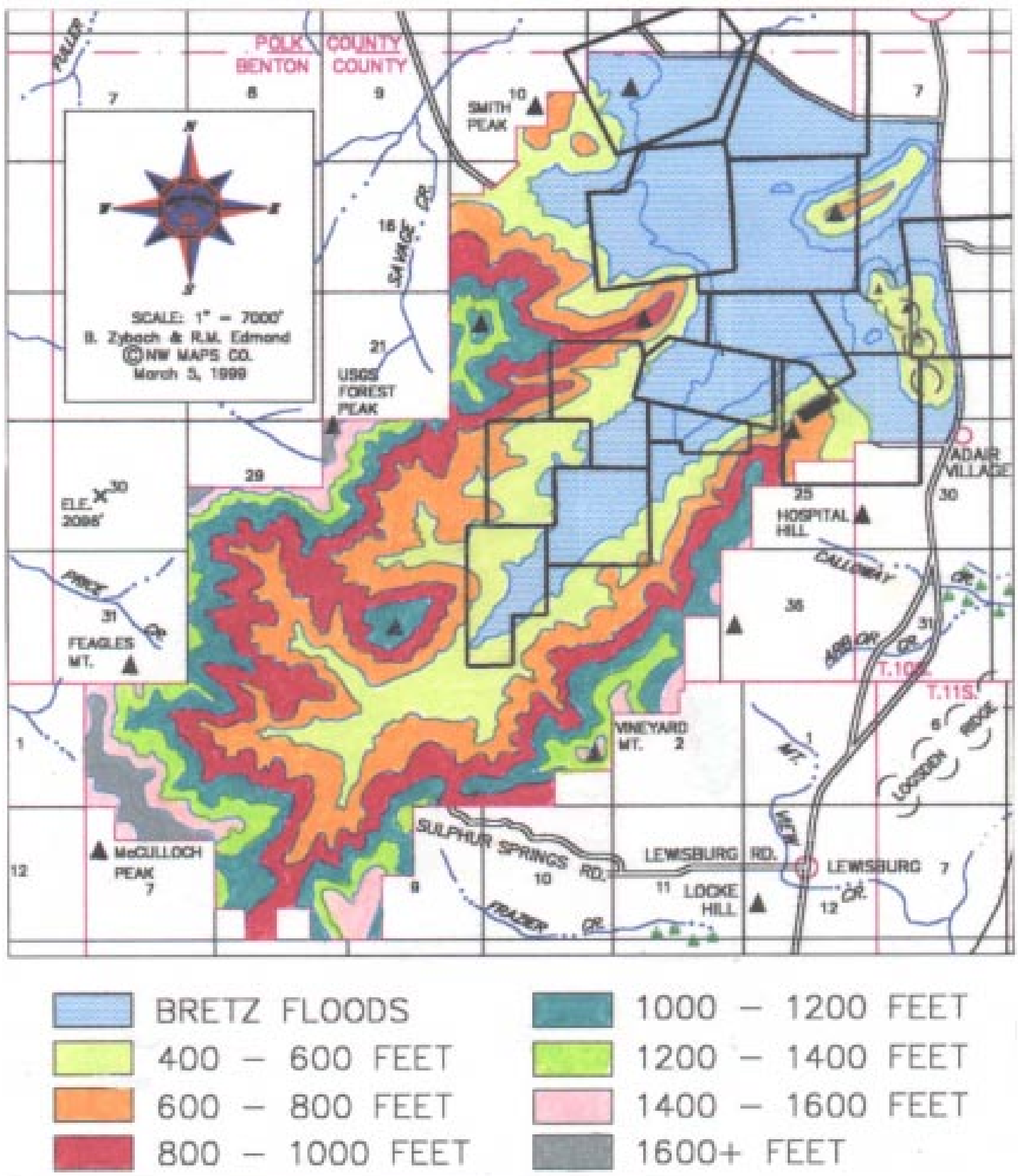
Topography and Aspects

Between 15,000 and 12,800 years ago, approximately 100 catastrophic floods coursed down the Columbia River and filled the Willamette Valley with ice, water, rocks, and soil (Allen 1984; Allen & Burns 1986; see Chapter III). Several, or all, of these events flooded the lower elevations of Soap Creek Valley and created expanses of flat and gently sloping "Willamette silts" (Allison 1953), which is common in much of the Willamette Valley. Map 4 shows the general area and extent of these floods. Map 5 shows the extent of flood soil and rock deposits in Soap Creek Valley relative to surrounding hills and ridges. Map 5 also shows the location of original pioneer land claims (see Map 2 and Table D.2) in relation to flood boundaries. The correlations between flood deposits, early settlement patterns, and current homeowner subdivisions (see Map 3 and Table D.4) form an important part of The Valley's history, as noted and shown in other sections of

Map 4. Extent of ice age floods in the Willamette Valley, 12,800 BP. This map (Allen & Burns 1986) shows the maximum Pacific Northwest extent of the Cordilleran ice sheet between 15,000 and 12,800 years ago. Floods resulting from the periodic draining of Lake Missoula resulted in the creation of several ephemeral lakes downstream, including Lake Allison, the name given to waters that filled the Willamette Valley (see Chapter III).



Map 5. Topography and ice age floods extent, 15,000 BP-1999. Elevations in Soap Creek Valley vary from more than 2000 feet to less than 350 feet above sea level. Area in blue shows land likely covered by “Bretz Flood” events (see Chapter III and Map 4) of 15,000 BP to 12,800 BP (Allen & Burns 1986). Largest floods likely made temporary islands of Coffin Butte and Tampico Ridge (see Map 2). A “bench” 400-600 foot elevation adjacent to the Bretz floodplain may be a partial effect of those events and bears significant prehistoric and early historical evidence of travel route and campsite use (Zybach, Sherer, & Sondenaa 1990). Dark lines indicate pioneer land claim boundaries of the 1840s and early 1850s (see Map 2).



this thesis. Likewise, the general correlation of OSU Research Forests' Paul M. Dunn Forest and McDonald Forest (see Maps 3 and 5) to The Valley's hills, peaks and ridges is also notable. In general, the floodplain has been dominated by residential development and agriculture during historical time, and steep or sloping lands have been used principally for livestock grazing and forestry (see Chapters III and V).

As shown on Map 5, Soap Creek Valley elevations vary from less than 350 feet near its northeastern entrance, to over 2000 feet at the summit of McCulloch Peak (see Map 2 and Table 2). Map 6 shows GIS-generated elevation layers of OSU properties in relation to the study area and Map 7 shows GIS aspect layers for the same properties. Most aspects are southerly or northerly, due to the east-west orientation of The Valley. As described by Anderson (1993), mapped OSU lands tend to resemble "a lopsided wing, the apex pointing east, a ridge line of hills and small peaks defining the V."

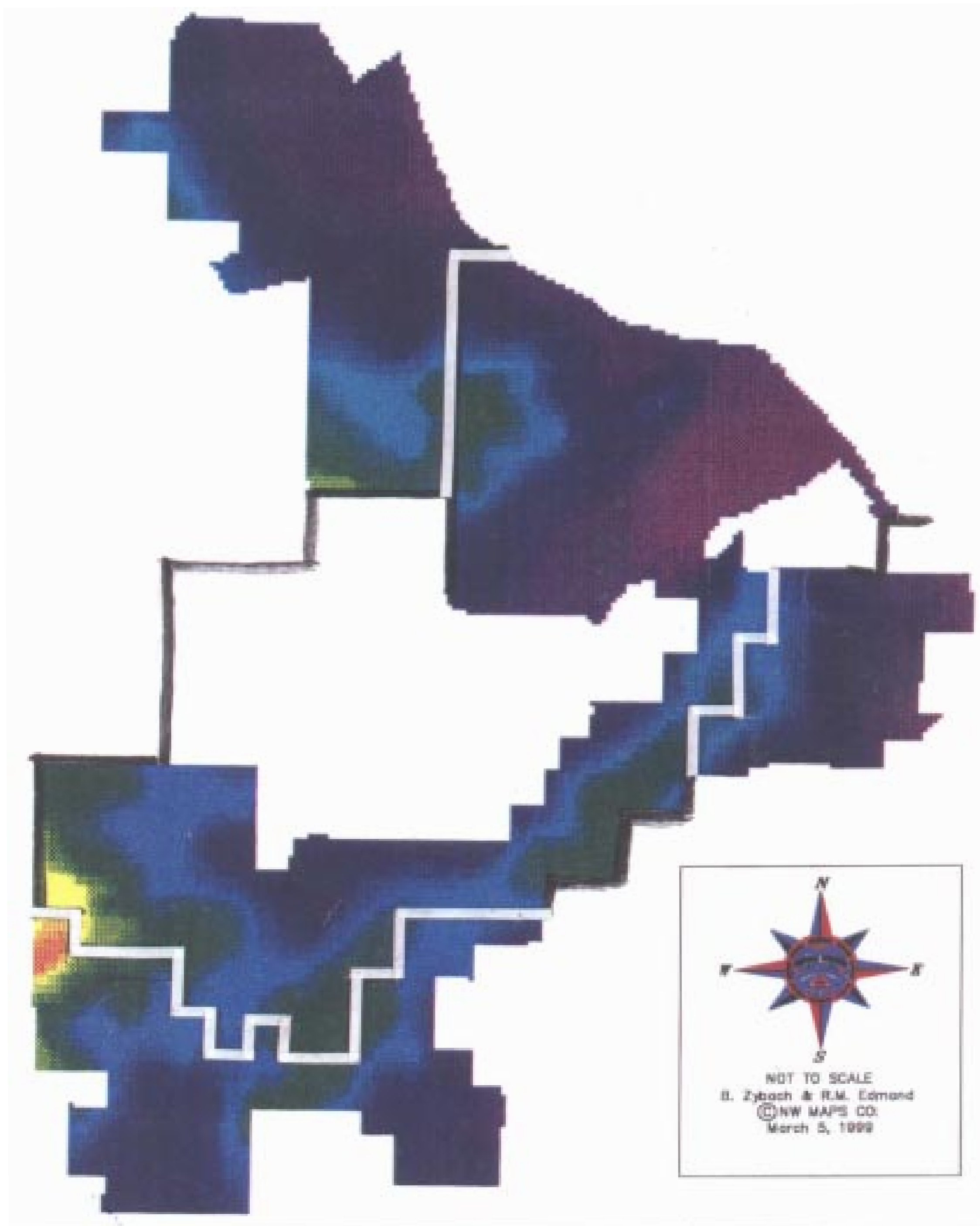
Destination of Surface Waters

Soap Creek enters the Luckiamute River from the south, several miles northeast of its Soap Creek Valley origin, near the Luckiamute's juncture with the Willamette River. The Willamette is the largest tributary to the Columbia River and enters it northwest of Portland, Oregon, about 90 river miles from its mouth on the Pacific Ocean (see Map 8).

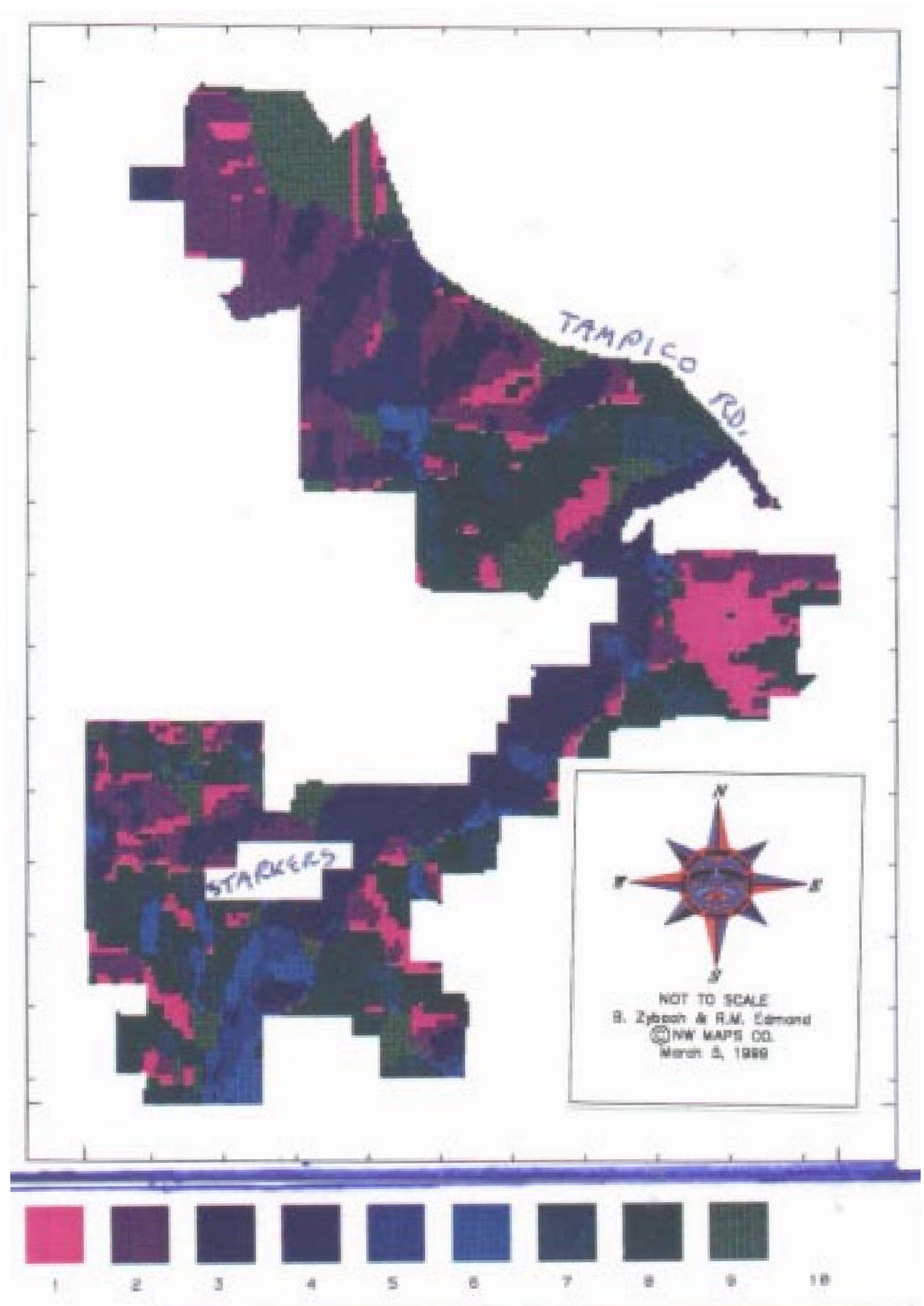
Threatened and Endangered Species

Soap Creek Valley is considered to be within the present range of a number of "threatened" or "endangered" species, as defined by the federal Endangered Species Act (ESA) of 1973 (Hogan 1998). Protected species include spotted owls (Gabrielson & Jewett 1940; FEMAT 1993; Rowley 1996), marbled murrelets (Nelson 1991; Gilligan, Smith, Rogers, & Contreras 1994), Fender's Blue Butterfly (Oregon Natural Heritage Data Base 1987; Zybach et al., 1990), Oregon chub (Altman, Henson, & Waite 1997; Mattson, Runyon, Fernald, Gallagher, Johnson, Snyder, Eden, & Zybach 1999), coho, steelhead, and chinook (Brinckman 1999);

Map 6. OSU Research Forests' GIS topographical layers. OSU Research Forests created a number of computerized GIS layers to provide opportunities for performing sophisticated analyses of forest cover patterns on OSU lands (Zybach et al., 1990; Johnson 1991: personal communication). This map is constructed from GIS-formatted elevational data. Compare these gradient measures of OSU Research Forests and College of Agricultural Sciences lands with Map 3 ownership patterns and Map 5 elevational polygons.

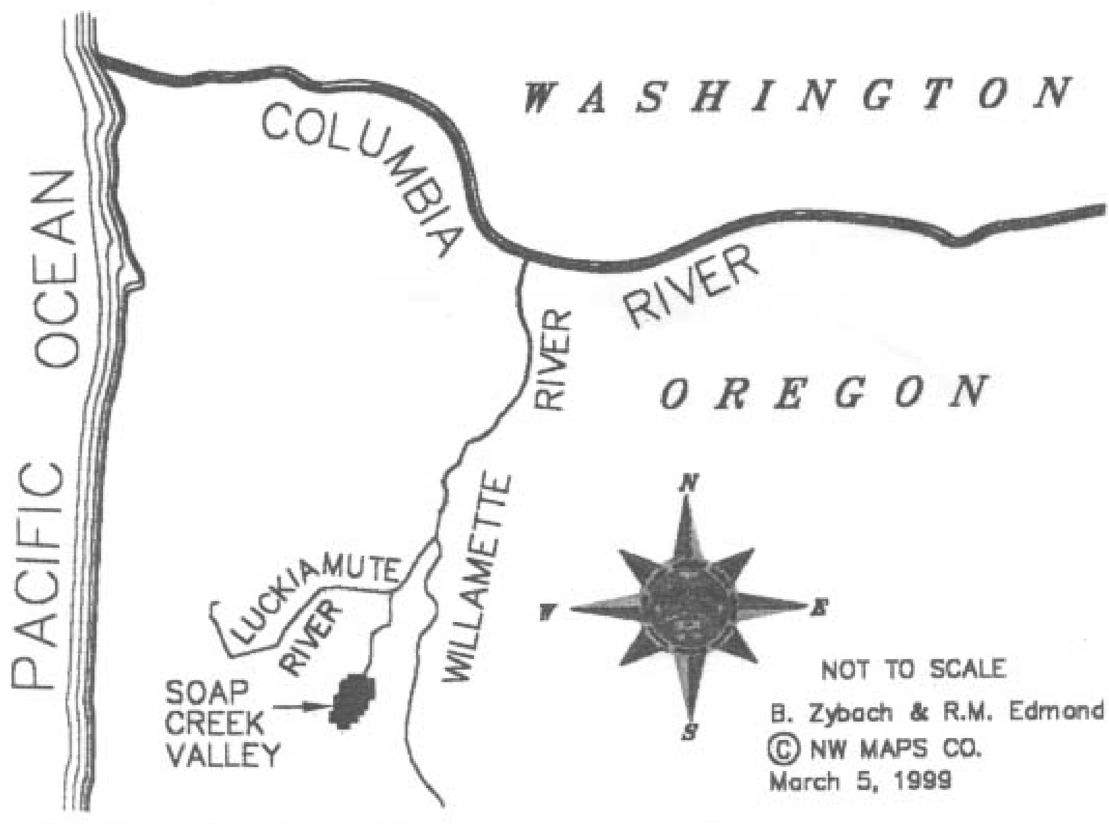


Map 7. OSU Research Forests' GIS aspect layers. The southwest to northeast orientation of Soap Creek Valley (Anderson 1993; Map 2), combined with significant silt deposits from Bretz Flood events (Maps 4 and 5) and current landownership/land use patterns (Map 3); creates a predominantly OSU-owned topography dominated by flats of agricultural lands and steep to sloping southern and eastern exposures of forestlands. The use of GIS to correlate elevation (Maps 5 and 6) and aspect to forest cover patterns (Chapters IV and V) provides a powerful and efficient tool for measuring and analyzing environmental change through time.
Map Legend. 1 = East; 2 = NE; 3 = North; 4 = NW; 5 = West; 6 = SW; 7 = South; 8 = SE; 9 = Flat; 10 = other property owners.)



although there is no indication that the latter three species have ever spawned or otherwise existed within its boundaries (Mattson et al., 1999). In late prehistorical and early historical time (1805-1845), Soap Creek Valley was within the range of several other plants and animals listed currently under the ESA, including timber wolves (Carey 1971), grizzly bears (Douglas 1905), western rattlesnakes (Storm 1941), and California condors (Gass 1904). Of additional resource management and political concern are groves of "old-growth" (more than 200-year old) Douglas-fir that exist in Soap Creek Valley (see Appendices F and G; OSU College of Forestry Forest Planning Team 1993). Local efforts to reserve these trees from logging activities have taken place in Soap Creek Valley, often unsuccessfully, for over twenty years (Rowley 1990: personal communication; Anderson 1993; Davies 1996).

Map 8. Destination of Soap Creek Valley surface waters to the ocean.



Chapter II.
Methodology

When the one great scorer comes
To mark against your name
He marks, not that you won or lost,
But how you played the game.
—Grantland Rice

This chapter describes the types of data that were used to create the oral histories that were synthesized for this study (see Appendix A; Table 1), how the oral histories were created, and how results were organized for display and analysis (see Chapters III and V). Detailed information is provided about the selection and profile of oral history subjects and interviewers who participated in the OSU Horner Museum Oral History Project of 1975 to 1989, the OSU College of Forestry Oral History Program of 1979 to 1981, and/or the Soap Creek Valley Oral History Series Project from 1989 until the present (see Appendix B).

TYPES AND USES OF RESEARCH INFORMATION

At least 19 different types of information were used for research purposes during the course of this thesis. Specific sources of information are listed in the reference section and representative findings are described in text and/or displayed as tables, figures, and/or maps in the body of this document. Types of information used in this research included: 1) aerial photographs, 2) archives (including libraries), 3) artifacts, 4) drawings, 5) fossils, 6) journals (including diaries and correspondence), 7) land surveys, 8) living memory (source of oral traditions, oral histories, interviews, and consultations), 9) maps, 10) newspapers, 11) photographs (other than aerial photographs), 12) pollens, 13) popular literature, 14) satellite imagery, 15) scientific literature, 16) timber cruises, 17) tree rings, 18) vegetation patterns, and 19) video (and film).

Information was used in a variety of ways. It provided background detail and historical context for developing interview questions and strategies. Visible landscapes, objects, aerial photos and other sources of information often functioned to trigger additional memories and/or detailed interpretations from informants Reliability and validity of informant's data were tested through "triangulation" of theoretical, disciplinary, source, methodological, and/or types of information perspectives (Berg 1998). Ultimately, data obtained through oral histories were used to create the series of monographs and archived files and objects that are the basis of this study (see Appendices A and B).

Definitions, Uses, and Values of Research Information

This section defines and discusses the use and relative values of each type of information employed in this research. The following paragraphs are organized by type and alphabetized for ease of reference.

1) Aerial photographs are photographs taken from the air typically from airplanes or balloons. Several detailed series of aerial photographs were obtained for Soap Creek Valley (Zybach et al., 1990). These photographs begin in the 1930s and continue at periodic intervals to the present; a period of nearly 65 years time (1936-1999) for which ten or more photographic datasets of the same study area locations have been taken (Zybach 1992a). Continuous series of aerial photographs provided the surest, most reliable, and most detailed form of repeat photography (Progrotskie 1974; Gruell 1980; Skovlin & Thomas 1995) used for this study. Because they were taken at specific points in time and were taken in series at intervals of less than ten years each, aerial photographs were a major value for locating and mapping landscape features and vegetation patterns and as temporal and spatial references for oral history interviews. Many interviewees provided additional information to, and interpretations of, aerial photographs discussed during the interview process (e.g., Hindes 1996).

2) Archival Records used in this study were limited to public and private records and other artifacts maintained for research purposes at libraries and designated archive facilities. Government documents and private collections included student and business reports, census data, property transaction records, photographs, maps, and legal filings, that provided important historical information about Soap Creek Valley and its forests from the early 1840s until the present (e.g., Glender 1994). Other types of archive records are listed and described separately, under more specific headings.

3) Artifacts, for the purposes of this study, were limited to the physical cultural remains of past and current residents and visitors in Soap Creek Valley. Such evidence dates from the cooking fires and stone tools of thousands of years ago (e.g., Hanish 1994) to the homes, telephone poles, and surfaced roads of today. Both prehistoric and historical artifacts served as effective tools for triggering detailed memories and corroborating information obtained from other sources (e.g., Vanderburg 1995).

4) Drawings, with a few notable exceptions, were of limited value for this research, unless one includes hand sketched maps (e.g., Hindes 1996) and other illustrations made during the interview process. Exceptions include the highly detailed landscape drawings in Fagan (1885) that form an important informational bridge between the land surveys of the 1850s (see Map 2) and the existing landscape photos of the 1890s (e.g., Grabe 1990; Glender 1994). A drawing of Coffin Butte in particular (see Chapter III), was instrumental in obtaining the oral histories of Jake and Wilma Rohner (Rohner 1993). Other drawings from this source clearly show the change from open prairie and savannah that characterized presettlement Soap Creek Valley, to the farms, open pastures, young conifer stands, and oak woodlands of the late 1800s.

5) Fossils, for the purposes of this study, are the remnants of prehistoric plants and animals in Soap Creek Valley, excluding the pollens, tree rings, and vegetation patterns discussed in the following paragraphs. The only example of such fossils in the study area were two elephant teeth discovered by the Glender family in 1919 and/or 1926 (see Chapter III). However, the teeth were an important part of this research for a number of reasons. When first discovered, they were widely publicized and became a part of Oregon history (Glender 1994). They provided important insights into past Soap Creek Valley environments and wildlife extinction processes, and strong support to a number of scientific documents generated during the 1930s and 1940s (Allison 1946; Cressman 1946; Hansen 1949). The teeth also helped demonstrate the capability of oral history subjects to add important details and interpretations to existing scientific data and were useful aides for piquing the interest and encouraging the cooperation of several study participants (Glender 1994; Hanish 1994). The larger fossil continues to provide a point of historical interest to Soap Creek Valley visitors and residents to this time (Zybach 1989; Oregon State University 1990).

6) Journals were the first form of historical documentation for Soap Creek Valley (Douglas 1905; Davies 1961) and the primary source of historical data for late presettlement time. Family diaries often formed the basis of important local memoirs (Rawie 1994) and family histories (Smith 1974; Davis & Davis 1978; Grant 1990). Correspondence dating to the 1840s (Rawie 1994) and continuing through the 1930s (Dickey 1995) and 1990s (Vanderburg 1995) often provided excellent information regarding forest conditions (Cook 1995), climate (Dickey 1995), wildlife populations (Dickey 1995), and other topics of interest. Family letters also functioned to verify, through corroboration, details of local forest history, climate, and wildlife populations obtained from other sources (Dunn 1990; Rawie 1994; Dickey 1995).

7) Land Surveys provided valuable information regarding forest cover patterns that preceded living memory (1890s), timber cruises (1910s), and aerial photographs (1930s). Detailed maps and field notes from the 1850s and 1880s recorded specific locations, sizes, and species of trees and understory vegetation on a regular grid that subdivided the landscape into square-mile sections and pioneer land claims (see Appendices F and G; Maps 2 and 5). Data regarding crops, structures, roads, and other surface features were also identified, described, and mapped. In addition to providing basic background data for this research, land surveys were also useful for interpreting and corroborating later drawings, photographs, timber cruises, aerial photographs, satellite images, and interviewee memories and assertions (e.g., Olson 1994).

8) Living Memory is the basis for oral histories, oral traditions, formal interviews, focus groups, conversations, and consultations. It is the one type of information that can be derived from dialogue with living experts and other observers (Berg 1998). Living memory is the principal, and foundational, data source used for this study and was a critical element for interpreting, corroborating, and/or locating other sources of data. Living memory was also the most useful type of information for triangulation tests of reliability and/or validity (Hoffman 1996) in that several different individuals could be queried easily at any given point in time regarding particular details, sources of information, or observations. Definitions and uses of living memory for this thesis are discussed more completely later in this chapter.

9) Maps, for the purposes of this study, exclude the detailed land surveys and timber cruises (and their attendant maps) that are considered separately (Zybach et al., 1990; Zybach & Maeder 1996). Cadastral (land ownership) maps from the 1920s (Metsker 1929a; 1929b; 1929c) and 1990s (Benton County Tax Assessor's Office 1990) were used to interpret current, hypothetical, and historical forest cover patterns (see Chapters I, III, IV, and V). They provided good means for directing oral history subjects to designated meeting spots and for helping to document recorded tours of the study area (Rohner 1993; Cook 1995; Vanderburg 1995). Maps also proved an excellent tool for interpreting aerial photographs (Hindes 1996) and indexing oral history monographs (Rohner 1993; Hanish 1994; Cook 1995; Vanderburg 1995). Maps are the primary medium used in this study to display and compare spatial and temporal information.

10) Newspapers were used extensively as a source of background data and to corroborate names, dates, and events discussed by oral history subjects. With the exception of a few magazine articles (e.g., Peterson 1994; 1998), no other news media (other than newspaper) sources were used in this study. Obituaries and news articles dating from the 1840s and 1850s provided excellent historical context; more contemporary articles provided important political and environmental details and included photographs, interviews, and results of modern information-gathering and display technologies. Newspaper articles proved to be a reliable source of data that were used in conjunction with scientific literature and oral history transcripts to verify and strengthen the validity and reliability of informant memories and observations (Hoffman 1996; Berg 1998). Recent news articles also have the value of documenting current public perceptions and sources of information regarding local, regional and national issues of concern, particularly those that might focus, or have a potential impact, on Soap Creek Valley forest cover patterns (e.g., Jones 1993; Loew 1993; Stouder 1995; Hogan 1998; Brinckman 1999).

11) Photographs (excluding aerial photographs), were obtained from a variety of sources and documented all living memory time, from the 1890s to the present. Photographs provided an important primary source of data for this research and they were used in conjunction with tape recordings as the principal method to document the oral history research process (see Chapter III; Dunn 1990; Grabe 1990; Sekermestrovich 1990; Rohner 1993; Glender 1994; Rawie

1994; Murphy 1995; Vanderburg 1995; Rowley 1996). Interviewees often provided highly detailed descriptions and accounts of specific photograph collections, many dating to the 1890s (Glender 1994; Olson 1994) or before (Rawie 1994). Photographs were also important stimuli at key points of nearly all of the oral history interviews conducted for this study and functioned as a valuable tool to interpret and corroborate other sources and types of information. A method described as "repeat photography" (Progrotskie 1974; Gruell 1980; Rogers 1984; Skovlin & Thomas 1995) is demonstrated in several figures in Chapter III. Repeat photography involves taking new landscape photographs from the same locations and perspectives as historical photographs in order to compare differences and document change. A selection of aerial photographs taken of the same location over time is a common use of this methodology.

12) Pollens, fossil remains of vascular plants capable of being preserved and interpreted for tens of thousands of years (Hansen 1947), were of limited use for this study. Such sources were primarily valued for their capability to place forest cover patterns of the past 500 years in context to general patterns since the last ice age (10,000 to 15,000 years). As such, they functioned to bridge the time from the known advent of people in Soap Creek Valley (at least 10,000 years ago) until the beginning time of this study, 500 years ago. The interpretative value of pollens for the period of time of this study was minimal and limited largely to discussions of their seasonal allergenic properties.

13) Popular Literature, with the exception of a few local histories (Fagan 1885; Clarke 1927; Davis & Davis 1978; Smith 1974; Smith 1978; McDonald 1983; Wiese 1990) and topical books (Anderson 1993; Chase 1995), were of limited value for this study. Relatively little information specific to Soap Creek Valley exists in this format, and more precise and reliable information was readily obtained through other sources. Popular literature proved useful to establish historical context (Rawie 1994) and/or to further conversation (Glender 1994; Olson 1994; Vanderburg 1995).

14) Satellite Images were also of limited use for this study. They are less detailed than aerial photographs for interpretation by interviewees and less accurate than land surveys and timber cruises for depicting most forest conditions at a scale useful for comparison with other sources of information.

Additional problems are their relatively recent vintage (no data before the 1970s), their limited availability to the general public, and a general lack of ability on the part of most interviewees to interpret them. The principal use of satellite imagery in this study was the assemblage of basic GIS elevational and aspect layers (see Maps 6 and 7) as a model for future display and analysis.

15) Scientific Information was obtained and used in a number of ways for this research. A comprehensive literature review provided a framework of recognized methods for collecting data through oral histories (Dunaway & Baum 1996) to challenge or corroborate other types of data (Berg 1998); to reliably use these methods (Hoffman 1996); to provide established frameworks for summarizing research findings (Raup 1966; Zybach, Barrington, & Downey 1995; Downey, Rilatos, Sondenaa, and Zybach 1996); and to provide a theoretical basis for considering and interpreting findings (Chamberlin 1965; Giere 1979). Literature reviews also assisted in the interpretation of prehistoric landscapes that predated most oral history documentation (Cressman 1946; Hansen 1947; Sanborn 1947; Allison 1953; Hermann 1976; Orr & Orr 1981; Hermann 1985; Bradley & Jones 1995). Theoretical sources included information regarding the uses and values of oral history research (Dunuway & Baum 1996), interdisciplinary communications (McGraw & Harbison-Briggs 1989), and studies of landscape history (Hansen 1947; Hermann 1976) and forest ecology (Franklin & Hemstrom 1981; Kimmins 1987). Methodology focused on oral history research methods, particularly from historical, postmodernist, and feminist perspectives (Dunaway & Baum 1984; Gilgun 1992; Boss, Doherty, LaRossa, Schumm, & Steinmetz 1993; Schvanaveldt, Pickett, & Young 1993; Ray 1996). In general, review of scientific literature was multidisciplinary in scope, but interdisciplinary in design and application. That is, multiple scientific disciplines were identified and considered for their use to this study, and then combinations of selected sources were synthesized to serve various functions related to project design (theory), process (methodology), and analysis (corroboration and comparison). Each of these approaches can be defined as "triangulation" (Berg 1998), which typically involves the use of two or more theories, methodologies, and/or sources of information for purposes of reliability and validity. The method of multiple working hypotheses (Chamberlin 1965) is used to test current theories of forest evolution (Raup 1966; FEMAT 1993), Oregon forest prehistory (Pyne 1982; Botkin 1996), and symbiotic forest cover relationships (Schvanaveldt

et al., 1993), using accepted "weight of the evidence" approaches (Chamberlin 1965; Botkin, Cummins, Dunne, Regier, Sobel, & Talbot 1993). (Note: Many words used routinely in this thesis often carry significantly different definitions for the separate disciplines that use them. For examples: population, reliability, subject, validity, wildlife, and the word significant, itself. A "test of significance" is substantially different for an historian or a cultural resource specialist (Zybach et al., 1990) than it is for a statistician or social scientist (Boss et al., 1993). Scientific and technical terms will be defined in this study as they are first used, or used in a manner that is clear and interdisciplinary in intent, rather than specific to a particular discipline.)

16) Timber Cruises (as distinct subsets of land surveys and/or maps discussed above) provided excellent data for this study particularly for the years 1915 (Bagley 1915), 1940, 1951, 1956 (Johnson 1996: personal communication) and for the period of time from 1961 to 1990 (Rowley 1990: personal communication). Chapter III and Chapter V contain several examples of tables and maps wholly or partially derived from timber cruises. With the exception of discussions with Rowley (1997), however, they were of limited value for most of the oral history research process. A key use of timber cruises was to interpret and display new findings; a function specific to the focus of this study.

17) Tree Rings provide detailed age, fire history, and vegetational response to climate information and have been used by "dendrochronologists" and other scientists for over 60 years to research forest and climate histories. Tree rings were a useful tool for interpreting forest conditions for prehistoric time in Soap Creek Valley (see Chapter III and Chapter V). Their value for oral history interviews was primarily informational, although they were of some use for purposes of corroboration. A principal use of tree rings may be in the future, as a method for further interpretation of oral history findings or for "ground-truthing" satellite imagery to make it more reliable. The long-term OSU Research Forests' timber inventory initiated by Rowley (Johnson, personal communication: 1991; Garver, personal communication: 1996; Rowley 1996) of trees in Soap Creek Valley (see Map 3) has produced a large amount of tree ring data in the form of systematically gathered and documented "increment bores." Because most trees sampled by this method have been less than 150 years of age, the 500-

year time frame of this study provides useful information for interpreting the Research Forests' findings (see Chapter V).

18) Vegetation Patterns form the basis for most descriptions of "forest cover patterns" (see Chapter I). Maps, aerial photographs, and landscape photographs of forested areas are commonly used to depict these types of patterns. Contemporary Soap Creek Valley forest cover patterns were a significant value to this study primarily for the same reasons that aerial photographs and timber cruises were valuable; they provide a common basis for better understanding and depicting forest cover patterns, the primary focus of this study. Documented vegetation patterns, in conjunction with early land surveys, also provided a useful source of information for interpreting late prehistoric and early historical forest cover conditions. Contemporary vegetation patterns were an exceptionally useful topic for a number of participants in this study (Olson 1994; Vanderburg 1995; Hindes 1996; Rowley 1996) and were discussed for their interpretive value for determining past conditions as well as their depiction of current conditions.

19) Videos (and films) were likely the most underutilized and, potentially, one of the most useful types of data associated with this study. No videos or films were located that documented Soap Creek Valley in any manner, much less forest cover patterns. The earliest documentation of this type was purposefully gathered in 1998 to record a 360-degree panorama of The Valley from its floor and a 270-degree panorama from Lewisburg Saddle (Zybach & Fraser 1998). The potential for video to efficiently capture many of the lost nuances of oral history recordings, to document recorded tours of specific locations, and to document changing forest cover conditions remains unrealized.

Primary Research Data

Oral histories are tape recorded and transcribed interviews with individuals that document living memory. Sitton, Mehaffy, and Davis (1983) define oral histories as "recollections and reminiscences of living people about their past." According to Dunaway (1996), oral histories commonly include relevant materials such as tables of contents, indexes, photographs, maps, texts, and other documents to complement interview transcriptions. An oral history, in addition to being a final product of historical research, "differs from other sources of information in that it is also a method; it requires an active collaboration between the historian who collects the information and the narrator" (Schvaneveldt et al., 1993).

The basis for this study is the Soap Creek Valley Oral History Series, a component of the SCV History Project which focused on the recollections of individuals who had lived or worked in The Valley for extended, or during critical, periods of time. Most of these individuals were in their 70s, 80s, or 90s during the completion of their personal history monographs (see Appendix A), and several produced numerous documents and artifacts of value to this study (Islam & Zybach 1999a). The primary and secondary documentation either located (identified, evaluated, and listed) or created through the process of oral history research includes several sources that can be used to contrast, compare, and interpret the history of change to Soap Creek Valley forest cover patterns: oral history monographs (Table 1; Appendix A); maps (see Chapters I, III, IV, and V), photographs (see Chapters II, III, and V), indices (see Table of Contents; References, Appendices); GIS layers (see Maps 2, 3, 5, 6 and 7) computerized databases (see Appendices C, D, E, F, and G; Trosper & Zybach 1996; Islam & Zybach 1999a), artifacts (Zybach et al., 1990; Wisner 1992; Zybach & Phelps 1998; Wisner 1999; Zybach & Wisner 1999), and wildlife checklists (Sondenaa 1991; OSU College of Forestry Forest Planning Team 1993; Comacho & Notting 1997).

Gluck (1996) claims that oral history research "traditionally has been divided into three types: topical, biographical, and autobiographical." This study may constitute a fourth type of oral history—geographical—a type that has good precedence; spanning the very earliest oral history projects. Topical oral histories regard an event, circumstance, or some other thematic focus, as the basis for historiographical documentation. Examples of topical oral histories include studies of the aging process for women (Ray 1996), of the lack of African Americans in resource sciences and US resource management positions (Ponds 1993), and of a sudden decline in local wildlife species (Downey, Rilatos, Sondenaa, & Zybach 1993; Downey et al., 1996). The topic of this study is the documentation of changing forest cover patterns for a specific geographic area (see Map 2) over time (Fig. 4), so it is possible to categorize this paper as a type of topical oral history. Biographical oral histories focus on a single individual from a variety of perspectives. Examples include oral history interviews regarding a well known scientist, business leader, athlete, artist, or politician, collected from family members, friends, and/or business associates. An autobiographical oral history is a comprehensive history of the interviewee, typically made almost entirely from their own perspective. Using this definition, several oral history monographs assembled for this study (see Table 1; Appendix A) can be individually categorized as autobiographical. The Soap Creek Valley Oral History Series, however, is probably best categorized as a "geographical oral history," qualifying as a possible fourth type of oral history. Other oral history studies have also been assembled that focus on environmental (and cultural) change for an area over time. Well known examples of this fourth type of oral history include the story of Coe Ridge (Montell 1996) and Studs Terkel's interviews with citizens of Chicago (Baum 1996). This category can also be used for more localized and lesser-known examples, including a study of northeastern Oregon wildlife (Gildemeister 1992), a rural Benton County (see Map 1) community's 20-year adaptation of the "Foxfire Model" (Alsea High School Students 1989; Baum 1996), and a cultural resources inventory centered in an urban N/NE Portland, Oregon neighborhood (Gardner, Clark, Foster, Horn, Owens, Stroud, & Ward 1992).

Summary. This study is based on a series of oral histories gathered for the purpose of documenting changing forest conditions that have occurred in a sub-basin scale watershed over several centuries' time. Products identified and/or created during the course of this study include a number of printed monographs, maps, pictures, reports, computerized databases, GIS layers, indexes, objects, etc. The synthesis of these materials, to understand better the causes and effects of changing forest cover patterns and conditions, is the principal focus of this study.

BACKGROUND AND DOCUMENTATION OF ORAL HISTORIES

Oral history research can be traced to a synthesis of age old practices of oral traditions, early anthropological and historical research methods, and new technology that occurred in the eastern US in 1948. This section briefly describes the similarities and differences between oral histories and their direct ancestor, oral traditions, the development of oral history research methodology since its technical definition in the late 1940s, and the types and uses of historical documentation that result from the oral history research process.

Oral Traditions and Oral Histories

Oral traditions include accounts of local community and family histories and cultural beliefs that are verbally transmitted among people through stories, songs, games, myths, and other means (Nevins 1996). They have been described as unwritten knowledge passed verbally through successive generations (Vansina 1996). Appendix H provides examples of oral traditions that have been obtained through transcribed interviews and then edited for historical values (Zybach 1999). The two subjects are older, male Kalapuyans (see Fig. 1). Both were born, and had direct ancestors, in the Soap Creek Valley area, and used their native language to answer cultural and historical questions about their own past and the past of their ancestors (Jacobs 1945). Appendix I is an example of an oral tradition that has likely existed only through written history for over 130 years. The Tampico Song was read, sung and otherwise repeated verbatim in Soap Creek Valley in the late 1850s, following the creation of the town of Tampico in 1857 (see Chapter III; Davis & Davis 1978); perhaps it was even written there. After the town was disbanded in 1861 (Zybach 1989; Zybach & Meranda 1989), it is unlikely many people bothered to sing or repeat the Tampico Song; several however, thought it worth preserving, and it has continued to survive in many forms of publications.

Oral histories, in comparison to thousands (perhaps millions) of years of oral traditions, have existed for only 50 years. They are generally recognized as originating in 1948 with Professor Allan Nevin's initiation of the Oral History Project at Columbia University (Dunaway 1996). Nevin combined established interview techniques of anthropologists with a focus on factual (rather than cultural) data, and used recording equipment, rather than written notes, to document interviews. Frisch (1977) contends the primary purpose of American oral history recordings was to document "political and diplomatic history," and the main work of oral historians was "debriefing the Great Men before they [have] passed on." This reflects a common assumption among historians that oral

Fig. 1. William Hartless (Sawala), Champoeg, OR, c.1913. Sawala was born within the current city limits of Corvallis, OR, sometime around 1844. He was likely the "Unknown Heartless" (see Table D.1) of the 1860 census, a possible son of Nancy and George Heartless; all three were Chapanafa (Mary's River) Kalapuyans on the Grande Ronde Reservation rolls of that year (Whitlow 1988). Nancy and George Heartless are each believed to have been about nineteen years old at the time of Sawala's birth; they would have been young children at the time of the early 1830s prairie burning and plagues, but old enough to have remembered them. Sawala's name was changed to William Hartless and he lived long enough (at least until 1914) to witness all but the very last members of his nation to die. This photograph is thought to have been taken in 1913 by Leo Frachtenberg, an anthropologist who interviewed Hartless to obtain oral traditions of the Chapanafa Kalapuyans. Additional biographical details and a translated and edited portion of the interview are included in Appendix H.

history, as an historical tool, was intended to be explicitly archival, informational, and elitist (Frisch 1997).

Technological advancements in the 1950s and 1960s allowed oral historians to conduct oral histories more easily and efficiently than before. The advent and increased availability of portable tape recorders, copying machines, and word processors improved the quality and accuracy ofinformation obtained in oral histories and reduced the amount of time previously needed to record and transcribe formal interviews. Many oral historians soon recognized potential interviewees beyond elitists and expanded life history documentation to include the thoughts, memories, and stories of musicians, educators, black settlers, women, and other social groups (Dunaway 1996). The principal purpose of oral histories, in general, remains the documentation of memories about the recent past.

The terms “oral histories” and “oral traditions” are often used interchangeably, despite their quite different meanings. This division has resulted partly from the differing purposes and intents of each practice, and because of differences in scientific criteria. Oral traditions tend to preserve and communicate cultural information, principally through spoken words, songs, games, and gestures, whereas oral histories explicitly attempt to preserve and communicate historical data via recorded interviews and the written transcriptions of those interviews (see Table 3). The latter, technical, difference are due to historical and scientific requirements that information obtained through primary sources, such as interviews with human subjects, meet sufficient criteria to establish credibility, accuracy, and reliability (Hoffman 1996). Criteria is often established through methods which corroborates the information obtained from the interviewee (primary source) with information derived from alternate or multiple credible sources, such as signed documents, photographs, news reports, and scientific research.

Montell (1996) asserts that the use of oral traditions as having a basis in historical fact “represents an area of open controversy” that has been “severely attacked” by certain scholars “accustomed to more conventional methods of documentation.” He describes a range of four “lines of thought” regarding the historical value and accuracy of documented oral traditions, or “folk history”

(Montell 1996): 1) they are of no value as history, 2) they are of some historical value, but should be used with caution, 3) they function as a mirror of history (history can be viewed through folklore, and folklore as part of history), and 4) they are grounded in historical fact. These lines of reasoning are exemplified by such scholars as: 1) Lowe ("Indian tradition is historically worthless because the occurrences, possibly real, which it retains, are of no historical significance; and because it fails to record, or to record accurately, the most momentous happenings"); 2) Paredes ("Where documents are available for comparison, one may actually trace the process—the reshaping of history to conform with the folk group's own world view, the embellishment of bare historical detail with universal motifs"); 3) Nevins ("in our more recent history the legends of pioneer settlements, mining camps, lumber-men, and the cowboys of the western range, whether in prose or ballad, are by no means devoid of light upon social and cultural history"); and 4) Pendergast and Mieghan, who asserted that "casual comments" made by Paiute Indians of southern Utah "was consistent with archaeological data some 800 years old" (all examples cited in Montell 1996).

Table 3. Basic components of oral histories and oral traditions.

Oral Traditions	Oral Histories
Information is cultural and verbal	Information is historical and documented
Focuses on songs, myths, and stories	Focuses on individuals, facts, and events
Personal and general sources	Eyewitness and 2nd hand accounts
Narrative and explanatory style	Dialogue and interpretive style
May be recorded	Always recorded
May be transcribed	Always transcribed

Finnegan (1996) states that it is important to clarify when information is obtained primarily from legends, myths, songs, etc., because the motivations to create these forms of communication may have "little direct historical relevance: they tend to reflect present realities and preoccupation's rather than those of earlier periods." Vansina (1996), whose work, in common with Finnegan's, is "primarily based on traditions still alive among people without writing," cautions that "oral tradition is not necessarily untrustworthy as a historical source, but, on the contrary, merits a certain amount of credence within certain limits." Finnegan (1996) identifies three "main classes" of oral tradition: 1) recognized literary forms, such as poems, myths, and song lyrics (see Appendices H and I); 2) generalized historical knowledge (see Appendix H); and 3) personal recollections; often the "best source" of historical data available from oral traditions (Finnegan 1996). In order to place Finnegan's and Vansina's observations into context, it is helpful to consider the popular movies, novels, and music of modern industrial nations. Each of these media, or "art forms," is dependent on words to transmit ideas and information, yet few would argue that, in common with oral traditions, "they tend to reflect present realities and preoccupation's rather than those of earlier periods" (Finnegan 1996), and that they are "not necessarily untrustworthy as a historical source, but, on the contrary, merits a certain amount of credence within certain limits" (Vansina 1996). The popular movies, Birth of a Nation (1915) and Gone With the Wind (1939) for example, deal directly with historical details of US history, yet are routinely castigated for their misrepresentations of historical fact and their stereotypical depictions of racial relations. Were these films to be made today, modern writers and directors would undoubtedly present entirely different themes, words, music, and images, even though the times, topics, locations, and events remain the same. Oral traditions, from whom all oral histories, songs, political speeches, games, stories, myths, poems, and secrets have been derived, therefore carry much more meaning and serve far more purposes than simply documenting recent history; oral history strives to do little else.

Documentation of Oral Histories

The documentation of natural and cultural resources information is an integral part of a society's history (Nevins 1996). Berg (1998) contended oral histories provide a distinctive process of historical documentation. Oral histories require that systematically recorded interviews be transcribed in order to be used. The use of recording equipment instead of "taking notes" or other methods of recording formal interviews is advantageous in that relevant verbal nuances and background noises are documented, pauses and repeated phrases necessary to accommodate note taking are reduced, and participant spontaneity and conversational flow are usually improved. For example, the advent of video cameras and players in the 1980s has resulted in additional opportunities for oral historians to capture both event and topic of an oral history interview in a medium that is more detailed and graphic than the tape recorded interviews and photographic snapshots of the early 1950s. As a result of changing technologies, oral histories have come to be described as "a complex form of electronic preservation of dynamic audio-visual documents" (McGraw and Harbison-Briggs 1989).

As described in a previous section of this chapter, oral history documentation is achieved through recording, organizing, and evaluating various informational sources that include language and literature, still and motion pictures, maps, charts, tables, and numerous computerized formats that include databases, GIS layers, text files, and digital images (Berg 1998). These latter types of documents were used to illuminate, corroborate, complement, and/or challenge oral histories assembled for this study. Combined uses of these formats and documents helped specifically to confirm and/or question the validity and reliability of data contained in the oral history transcripts (Hoffman 1996).

Summary. Table 3 summarizes and lists some of the key technical, methodological, and informational similarities and differences between oral traditions and oral histories. In general, oral traditions have proven to be of little value for this research, both because of their general lack of availability (only a few examples could be located) and because the information they contain is of poor historical value. Oral histories are occasionally confused with oral traditions (or "folklore") by some scholars, thereby contributing to a general lack of understanding of the historical value of documentation obtained through oral history research.

CREATION OF THE SOAP CREEK VALLEY ORAL HISTORY SERIES

The research data for this study were obtained principally from the Soap Creek Valley Oral History Series project (see Chapter I; Appendix A; Islam & Zybach 1999a). A primary purpose of the project was to increase understanding of the history, ecology, and culture of the Soap Creek Valley area; an area impacted by OSU land management practices for nearly 70 years (Grabe 1990). The location, creation, and/or publication of recorded oral history interviews with individuals who were/are a part of The Valley's history was of primary importance in completing this study. The Soap Creek Valley oral history interviews were published and distributed as a series of cross-referenced and indexed monographs (Zybach & Islam 1999) for the purposes of providing a resource base for OSU land managers (Islam & Zybach 1999b) and a research model and data source for students, researchers, and educators (see Map 3; Islam & Zybach 1999a).

Selection and Profile of Informants

Two primary objectives were used to guide the location and selection of participants for this study. First, oral history informants were selected on the basis of whether information they possessed was valid and reliable (Hoffman 1996). Second, it was essential that credible and trusting rapport was built between interviewers and interviewees in order to assure that critical data was not withheld or distorted (Dunaway 1996; Gluck 1996; Schvanaveldt et al., 1993). Additional criteria used in the selection process, the methods of contacting potential participants, and a general profile of selected subjects for the Soap Creek Valley Oral History Series are described in the following paragraphs.

<u>Criteria and methods for participant selection</u>. Criterion used for locating existing oral histories of value to this study (see Table 1) also functioned as a basis for determining potential interview subjects. Two criteria were applied to all selections: participants must have had a first-hand knowledge of events in Soap Creek Valley and they must have lived or worked in the area for a significant period of time. Criteria used to establish the total number of oral history interviews for this study and to control the demographic profile of selected individuals included: 1) efforts to insure informants represented: women and men, local occupations, diverse experiences, and a range of ages within the specified time period (Gluck 1996; Lance 1996; Ray 1996); 2) knowledge that the number of oral history interviews conducted were limited by OSU Research Forests financial constraints (Garver 1990: personal communication; OSU College of Forestry Forest Planning Team 1993); and 3) informants must be "credible" (Giere 1979; Hoffman 1996). In order to obtain as much useful data as possible, while adhering to project budgetary constraints, OSU Research Forests Director Atkinson and Soap Creek Valley oral historian Zybach determined that a

minimum of 12 to 18 selected subjects would be interviewed and recorded for publication (see Table 4).

Older participants were given priority and interviewed first whenever possible. This precedence, or bias, was considered worthwhile because the oldest members of potential interviewees held the earliest and most fragile memories of Soap Creek Valley. One result of this approach was an imbalance in information in terms of time periods studied, in that more information regarding pre-World War I (WW I) and pre-World War II (WW II) Soap Creek Valley was obtained for the modern period subsequent to WW II. The decision to deviate from more common practices of affecting equal representation for a study time period is merited, as most of the older Soap Creek Valley Oral History Series informants are now deceased (see Table 4), whereas numerous individuals with post-WW II memories of Soap Creek Valley remain available for interviews at this time. Further, the imbalance is mitigated to some degree by the use of numerous consultants familiar with The Valley's more recent past (see Table 5).

Other factors considered when selecting participants for the new oral history series included: age and health, lucidity, quality (reliability and/or validity) of memories (Hoffman 1996), breadth of knowledge regarding times, places, and themes of research and resource management interest, willingness to cooperate with the interviewer, and availability to participate in the study. Final selection was based on the potential number of interviews to be conducted.

Informants selected for the Soap Creek Valley Oral History Series were identified and/or located in one or more of five ways: literature review, archival research, referral, solicitation, and volunteer; in most instances through a combination of direct referral and third party references. In December 1989, Lorna Grabe (<u>Grabe 1990</u>; see Fig. 2, Tables 1 and 4) became the first person interviewed for the new oral history series. Grabe was a long-time resident of Soap Creek Valley and was selected on the basis of interest in, and knowledge of, Soap Creek Valley history, her long-standing position with the Soap Creek Schoolhouse Foundation (a local historical preservation organization and co-initiator of the Soap Creek Valley History Project), and because of her acquaintances with early-day Soap Creek Valley residents. Grabe's interview resulted in referrals to Wanda Cook (<u>Cook 1995</u>), Gene Glender (<u>Glender 1994</u>;

Fig. 2. Soap Creek Valley Oral History Series participants, 1940-1991 (see Tables 1 and 4).
Top Left. Marvin Rowley (Rowley 1996) stands next to the rootwad of a wind thrown Douglas-fir along the pioneer (and possibly Kalapuyan) ridge line trail dividing Bakers Creek and Oak Creek (see Map 2) during February 23, 1991 tour of Soap Creek Valley. Photograph by author.
Top Right. Bessie Gragg Murphy (Murphy 1995) and friend view catsears and other wildflowers on grounds of Soap Creek Schoolhouse (see Map 2 and Table 2) in April, 1991. Photograph by author.
Bottom Right. Gene Glender (Glender 1994) at family farm, 1940. Note old-growth savannah oak and barn (Zybach et al., 1990; Sardell, Sears, & Watson 1999) in the background (see Map 9). Both remain local landmarks at the intersection of Tampico Road and Soap Creek (formerly Sulphur Springs) Road to this time. Photographer unknown.
Bottom Left. Lorna Grabe (Grabe 1990) stands in front of Soap Creek Schoolhouse in period dress, April, 1991. Photograph by author.

Fig. 2

Table 4. Profile of oral history informants, 1894-1999.

Name	G	Lifetime	Profession	Interview Focus	Ref.
Murphy	F	1894-1991	Botanist	Wildflowers	11
Cook	F	1895-1991	Rancher	Stock ranching	12
Dunn	M	1898-1988	Forester	Land ownership	02
Olson	M	1898-1993	Rancher	Afforestation	07
Davies	M	1908-1985	Forester	Forest management	13
Hanish	M	1910-	Logger	Prehistoric sites	06
Dickey	M	1914-1990	Wildlife	Wildlife populations	03
Rohner, J.	M	1914-	Farmer	Grass seed farming	05
Rawie	F	1916-	Farmer	Pioneer settlement	10
Sekermestrovich	M	1918-	Firefighter	CCC fire fighting	04
Hindes, N.	M	1919-	Logger	Logging	14
Hindes, C.	M	1921-	Sawmiller	Sawmilling	14
Vanderburg	M	1923-	Sawmiller	Sawmilling	08
Glender	M	1923-	Farmer	Hunting and fishing	09
Rohner, W.	F	1925-1998	Farmer	Military occupation	05
Rowley	M	1928-	Forester	Forestry research	15
Grabe	F	c.1935	Farmer	Modern settlement	01
Total 17	(5 F/12 M)	1894-1999			15

G	Gender
Lifetime	Approximate birth and death years for informants.
Profession	Principal subject career of interest to this study.
Ref.	Soap Creek Valley Oral History Series Monograph number (see Tables 1 and A.1; Map 9)

Fig. 2), James Hanish (Hanish 1994), and Charlie Olson (Olson 1994). Direct referrals from Research Forests staff and associates resulted in interviews with Neil Vanderburg (Vanderburg 1995), who recommended Donald Dickey (Dickey 1995), a former Berry Creek resident. Bessie Murphy (Murphy 1995; Fig. 2) was recommended by OSU Research Forests Advisory Council member (OSU College of Forestry Forest Planning Team 1993) Phil Hays, and by OSU College of Forestry graduate student Marlene Finley. Charles and Norman Hindes (Hindes 1996) volunteered as interviewees after learning of the project from friends. Others, including Velma Rawie (Rawie 1994), Jake Rohner, and Willie Rohner (Rohner 1993) were referred by other Soap Creek Valley subjects (see Table 1).

Twenty-two people were ultimately identified and approached to be interviewed for this project; of these, only one declined to participate (Zybach et al., 1990). The high rate of interest and cooperation in this project facilitated strict adherence to the participant selection criteria, resulting in increased reliability and validity of the information that was subsequently obtained

Map 9. Locations of Soap Creek Valley informants, 1898-1999. Circled numbers indicate Soap Creek Valley Oral History Series' subjects by monograph number (see Tables 1 and 4). Icons and family names show relative locations of subject residences most closely associated with Soap Creek Valley history, with the exceptions of Dunn (#2), Davies (#13), and Rowley (#15). The latter three informants are shown near their OSU base of professional operations. Uncircled numbers correspond to 1929 landowner names and types listed in Table D.3. Solid lines surrounding numbers designate 1929 property boundaries.

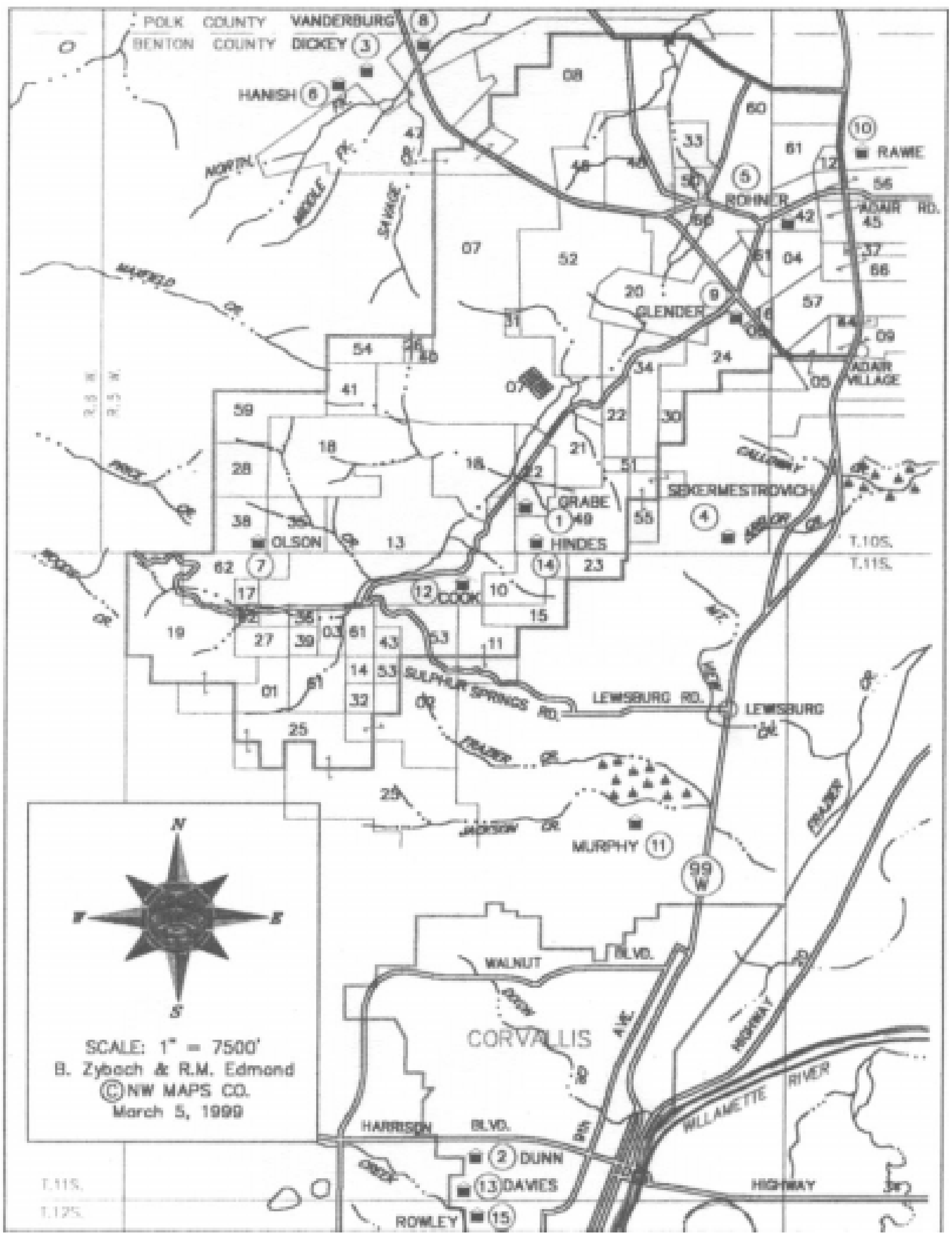


Table 5. Profile of research study consultants, 1984-1999. This table lists the name, gender, professional discipline, organization or university, and time(s) of consultation(s) for individuals cited in this thesis. Note the multiple scientific disciplines and ratio of genders represented by these experts, and compare with Table 4. Of the 34 cited consultants, 22 are male; a partial result of the historical preponderance of males in the forest science and resource management professions.

Name	G	Dates	Affiliation and Discipline
Allen, John E.	M	1989, 1996	PSU Geologist
Allison, Ira S.	M	1988	OSU Geologist
Benner, Patricia	F	1989, 1998	OSU Historical Ecologist
Blanchard, Gary	M	1995	Starker Forests, Inc. Forester
Boyd, Robert	M	1990	Portland, OR Anthropologist
Chambers, Carol	F	1992	OSU Wildlife Biologist
Chambers, Kenton	M	1989	OSU Botanist
Compton, Cecil	M	1991	OSU Horticulturist
Davies, Joan Button	F	1996, 1998	William Davies spouse
Dickey, Maxine	F	1990, 1995	Donald Dickey spouse
Dunn, Neva	F	1990, 1992	Paul M. Dunn spouse
Garver, Jeffrey	M	1990, 1996	OSU Forest Manager
Grabe, Lorna	F	1989, 1996	Soap Creek Schoolhouse Foundation
Gu, Sanliang	M	1991	OSU Horticulturist
Hays, Philip	M	1990, 1993	Corvallis, OR Botanist
Hansen, Henry H.	M	1988	OSU Palynologist
Henderson, Jan A.	M	1993	USDA Forest Ecologist
Jackson, Royal	M	1989, 1997	OSU Forest Historian
Johnson, Debora	F	1991, 1996	OSU Research Forester
Kay, Charles	M	1993, 1996	Utah Wildlife Biologist
Miller, Roger	M	1990, 1995	OSU Farm Manager
Perry, Joanne	F	1989	OSU Map Librarian
Phillips, Jerry	M	1989	ODF Forester
Rowley, Marvin	M	1990, 1998	OSU Forest Manager
Sandstrom, Harold	M	1990, 1998	OSU Forest Historian
Sessions, John	M	1996	OSU Forest Scientist
Silen, Roy R.	M	1989, 1993	USDA Forest Scientist
Smith, Pat	F	1992	Polk County, OR Farmer
Snyder, Sandra L.	F	1990	PSU Archaeologist
Sondenaa, Angela C.	F	1989, 1999	OSU Wildlife Biologist
Taylor, George	M	1999	OSU Climatologist
Trosper, Terri M.	F	1992, 1999	OSU Family Studies
Wakefield, Rex	M	1984, 1989	USDA Forest Supervisor
Webber, Bill	M	1998	Valley Landfills, Inc. General Mgr.
Total 34 (22 M/12 F)			

G	Gender of consultant
Dates	Year(s) of consultation(s)
Affiliation and Discipline	Organization and position at time of consultation

(Hoffman 1996), and added credibility to the methods used to achieve it (Berg 1998; Lance 1996). In addition to the two existing oral histories of value to this project (Berg 1983; Starker 1984), fifteen new oral history monographs have been completed and distributed for the Soap Creek Valley History Series, with emphasis on the targeted 1900-1940 time period (see Appendix A). Pre-existing oral history monographs and transcripts were supplemented through interviews with original interviewees and/or interviewees' spouses (Sekermestrovich 1990; Dunn 1990: personal communication; Dickey 1995: personal communication; Murphy 1995; Davies 1997: personal communication; Rowley 1997). In all, nineteen oral history monographs were used for this thesis (Table 1; Appendix A), including two published (Berg 1983; Starker 1984) and several unpublished (Dunn 1990; Sekermestrovich 1990; Murphy 1995; Rowley 1996; Davies 1997) 1975-1980 OSU College of Forestry/Horner Museum interviews obtained through archival research (Table 1; Appendix B), three oral histories involving more than one interviewee (Rohner 1993; Cook 1995; Hindes 1996), and two monographs that serve as a general methodology (Islam & Zybach 1999a) and index (Zybach & Islam 1999) for the entire Soap Creek Valley Oral History Series.

Profiles of Selected Informants. Table 4 provides demographic profiles of selected interviewees, including their date of birth and (when relevant) date of death, their principal occupation or field of expertise, and a general thematic focus of individual interviews. Map 9 shows the location of informants' current and former residences relative to Soap Creek Valley. This combination of tabular, graphic, and spatial information provides context to better consider individual informant observations, and provides an idea of historical time periods and topical themes examined by the entire series of monographs (see Appendix C). Table 5 lists demographic profiles of individuals who provided information through informal discussions and consultations, rather than oral history interviews. Rowley (see Fig. 2; Table 1; Rowley 1996) is the only individual listed in both Tables 4 and 5.

Development of Data

Efforts were made to maintain consistent interviewers, interview methods, topics, and formats during all recording, transcription, editing, and publication processing phases of informant interviews (Baum 1985; Lance 1996). For example, although Soap Creek Valley oral history recordings were obtained over a 20-year period (1975-1997) with over 20 people (including a few individuals not listed in Tables 1 and 4), only two people, Jackson (1978-1980 OSU College of Forestry recordings) and Zybach (1989-1997 Soap Creek Valley recordings), conducted almost all interviews. Consistent research design and data processing methods further enhanced the quality of interviews (Hoffman 1996; Berg 1998; Islam & Zybach 1999b), as described in the following sections.

Types of recording approaches used. Two approaches to recording oral history interviews were used in this study (Baum 1985). These approaches can be characterized as "historical event" and "historical content," as described in the following paragraphs. Generally, a modified combination of both styles was used to obtain and document most interviews. Efforts were made to accurately and fully document all interviews, yet thoroughly review and edit final transcriptions to insure printed information was accurate as possible, no matter what was initially recorded (Islam & Zybach 1999).

Historical event oral histories focus on "creation of primary source documents" (Baum 1985; Dunaway 1996). They are the result of well documented events in which an oral history interview is the primary occurrence. Historical event approaches to oral history recordings use all forms of available recording technologies, including audio tapes, photographs, handwritten notes, movies, videotapes, etc., to obtain detailed documentation's of oral history interviews. Circumstances, locations, and surroundings of recorded sessions are documented as carefully and completely as possible; verbal nuances and inflections of researchers and informants are recorded and transcribed without alteration. This method provides widely accepted, highly accurate historical documentation of, and context to, what was said, how it was said, and why it was said. The great attention given to detail in historical event oral history interviews adds significant reliability and credibility to information obtained in this manner (Hoffman 1996).

By contrast, the historical content method of producing oral histories may be far less formal. This approach stresses the clarity of ideas and opinions and accuracy of details and observations, rather than the exact wording or circumstances in which they were first described (Baum 1985; Dunaway 1996). For instance, if an informant is recorded as saying their mother was born in 1913, and the date is later determined to be 1915, then the transcript is changed to reflect the more accurate information. A note is then added to the final transcript that such a change has been made. The recording can always be used to determine exactly what was said, and the oral historian can safely quote transcribed text with assurance that historical documentation is given priority over human recollection. Likewise, subjects are given opportunity to amend or edit their words if, upon review, an opinion is deemed to be poorly stated, inaccurate, or unnecessarily harsh or judgmental. This approach provides clarity and accuracy of the recording's content, as opposed to emphasizing the precise details and circumstances of the recording event. It also builds trust between interviewer and interviewee, who can afford to be more candid and forthcoming without fear of appearing foolish or spiteful on final transcripts.

Differences in recording circumstances and objectives existed between archived College of Forestry interviews and the newer Soap Creek Valley interviews, although both tended toward an historical content approach. These differences created somewhat differing profiles and understandings of individual participants. For example, most College of Forestry interviews were conducted in the late 1970s under formal circumstances with two interviewers in Peavy Hall on the OSU campus. By contrast, most Soap Creek Valley interviews were recorded in the early 1990s in subjects' homes and/or Soap Creek Valley locations by a single interviewer. In addition, most College of Forestry interviewees were male OSU College of Forestry students and professors with direct ties to forestry professions, while most Soap Creek Valley interviewees were elderly male and female former residents of The Valley, from a wider variety of professional disciplines (see Table 4). One result of these differences is College of Forestry interviews tend to be more formal and concentrate on scholarly topics and OSU history—including OSU Research Forests and College of Agricultural Sciences lands in Soap Creek Valley—while Soap Creek Valley interviews are more informal and focus more specifically on The Valley's social, wildlife, and landscape histories. Other differences include ages of interviewees and timing of interviews. College of Forestry subjects tended to be much younger when interviewed; either still employed or recently retired, whereas many Soap Creek Valley subjects were purposely selected because they were in their 80s or 90s. Several College of Forestry subjects were unable to consider information subsequent to their interviews (including all of the 1980s and 1990s), particularly when individual deaths preceded the 1989 creation of the Soap Creek Valley History Project (e.g., Dunn 1990; Davies 1997). Some of the best bridges between the two oral history series were provided by individuals who had been recorded in the 1970s and were willing to be interviewed again in the 1990s (Murphy 1995; Rowley 1996). Other methods of bridging the two datasets included consultations with surviving spouses (Dunn 1990: personal communication; Davies 1997: personal communication) and discussions with earlier interviewers (Jackson 1989: personal communication).

Selection of topics. Two primary sets of topics were used in Soap Creek Valley interviews: those generally related to the entire series and those specific to individual informants. In this manner, interviewers were able to gain detailed information and insights as recordings were added to the series and as subsequent interviews and questions became more detailed and specific. For instance, specific occurrences, such as the burning of a local house or the celebration of a particular community event, could be discussed with increasing confidence and detail, or a specific individual could be readily identified by nickname, family surname, or relationship to the interviewee. These types of advantages allowed for more succinct interviews, increased subjects' confidence in interviewer's credibility, and often resulted in more complete and accurate data.

Whenever possible, general topics were included in each interview and/or identified in existing transcripts. They can be categorized as: family history and migration to Soap Creek Valley; family subsistence strategies in Soap Creek Valley; local recreational, academic, and religious training opportunities; informants' impressions and memories of other Soap Creek Valley residents, including names, current addresses and telephone numbers; location and interpretation of historical documents and artifacts related to Soap Creek Valley history; identification and assessments of major events and social changes that affected Soap Creek Valley history; changes in local plant and wildlife populations; and personal perspectives regarding future changes in Soap Creek Valley.

More specific topics were based on the subject's personal experience or expertise. For example, interviews with Sekermestrovich (1990) included questions about US Civilian Conservation Corps (CCC) road construction, tree planting, and fire suppression projects in Soap Creek Valley (Thomas 1980); Dickey (1995) discussed Soap Creek Valley wildlife populations; and Rohner

(1993) interviews contained questions about grass seed production. Sekermestrovich came to Oregon in the 1930s as a CCC "boy" housed in nearby Camp Arboretum (now Peavy Arboretum); Dickey was raised about a mile north of Soap Creek Valley and obtained a degree in Wildlife Science from OSC in the 1930s; and Rohner farmed grass seed row crops in Soap Creek Valley during the 1920s and 1930s. In addition, interviewees sometimes initiated specific topics, such as Olson's (1994) recollections of a local timber ownership dispute or Vanderburg's (1995) memories of the Sulphur Springs trail to Oak Creek.

The recorded discussions of general and specific Soap Creek Valley topics provided an excellent basis for building a detailed account of Soap Creek Valley history, as well as numerous opportunities to compare memories of individual subjects. For example, Olson (1994) and Cook (1995) provide quite different accounts of a pre-WW I structure near Sulphur Springs, and Hanish (1994) and Dickey (1995) offer contradictory recollections of a local population of (believed to be) feral "curly-q" horned sheep.

Interview process. The interview process used strategies that included creation, development, and/or location of needed recording and transcription tools, interview question guidelines, appropriate interview locations, and the actual conducting of interviews (Dunaway 1996; Hoffman 1996). This section describes this process in greater detail and provided context for individual oral histories and for the entire Soap Creek Valley Series.

A number of open-ended questions were used for most Soap Creek Valley interviews. A one page outline of general topics was used as a checklist to track questions during interview sessions. This procedure assured that basic project themes were discussed in detail. Interview topics were also tailored to an informant's knowledge of, and experiences in, the Soap Creek Valley area. In order to facilitate recall, interviews were often conducted at locations in which specific events had transpired; e.g., a house fire in which members of a local family had died (Glender 1994; Vanderburg 1995), or a cattle drive in the late 1930s over a trail used by CCC workers (Vanderburg 1995). Specific artifacts, including maps (Rowley 1994), aerial photographs (Glender 1994), sketches (Rawie 1994), prehistoric tools (Hanish 1994), and even broken glass, old bricks, and nails (Hindes 1996) were used to obtain informant interpretations and stimulate memories regarding specific events, times, and/or places. In most instances, locations, scenes, objects, and other forms of stimulus proved very effective in rekindling memories or triggering additional thoughts (Olson 1994; Cook 1995).

Research assistants were used during the interview process whenever possible. The presence of an additional person made uses of audio recording and photographic equipment easier, created a buffer between the primary interviewer and the subject (often found useful for improving clarity or defusing tension during discussions), and provided additional expertise. In instances where two individuals were being interviewed at the same time (Rohner 1993; Hindes 1996), assistants were not employed due to the potential for added confusion or distraction. Assistants were also not used when it was felt they might make a subject nervous, less candid, or otherwise uncomfortable (Rawie 1994; Cook 1995).

Interviews were conducted at times, locations and under circumstances that were convenient and agreeable to the subjects. This was done partly to build rapport between interviewers and interviewees in order to increase trust, reduce apprehension, and discourage overly-guarded responses. Subjects were informed of their right to stop interviews at any time, to decline answering uncomfortable questions, and to have their own questions answered regarding interviewer's motives, qualifications, and/or interests in the study. Subjects were also informed of the nature of questions to be asked, told their responses would be recorded and transcribed, and that transcriptions would be published and distributed for research and educational purposes. Informants were further assured they would be given the opportunity to edit and amend any transcribed statements they made before their history was distributed (Baum 1985; Lance 1996). The combination of interviewer interest, projected academic and management uses of their work, and personal control over final results produced circumstances in which subjects were uniformly cooperative, candid, and helpful. Another result was that very little recorded information was ever eliminated or significantly altered by any of the subjects.

Recorded interviews typically began with introductions, discussion and signing of an informed consent agreement (see Appendix B), a brief display of recording equipment with explanation of its functions and limitations, and a discussion of the basic interview plan. Recordings were stopped to change tapes, during agreed upon breaks in the interview and/or at specific request of the interviewee. Questions were occasionally repeated or rephrased in an effort to gain additional thoughts or information, but efforts were made to keep repetition to a minimum to avoid irritating the interviewees (see Olson 1994) and to maintain the flow of conversation. Most informants did not mind repeating themselves for “the record” and understood the reasons for doing so. Interviews continued as long as subjects remained willing, with the understanding that follow up interviews and written amendments could be made. Several interviews lasted more than three hours, although most recordings lasted between one and two hours.

Upon completion of recording sessions, informants were told they would receive copies of tapes and transcripts and were encouraged to make whatever edits were desired or needed (Baum 1985). Arrangements for future interview sessions were planned, if deemed necessary. When no additional recordings were warranted, subjects were thanked for their assistance and assured they would be consulted periodically until the actual publication and distribution of their histories.

Transcription and editing of interviews. Tapes of completed interviews were duplicated and originals transcribed. Copies of transcriptions were read and amended while listening to the recordings (“audited”) by people present during the interview (Baum 1985). The interviewees were often the best people for this step because they were most aware of who and what was talked about, general accuracy, how names were spelled, what they had intended to say, and what had been left unsaid. Audited copies were returned to transcribers and necessary corrections and amendments were made to the manuscripts. Unpublished College of Forestry interviews (Dunn 1990; Sekermestrovich 1990; Rowley 1996; Davies 1997) had been transcribed previously from tape recordings to typewritten documents by OSU Horner Museum staff and employees. Many of these transcriptions were incomplete, contained numerous errors, and/or were not in proper sequence, but were used as obtained because the Horner recordings were made unavailable for the first several years of this project. As a result, these transcriptions were edited, but not audited, prior to beginning the Soap Creek Valley recordings. Edits made to the Horner transcripts were transferred directly to computerized word processing software for publication formatting as monographs.

Formatting and distribution of final products. Audited and edited transcripts were prepared for publication and distribution. This process involved creating and/or selecting complementary documents (including maps, illustrations, and appendices), formatting texts and other documents into titled chapters, writing necessary captions and explanatory footnotes, arranging the total manuscript into specific numbered pages, and indexing finished materials with a common (for the entire Soap Creek Valley series) two-tiered system (Islam & Zybach 1999a). Indexes were printed, numbered, and appended as the final pages to finished manuscripts. The resulting monographs were then distributed to subjects' families, selected libraries, Research Forests' staff, archives, and other appropriate individuals and facilities (see Appendix A; Baum 1996).

Documents used to complement transcribed interviews included historical and contemporaneous photographs, new and historical maps, select correspondence, excerpts of published materials, illustrations, drawings, explanatory captions, tables of contents, and introductory statements (Hoffman 1996). Selected materials were arranged as prefaces, appendices, and/or throughout a document, depending on content and purpose of their use. Documents were either specific to an oral history (particularly photographs, tables of contents, and introductory comments), or general to the entire series. Examples of specific documents include photographs of an obsidian biface discovered in Soap Creek Valley by Hanish in the mid-1930s (Hanish 1994) and excerpts from a family scrapbook owned by Rawie dating to the mid-1840s (Rawie 1994). Examples of general documents include prefatory Soap Creek Valley History Project overviews and location maps printed in each oral history, although slight amendments were usually made for each monograph to correct data, improve clarity, and/or acknowledge individual variations in perspectives and themes (e.g., Hindes 1996; Davies 1997). Another example is the 1910 Soap Creek Precinct census data and 1941 Corvallis telephone records appended to the Glender oral history (Glender 1994), a monograph specific to the 1910-1941 time period. These documents corroborate many names, families, spellings, and locations described by Soap Creek Valley subjects other than Glender and form a good reference source for the entire series.

Formatting the 17 Soap Creek Valley oral history monographs included placement and arrangement of chapter breaks and titles throughout final transcriptions, placement and arrangement of complementary documents, selection of common type sizes, fonts, margins, spacing, and background data, and final pagination (Islam & Zybach 1999a). Consistent formatting of oral history manuscripts was required to make indexing processes possible and facilitate data analysis. Specific page numbers and page breaks were determined before indexing was started. Chapter breaks were determined and titled thematically or, for interviews that took place during tours of the Soap Creek Valley area, by specific location. In the latter instances, interview locations were also shown and cross-referenced on detailed maps (Rohner 1993; Glender 1994; Olson 1994; Vanderburg 1995).

Data obtained through earlier published oral histories (Berg 1983; Starker 1984; see Table 1) and transcripts of deceased subjects (Dunn 1990; Davies 1997; see Tables 1, 4 and 5) initially proved of limited value for addressing specific topics of interest. The principal reason for this result is that oral history recordings and transcripts are essentially linear in nature; i.e., information is provided in a narrative format and a reader (or listener) must often "skim" materials or review them in their entirety in order to find specific details of interest. For instance, an individual interested in spotted owl populations might have a difficult time finding: 1) whether they were mentioned at all in a specific document, and/or 2) whether all references were located. The problem is exacerbated if the birds are referenced solely by Latin name (see Appendix E), or by inference ("they," "those owls," "the ESA listing," etc.). In order to address this problem, and to make certain it wasn't compounded when additional monographs and transcripts were added to the series, computerized concordance files of proper and common names, themes, topics, plants, animals, and local landmarks were assembled for the entire Soap Creek Valley History Project (Islam & Zybach 1999a). Names, keywords, and topics were arranged alphabetically in a two-tier system to allow for additional grouping and cross-referencing. The files were then used as the basis for indexing each of the monographs in the series, including previously unpublished transcripts obtained through College of

Forestry interviews. Resulting indexes were printed at the back of each monograph, which permitted consistent "non-linear access" to printed materials throughout the entire series (Baum 1996). The indexes from the first 15 Soap Creek Valley Oral History monograph (see Appendix A) were then assembled into a single document, formatted and paginated as described in preceding paragraphs, and arranged by concordance file into a "master index" for the entire series (Zybach & Islam 1999). For example, references to Paul M. Dunn Forest (see Map 3) are listed separately under "Dunn Forest," "Paul M. Dunn Forest," and grouped under "Oregon State University" "OSU Research Forests," and "College of Forestry" headings (Dunn 1990). All references to the forest were then identified by monograph and page number for the entire series (Zybach & Islam 1999). Three monographs (Rowley 1996; Zybach & Islam 1999; Islam & Zybach 1999a) remain in final draft form and have not been printed or distributed. One monograph (Davies 1997), has been printed, but remains undistributed. References and citations for this thesis refer to the most recent drafts of these documents, all of which are being prepared for transmittal to OSU Archives. It is not known if, or when, this project will be completed and/or extended by OSU Research Forests (Johnson 1996: personal communication), another OSU department, and/or possible off-campus organizations.

In addition to monographs, other research materials were compiled during the Soap Creek Valley oral history process (Baum 1996). In most instances, master copies of monographs were stored at Research Forests offices, original tape recordings were sent to the Oral History Department of the Oregon Historical Society in Portland, Oregon, and original maps, correspondence, photographs, photograph copies, and copies of tape recordings were sent to OSU Archives in Corvallis, Oregon.

DATA ANALYSIS

Soap Creek Valley oral history monographs and supplemental comparative data were organized in a variety of combinations to identify general changes and causes of change in Soap Creek Valley forest cover patterns. Cross-referencing was performed to corroborate and/or determine accuracy of data. Analysis was completed to identify specific effects of historical events, processes, and activities on forest cover patterns.

Organization

Research data were organized within stated spatial and temporal boundaries and by thematic categories. Organization facilitated data analysis and provided acceptable methods for documenting and displaying changes to Soap Creek Valley forest cover patterns.

Spatial displays. Maps, aerial and landscape photographs, drawings, and other figures were used to locate and identify specific areas and/or describe forest cover patterns in Soap Creek Valley. For example, Map 9 illustrates residential locations of oral history subjects in relation to one another and to Soap Creek Valley during the times they were most closely associated with The Valley's history. Thus, Map 9 provides a basis for better interpreting individual descriptions, family photographs, records of local animal populations, logging and farming methods, and changes in plant species locations. Other maps and figures in this thesis provide additional perspectives about patterns of change over time, water drainage, forest cover conditions, land ownership, and human development.

Thematic categories. The use of structured questions, keywords, chapter breaks, and indexes facilitated development and identification of themes during the research process (Berg 1998; Islam & Zybach 1999a). Interviewees' narratives of family history, local subsistence strategies, and changing wildlife populations were leisurely (but thoroughly) discussed during the course of recorded discussions, and then systematically referenced and considered after transcriptions had been indexed and printed as monographs. The first 15 monographs in the Soap Creek Valley series are oral histories (see Appendix A; Table 1). "Monograph #16" (Zybach & Islam 1999) functions as a "master index" to the 15 oral histories. Monograph #16 includes an updated two-tiered index constructed from the same concordance files as the oral histories, permitting systematic search, location and consideration of individuals, topics and themes for the entire Soap Creek Valley series. Appendix C lists six primary historical themes derived from this process: land ownership, land use, local politics, structural development, transportation systems, and wildlife populations. A more detailed explanation of how systematization of data and subsequent identification of primary thematic categories for the Soap Creek Valley Oral History Series was accomplished is described by Islam & Zybach (1999a).

Temporal markers and time periods. Research data was purposefully gathered with references to specific dates, particular years and seasons, and to "temporal markers." Temporal markers include: general events such as World War II and the October 12, 1962 Columbus Day Storm; local events specific to Soap Creek Valley, such as the establishment of Tampico in 1857 and the alleged burning of the "Sulphur Springs Hotel" in 1915; and events specific to the interviewee, for instance, an experience in first grade or the birth of a sibling. The consistent use of dated recollections and observations by Soap Creek Valley oral history subjects provided ready means of placing individual observations in temporal relation to one another (see Chapter V). Temporal boundaries shown in Fig. 3 illustrate the relative amount of local history spanned by Soap Creek Valley oral histories. Fig. 4 illustrates relative periods of time documented by individual subjects. By considering the temporal boundaries and type of each subject's observations of Soap Creek Valley history, insight was gained regarding credibility, accuracy, and detail provided by other individuals in the series. Recognition of common themes and temporal markers provided a sound basis for understanding better the broad patterns of The Valley's biological and cultural evolution.

Topical "time periods" for Soap Creek Valley were derived from identified themes and temporal markers. Elapsed time between markers is defined as "periods," as shown in Fig. 3 and listed as tables in Appendix C. The construction of time periods is an analytical device commonly used by historians, geologists, biologists, ecologists and other scientists to organize and consider incremental and cumulative effects of change (Hansen 1967; Berg 1998). For example, dramatic changes in Soap Creek Valley domestic animal and wildlife populations during the WW II time period (1941-1945) are nearly impossible to demonstrate on basis of individual events, seasons, or years within that period (Gleick 1987). Yet, combinations of livestock removal, fence and barn destruction, and cessation of most sporthunting, fishing, and fur trapping activities during those five years

Fig. 3. Timeline of Willamette Valley forest history, 15,000 BP-1999 AD. This timeline has been used to illustrate recent presentations and formal displays regarding the past 15,000 years of Willamette Valley forest and prairie history, including Soap Creek Valley (Zybach 1992b). Timeline periods and names are based on Allison (1946; 1953), Cressman (1946), Hansen (1947; 1949; 1961; 1967); Aikens (1975; 1993), and Allen (1984). The left hand scale is arranged in increments of 1000 years, with exception of the "Present" (European-American influences) millennium, which is slightly more than 200 years (see Appendix C). Names for earlier millennia were assigned on an interdisciplinary basis (anthropology, archaeology, botany, climatology, forest ecology, geology, paleontology), based on findings of cited sources. The colored right hand scale combines millennia into longer periods, providing additional context for current historical trends; e.g., compare the red "European" period (1788-1999) with the blue "Lake Allison" period (15,000 BP-12,800 BP).

Fig. 4. Timeline of oral history documentation, 1800 - 1999. The five oral histories shown on this graph (see Tables 1 and 4; Fig. 2) represent the documented history of Soap Creek Valley, as developed by participants in the Soap Creek Valley Oral History Series (see Appendices A and C). Total time represented by this figure approximates the red "European" period shown on Fig. 3. Taken together, the two timelines illustrate oral histories as "documentation of the recent past" (Berg 1995). The
"Prehistoric Evidence" bar represents data provided by oral history informants regarding the presettlement period (before 1846) of human occupation in Soap Creek Valley. Such evidence includes obsidian artifacts and fossil plant (e.g., pollen and tree rings) and animal (e.g., bones and hair) materials.
"Historical Documentation" includes early maps, surveys, written accounts, pictures, correspondences, and photographs of the Soap Creek Valley area.
"Eyewitness Account[s]" are transcribed first person recollections that form the basis of most oral histories (see Table 6).
"Informed Interpretation" is the period of time between an informant's last direct involvement in Soap Creek Valley history and their most recent recorded interview or consultation.

Fig. 3

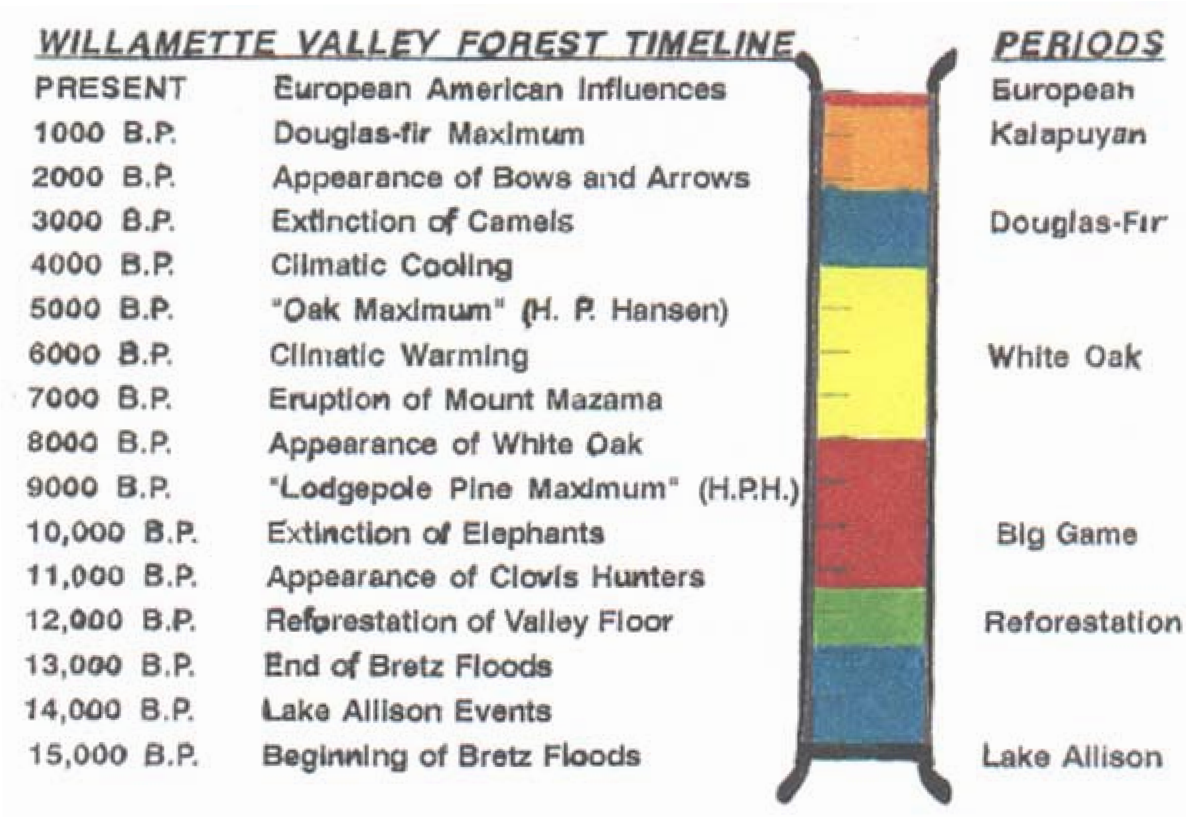
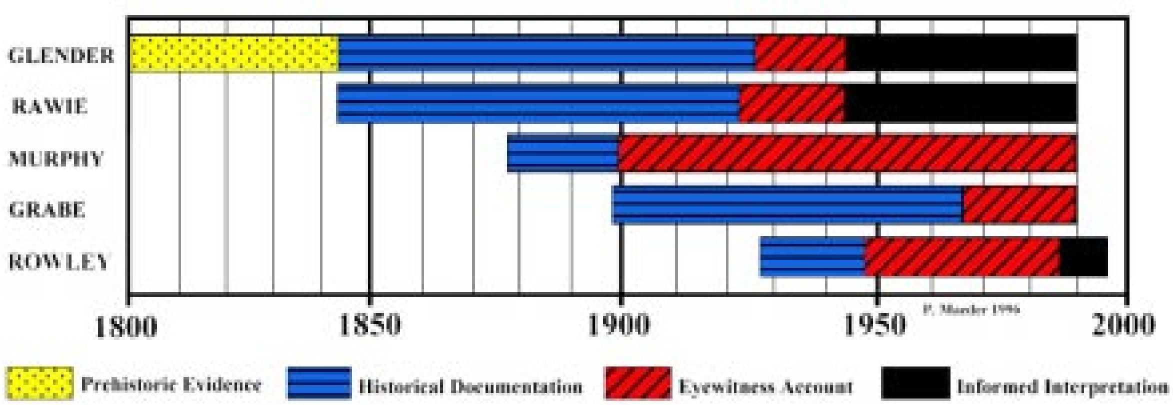

WILLAMETTE VALLEY FOREST TIMELINE
PERIODS
PRESENT European American Influences
1000 B.P. Douglas-fir Maximum
2000 B.P. Appearance of Bows and Arrows
3000 B.P. Extinction of Camels
4000 B.P. Climatic Cooling
5000 B.P. "Oak Maximum" (H. P. Hansen)
6000 B.P. Climatic Warming
7000 B.P. Eruption of Mount Mazama
8000 B.P. Appearance of White Oak
9000 B.P. "Lodgepole Pine Maximum" (H.P.H.)
10,000 B.P. Extinction of Elephants
11,000 B.P. Appearance of Clovis Hunters
12,000 B.P. Reforestation of Valley Floor
13,000 B.P. End of Bretz Floods
14,000 B.P. Lake Allison Events
15,000 B.P. Beginning of Bretz Floods
European
Kalapuyan
Douglas-Fir
White Oak
Big Game
Reforestation
Lake Allison

Fig. 4


GLENDER
RAWIE
MURPHY
GRABE
ROWLEY
1800
1850
1900
1950
2000
Prehistoric Evidence
Historical Documentation
Eyewitness Account
Informed Interpretation

led to profound increases in Soap Creek Valley hawk, owl, deer, bear, and native tree populations (Rohner 1993).

Table 6 summarizes Soap Creek Valley historical themes, the number of thematic markers, and the greatest, shortest, and average lengths of time periods for identified themes, as listed in Appendix C. Note that many markers are identical for a number of different themes, and only categories with potential impact on Soap Creek Valley forest cover patterns are listed. For example, changes in local home construction standards or the history of public education are not considered as they are probably irrelevant to this study. As shown by Table 6, peoples' memories tend to group events and occurrences into similar periods of times, regardless of topic or theme. In general, important markers are all more than 10 years apart in time; resulting periods are all less than a century in length, and average less than 30 years each. Of the 44 periods identified for six thematic histories in Table 6, none are less than 12 years or more than 85 years in length. This remarkable consistency in grouping is likely a partial result of analytical bias by the researcher, but seems, more importantly, a general function of human perceptions of time; i.e., unless something remarkable occurs in the interim, most memories seem to focus on key events that occur about once every generation—on average, about every 30 years, no matter what topic is considered. This finding is particularly interesting when one considers that people rarely give birth at age 12 or less, nor do many individuals live long enough to recall as many as 85 years. On a practical basis, this finding demonstrates that, for older citizens who form the bulk of oral history subjects, a decade is generally too short a period to discuss in detail, and a century is too long. As a general rule then, time periods for histories that span living memory can be reasonably organized and considered on a human lifespan basis of three to six generations per century, regardless of the primary focus of the history.

General Chronology and Value of Data Types

There is a general debate among historians and oral historians about the definition and relative value of "primary source" data (Montell 1996). Many historians have argued that oral histories are simply the recollections of an individual and, as such, constitute a "secondary" form of historical

Table 6. Thematic time periods and historical markers, 1788-1999. Information in this table summarizes data contained in Appendix C.

Historical Theme	Markers	Length of SCV Historical Time Periods		
		(Shortest)	(Longest)	(Average)
Land Ownership	7	12	56	30
Land Use	8	12	69	27
Local Politics	9	12	47	24
Structural Development	8	14	51	27
Transportation	5	20	85	42
Wildlife Management	6	22	68	35
Averages	7	15	63	30

Historical Theme	Thematic categories related to forest cover (see Appendix C)
Markers	Event or occurrence of particular common interest or awareness
Length of SCV (Soap Creek Valley) Historical Time Periods	
(Shortest)	Least number of years between recognized thematic markers
(Longest)	Greatest number of years between recognized thematic markers
(Average)	Average number of years between recognized thematic markers

documentation (Moss 1996). Oral history advocates have argued that oral history transcripts, and the data that are assembled and created during the production of transcripts, are one of the best forms of primary source documentation; at least on par with sworn courtroom testimony, daily diaries, correspondence, and/or written eyewitness news reports favored by historians (Dunaway 1996). The basic research materials of archaeologists, geologists, paleoecologists, palynologists, botanists, and anthropologists may also be considered primary source data, as described at the beginning of this chapter. For the purposes of this thesis, primary sources are both the first-hand account products of oral history research and the principal research materials and artifacts used by other scientific disciplines.

Table 7 lists the principal sources of information used for this study. Sources are arranged by general Soap Creek Valley forest cover pattern time periods (see Table 6) that will be used for the remainder of this thesis (see chapter V). They are assigned an arbitrary “Use” rating by the author regarding their general availability and durability (Poor, Fair, or Good). Arrangement is also based on a source’s actual use for interpreting earliest specific points of time (by year) for this study. Arbitrary numbers are also assigned by the author to represent a source’s relative value for: 1) interpreting and/or documenting Soap Creek Valley forest cover patterns; 2) potential uses for interpreting and/or

Table 7. General time periods and values of information, 1500-1999.

	Type of Information	YRS	USE	AFC/P	AOH/P
			1500-1625: OLD-GROWTH		
1.	fossils	1000+	POOR	1/2	1/1
2.	pollens	1000+	POOR	1/2	1/1
3.	artifacts	1000+	FAIR	1/2	1/2
4.	vegetation patterns	1000+	GOOD	3/3	1/2
5.	tree rings	450-	GOOD	2/3	1/2
			1626-1825: 2ND GROWTH		
			1826-1845: SAVANNAH		
6.	journals	175	FAIR	1/2	1/2
7.	maps	173	GOOD	3/3	3/3
			1846-1883: RANCHING		
8.	newspapers	155	GOOD	1/1	2/2
9.	archives	155	FAIR	2/3	2/3
10.	land surveys	148	GOOD	3/3	1/2
			1884-1914: FARMING		
11.	drawings	115	FAIR	1/2	1/2
12.	popular literature	115	FAIR	1/1	1/1
13.	photographs	105	FAIR	3/3	3/3
14.	living memory	100	FAIR	3/3	3/3
15.	timber cruises	85	FAIR	3/3	1/2
			1915-1940: LOGGING		
16.	scientific research	80	GOOD	3/3	2/2
17.	aerial photographs	64	GOOD	3/3	1/3
			1941-1962: WAR		
			1963-1999: HOUSING		
18.	satellite imagery	26	FAIR	1/2	0/2
19.	video and film	1	POOR	1/3	0/3

YRS Years Before Present (BP) that such documentation is known to exist specific to Soap Creek Valley (e.g., 80 BP = 1999 AD - 80 years = 1919 AD).
USE A relative and arbitrary measure of the stability of information source over time:
POOR = Few sources exist and/or replications and interpretations are scanty,
FAIR = The information source is fairly well preserved, known, and available,
GOOD = The information source is well represented, distributed, and known.
AFC/P Actual Forest Cover pattern value/Potential future value. An arbitrary determination of the information source's actual and potential values for interpreting and/or documenting forest cover patterns at a scale useful for this study:
0= Not Useful, 1 = Occasionally Useful, 2 = Generally Useful, 3 = Very Useful.
AOH/P Actual Oral History usefulness value/Potential future value. An arbitrary determination of the information source's actual and potential values for interpreting and/or documenting oral history research for this study and other studies of this nature and scale:
0= Not Useful, 1 = Occasionally Useful, 2 = Generally Useful, 3 = Very Useful.

documenting forest cover patterns for similar, future studies; 3) interpreting and/or documenting oral histories used for this study; and 4) potential uses for interpreting and/or documenting oral histories for similar future studies. For example, videos and films were used very little during this study to interpret forest cover patterns (AFC = 1 = "Occasionally Useful"), but should be considered strongly for use in similar, future studies (/P = 3 = potentially "Very Useful.") Likewise, photographs were considered "Very Useful" for interpreting and/or documenting Soap Creek Valley oral histories (AOH = 3), and should be seriously considered for use in similar, future studies (/P = 3). Thus, videos were used for only a fraction of their potential value (1/3 for forest cover patterns and 0/3 for oral histories), while photographs were used to their full potential (or nearly so): 3/3 for both forest cover patterns and for oral histories.

Comparative

Data obtained from human subjects is frequently criticized as potentially inaccurate, self-serving, or even fabricated (Boss et al., 1993; Hoffman 1996). Little reliance is often placed on the spoken memories of others, particularly if the informant is a stranger, information is second or third hand, or memories are of times long past (Montell 1996; Moss 1996). These problems were resolved by triangulation of oral history transcripts with other scientific and documentary sources of information (Jones & Bradley 1995; Berg 1996) in order to help assess the credibility (validity and reliability) of Soap Creek Valley subjects (Hoffman 1996) and other sources of information used in this research. In most instances, corroboration demonstrated striking degrees of consistency in detail regarding descriptions and interpretations of forest cover change, no matter the ages, academic achievements, or occupations of the various observers (see Tables 4 and 5).

<u>Scientific corroboration</u>. Soap Creek Valley contains major portions of OSU McDonald and Paul M. Dunn Research Forests and College of Agricultural Sciences properties (see Map 3) and is located only a few miles north of the OSU campus (see Map 9). One result of this ownership and ready access is that substantial research has been performed by OSU students and faculty in Soap Creek Valley for over 80 years (Nettleton 1956; <u>Glender 1994</u>; <u>Davies 1997</u>). A 1992 evaluation of research projects on College of Forestry and College of Agricultural Sciences lands in the Soap Creek Valley area determined that over 70 research

projects were being performed by 150 to 200 OSU faculty and graduate student researchers at that time, and that these numbers represented “only forestry-related departments on campus” (Johnson 1996: personal communication). A result of widespread and ongoing OSU research is the existence of a large body of scientific literature regarding Soap Creek Valley land use history, forest evolution, and wildlife diversity that spans most of this century; a time and location purposely identical, by project design, to that documented by the Soap Creek Valley Oral History Series (<u>Grabe 1990</u>).

Research data regarding Soap Creek Valley are found in scientific journal articles, theses and dissertations, professional reports, student reports, and news releases (see Reference section for examples). An additional form of scientific information was obtained by direct consultations with local resource managers and OSU, University of Oregon (UO), and Portland State University (PSU) students, graduate researchers and professors (see Table 5). Most referenced professionals are conducting, or cooperating with, research in the Soap Creek Valley area at this time, or have participated in such research in the past. The existence of this body of scientific data and expertise allowed for stringent review of many claims and observations made by Soap Creek Valley oral history subjects. In this manner, observations of Soap Creek Valley tree migration and afforestation by Charlie Olson (<u>Olson 1994</u>) were compared with published findings of Hansen (Sprague & Hansen 1946; Hansen 1947), archaeological findings and predictions of Bell (1981) were compared with similar locations and findings of James Hanish (<u>Hanish 1994</u>), and botanical specimen locations and descriptions of Bessie Murphy (<u>Murphy 1995</u>) were compared with recent professional inventories (Hall & Alabeck 1982; Comacho & Notting 1997). Numerous other examples are found throughout this thesis, particularly in regard to historical Soap Creek Valley forest cover pattern descriptions and dynamics.

<u>Discussion</u>. Comparative analysis of scientific literature and opinion with Soap Creek Valley Oral History Series’ methods and findings identified four types of conformance and/or value:

1) oral history research data were credibly gathered and documented using standard qualitative research methods established by a number of disciplines, including anthropological and oral history disciplines;

2) observations of most Soap Creek Valley subjects were consistent with most scientific findings of a similar focus;

3) Soap Creek Valley subjects often provided greater detail, and thus augmented scientific information available through other sources; and

4) new and credible information developed by this research provided a better understanding of the natural and cultural histories of Soap Creek Valley.

Soap Creek Valley oral histories have produced a number of valuable new products and scientific findings for a number of disciplines. New findings included the identification and documentation of at least three important prehistoric sites (Hanish 1994), the first detailed mapping and documentation of a Soap Creek Valley depression-era sawmill camp (Hindes 1996), and comprehensive listings of historical Soap Creek Valley wild plant and animal populations that date to the mid-1500s (Glender 1994; Murphy 1995). New products of scientific value created by this research (in addition to historical and cultural values related to oral history recordings, photographs, transcripts, and indices) include GIS layers, computerized databases and concordance index files, scanned maps and photographs, digital video segments, and digitized texts. The combination of locating significant existing scientific data, creating new documentation, and using computerized tools permitted highly detailed and technically sophisticated analyses of all oral history data gathered during the course of this study.

Historical documentation. A selection of historical documentation, or "documentary data" (Hoffman 1996), was included in each Soap Creek Valley monograph to illustrate, corroborate, or challenge data supplied by informants. Documentary information included aerial and terrestrial photographs (e.g., Cook 1995; Hindes 1996), family scrapbooks (e.g., Rawie 1995), newspaper articles (e.g., Grabe 1990; Davies 1996), correspondence (e.g., Dickey 1995), history books (e.g., Glender 1994), management reports (e.g., Rowley 1996), maps (e.g., Cook 1995), fossils (e.g., Starker 1984; Glender 1994) and prehistoric artifacts (e.g., Hanish 1994). In many instances, informants added important insights and details regarding documents that related to their own experiences, and often provided such documentation themselves. For example, see Rawie (1993), for a previously unknown addendum to family memoirs first published in 1899. This addendum adds important information regarding the 1846-1850 pioneer settlement of the Willamette Valley and the Soap Creek Valley area. Another example is provided by Hindes (1996), in which 60-year old aerial photographs were used to help produce a detailed map of a previously unrecorded 1929 sawmill camp (see Chapter III). Documentary data were typically supplied as appendices to Soap Creek Valley oral history monographs, although they were also included within the body of several monographs to illustrate specific points or topics.

Computerized concordance files. The creation of concordance files (Islam & Zybach 1999a) and a single, computerized "master index" (Zybach & Islam 1999) made it possible to systematically cross-reference general and specific topics common to Soap Creek Valley interviewees, interviews with other local residents and knowledgeable individuals, and with other sources and types of historical documentation (Hoffman 1996). Islam & Zybach (1999a) provide a detailed discussion of how the series' computerized indexing system was developed and used, as briefly summarized earlier in this chapter. Refinement and use of these tools for this study demonstrated a remarkable consistency and corroboration among memories and observations of Soap Creek Valley oral history interviewees. For example, Glender's (1994) and Vanderburg's (1995) accounts of the c.1935 Hildebrandt fire, and Rohner's (1993) and Rawie's (1994) accounts of US Army occupation of Soap Creek Valley at the beginning of WW II. Individual accounts of the 1918 flu epidemic, the 1937 snowstorm, and the afforestation of the southern and eastern aspect Soap Creek Valley grasslands by first oak, and then Douglas-fir (see Chapters III and V), are also notably consistent among informants.

Theoretical Tests

This study used several theoretical perspectives and concepts in its design (Lance 1996; Frisch 1997), field research methods (Boss et al., 1993; Baum 1985), and evaluation of results for credibility (Dunaway 1996; Hoffman 1996). Other theories were used to guide predictions and analysis of: 1) the status of Soap Creek Valley forest cover patterns and conditions in 1500 and in 1825 (Hansen 1947; Jones & Bradley 1995), 2) the causes and extent of prehistoric (pre-1826) human influences on forest cover conditions (Raup 1966; Pyne 1982; Kay 1995),

3) the methods used to test hypothetical reconstructions of “initial [forest cover pattern] conditions” in 1500 and/or 1826 (Giere 1979), and 4) the methods used to identify and measure human and non-human influences on forest cover patterns (see Chapters III and IV; Chamberlin 1965).

Theories used to establish oral history study design, methods, and resulting datasets have been referenced or discussed in earlier sections of this chapter. Theoretical forest cover patterns and other “initial conditions” for this study are discussed in Chapters III, IV, and V. Prehistoric and historical human influences on Soap Creek Valley forest cover patterns are documented in Chapter III, examined from three different theoretical perspectives in Chapter IV, and are summarized chronologically in Chapter V. Tests of theories used to establish initial conditions and degrees of human influences on forest cover patterns, as outlined by Chamberlin (1965) and Giere (1979), are briefly discussed in this section and Chapter IV; test results are summarized in Chapters V and VI.

Initial conditions for this study (see Map 1 for spatial boundary and Table 7 for temporal boundary) are January 1, 1500 for prehistoric time (1500-1826) and October 5, 1826 for historical time (Douglas 1905; Davies 1961). Four hypothetical conditions will be considered for each of these times (Botkin 1996): 1) that people, unusual processes, and events have had little, if any, influence on prehistoric Soap Creek Valley forest cover patterns; 2) that people have had little or no effect, but normal and unusual processes and events have had some measurable influence on The Valley’s forest cover patterns; 3) that prehistoric people have had a minor, but measurable effect on The Valley’s forest cover patterns, in addition to the effects of normal and unusual processes and events, and 4) prehistoric people were a principal determinant of prehistoric and early historical forest cover patterns in Soap Creek Valley, as modified by normal and unusual processes and events. For prehistoric time, initial conditions must always remain hypothetical; for historical time, standard historical research methods are assumed to be sufficient to determine likely answers (Chamberlin 1965; Boss et al., 1993).

Three common theories will be used to address Botkin’s four possible conditions: successional (or climax) forest evolution theory (Franklin and Hemstrom 1981), landscape disturbance (or even-aged) forest evolution theory

(Raup 1966; Stout 1981), and structural-functional (or sustainable) forest evolution theory (Schvanaveldt et al 1996). These theories will be used in isolation to, and in combination with, one another to predict possible forest cover patterns (see Chapter IV) that can be compared with documented findings (see Chapters III and V). Particular attention will be given to the years 1500 (initial condition of prehistoric Soap Creek Valley forest cover patterns for this study), 1826 (initial condition of historical Soap Creek Valley forest cover patterns; extrapolated from 1853 and 1929 patterns), 1853 (historical forest cover patterns determined by land surveys, timber cruises, and landscape drawings and photographs; extrapolated from 1929 and 1945 patterns), 1929 (historical forest cover patterns; interpolated from 1853 and 1945 patterns, living memory, aerial photographs, and computerized mapping methods), and 1945 (historical forest cover patterns determined in the same manner as 1929 patterns, but with newer datasets; see Table 7) to test the three sets of (climax, disturbance, and system) theories (see Chapters IV and V). Finally, the best theoretical "fits," based on the "weight of the evidence" (Chamberlin 1966) have then been used to: 1) select the most likely of Botkin's conditions for each of the 1500 and 1826 "starting points" for 2) predicting the 1826, 1853, 1929, and/or 1945 Soap Creek Valley forest cover patterns (see Chapter VI).

Chapter III.
Identification of Agents of Forest Cover Change

He had found a large map,
Representing the sea,
Without the least vestige of land;
The crew were much pleased
When they found it to be
A map they could all understand.
—Lewis Carroll

This chapter considers the basic effects of three general types of agents affecting forest cover patterns in Soap Creek Valley during the past 500 years: processes and events, wildlife demographics (a type of process), and direct human actions.

TYPES OF AGENTS OF CHANGE

Causes of change to Soap Creek Valley forest cover patterns during the past 500 years were identified, documented, and measured through use of existing oral histories and of accepted oral history research methods. Changes were categorized temporally and spatially as the results of events, demographics, or human actions. Oral history informants (see Table 4) and other consultants (Table 5) considered and/or identified seven types of catastrophic events, four types of wildlife demographics, and seven types of human activities as having caused (or having the potential to have caused) identifiable changes to Soap Creek Valley forestlands. Table 8 lists changes documented for each of the 18 identified potential causes during the past 500 years, whether documentation was derived by Soap Creek Valley oral history research, and the earliest year for which documentation exists.

Events and Processes

Events that affect change in forest cover patterns can be categorized by frequency and intensity as catastrophic, normal, or unusual. Regular series of normal events that result in a given condition are called processes. Processes

Table 8. Causes of change to forest cover patterns, 1500-1999.

Type of change		SCV	O/H	OH/Yr.	Year
Catastrophic events					
1.	Disease epidemics	Yes	No	1918	1832
2.	Floods	No	—-	—-	—-
3.	Landslides	No	—-	—-	—-
4.	Snowstorms	Yes	Yes	1881	1881
5.	Volcanic eruptions	No	—-	—-	—-
6.	Wildfires	Yes	No	1935	1848
7.	Windstorms	Yes	Yes	1931	1931
Wildlife demographics					
1.	Animal extirpations	Yes	Yes	1915	1885
2.	Animal introductions	Yes	Yes	1846	1826
3.	Plant introductions	Yes	Yes	1853	1846
4.	Plant migrations	Yes	Yes	1905	1846
Human activities					
1.	Broadcast burning	Yes	No	1898	1826
2.	Farming and ranching	Yes	Yes	1846	1846
3.	Forestry and logging	Yes	Yes	1890	1890
4.	Hunting and fishing	Yes	Yes	1899	1826
5.	Land subdivision and home building	Yes	Yes	1910	1846
6.	Military and industrial development	Yes	Yes	1928	1857
7.	Transportation and communications	Yes	Yes	1846	1826

SCV Events, processes, or actions that possibly changed Soap Creek Valley forests.
O/H Change is documented in thesis oral histories (see Appendix A).
OH/Yr. Earliest year documentation exists in thesis oral histories.
Year Earliest year of documented forest cover change in Soap Creek Valley.

are a continuous series of actions or events that bring about a certain condition; e.g., the "growth process" that results in mature plants and animals. This section defines these terms and identifies the specific types of events and processes that are documented in this thesis.

Catastrophic events can be defined as "infrequent, high intensity disturbances" (Eddleman 1995). Catastrophic events that affect forest cover patterns include disturbances that radically affect large areas of landscape in relatively short periods of time. The Columbus Day Storm of 1962 and the eruption of Mt. St. Helens in 1980, for example, can be categorized as catastrophic events. These types of events are used in the Soap Creek Valley Oral History Series for two reasons: they can be responsible for rapid and profound changes in forest cover patterns over large areas of a region, and they often constitute important historical markers for a wide range of local people (see Chapter II; Appendix C). For example, although the eruption of Mt. St.

Table 9. Earliest documented forest cover changes, 1826-1931.

Type of change		SCV	O/H	Year	OH/Yr.
No major changes documented for past 500 years					
1.	Floods	No	—-	—-	—-
2.	Landslides	No	—-	—-	—-
3.	Volcanic eruptions	No	—-	—-	—-
Changes documented in thesis oral history references (see Table 1)					
	PRIMARY/SECONDARY SOURCES				
1.	Animal introductions	Yes	Yes	1826	1846
2.	Transportation and communications	Yes	Yes	1826	1846
3.	Hunting and fishing	Yes	Yes	1826	1899
4.	Broadcast burning	Yes	Yes	1826	1898
5.	Disease epidemics	Yes	Yes	1832	1918
6.	Farming and ranching	Yes	Yes	1846	1846
7.	Plant introductions	Yes	Yes	1846	1853
8.	Plant migrations	Yes	Yes	1846	1905
9.	Land subdivision and home building	Yes	Yes	1846	1910
10.	Wildfires	Yes	Yes	1848	1935
11.	Animal extirpations	Yes	Yes	1885	1915
12.	Military and industrial development	Yes	Yes	1857	1928
	PRIMARY SOURCES				
1.	Forestry and logging	Yes	Yes	1890	1890
2.	Snowstorms	Yes	Yes	1881	1881
3.	Windstorms	Yes	Yes	1931	1931

SCV Events, processes, or actions that possibly changed Soap Creek Valley forests.
O/H Change is documented in thesis oral histories (see Appendix A).
Year Earliest year of documented forest cover change in Soap Creek Valley.
OH/Yr. Earliest year documentation exists in thesis oral histories.

Helens had little direct impact on the forests of Soap Creek Valley, many current residents remember when it occurred, the general situation of their life at the time it occurred, and can describe certain local effects of its occurrence, which included distant sounds and light dustings of volcanic ash. By contrast, “normal events” can be characterized as “frequent, low intensity disturbances” (Eddleman 1995). Normal events may affect forest cover patterns more profoundly (yet be less noticeable) than catastrophic events due to their regularity and commonness. Such events include daily and seasonal changes in light, temperature, and moisture availability, fluctuations in local wildlife populations, periodic introductions of plant and animal diseases, and long-term climate. These types of events are generally well recognized and not a focus of this study. It is assumed that most individuals interested in forest cover patterns recognize the importance of normal variations in climate, topography, solar radiation, erosion, and mortality in the establishment and maintenance of local plant and animal populations.

Landscape changing events that do not normally occur, and are not catastrophic in scale, can be characterized as "unusual." Such events are defined as "infrequent, varying intensity disturbances" (Eddleman 1995). Soap Creek Valley examples include duration of a sudden cold spell (or "Deep Freeze") during October, 1955 (Silen, Olson, & Weber c.1993) and the "Dust Storm" of 1931 (Grant 1990; Rohner 1993; Hanish 1994). These types of events may also profoundly affect forest cover patterns, but are generally unrecognized for that capacity. For example, a longitudinal study of the 1955 cold spell determined that it had measurable long-term effects on individual tree vigor and mortality (Silen et al., c.1993), yet these effects went undetected by Soap Creek Valley subjects, several of whom were foresters, farmers, loggers, and ranchers. Conversely, the Dust Storm was well remembered by at least three Soap Creek Valley subjects and held responsible for fanning several Oregon Coast Range forest fires to the west of The Valley (Grant 1990) and damaging thousands of acres of timber to the northwest (Oregon Department of Forestry 1933), yet this could not be corroborated with scientific literature and seems to have had little effect on local forest cover patterns.

Summary. This thesis provides little focus on "normal" and/or "unusual" events that may or may not affect forest cover patterns. Certain types of regional catastrophic events will be considered for their value as historical markers and potential to affect local forest cover patterns, whether such effects have been noted in the immediate Soap Creek Valley area or not. Events involving factors such as tidal waves or glaciers, therefore, will not be considered simply because their potential to affect local conditions is so unlikely. Although the potential for catastrophic earthquakes or meteor strikes affecting Soap Creek Valley is perceived to be much greater today than it was even five or ten years ago, these types of events have had little or no apparent effect on Soap Creek Valley forest cover patterns in the past and they do not serve as useful historical markers because of the infrequency of their occurrence in this region. (A major geological fault is located in the northeastern portion of the study area, however, (Orr, Orr, & Baldwin 1992) and has the potential to create a memorable marker for local residents and visitors at any given time.)

Wildlife Demographics

Wild plant and animal populations and locations are the results of circumstances and events that are both incremental and profound. Many of the common processes that directly affect wildlife demographics, such as the growth, aging, and reproductive processes unique to each species, are relatively well known and will not be further considered in this thesis. The more pronounced processes of extinction, introduction, and migration of select types of wild plants and animals were of more general interest to oral history subjects and are more closely identified with changes in forest cover patterns; particularly changes to the species, ages, and locations of forest trees and understory vegetation.

Demographic processes, sometimes called “population biology” (Kimmins 1987), are combinations of circumstances and events that affect vigor, numbers, and associations of plants and animals in an area over time. The “conditions” attained by these processes can be defined as “patterns”; i.e., a point-in-time relationship among existing plants, animals, and/or microorganisms and their environment that can be spatially, temporally, or numerically described. Coarse changes in forest cover patterns caused by demographic processes can be divided into two categories; seasonal and persistent. Seasonal changes include effects of species migration or local food availability, are generally well known and recognized, and are not further considered in this study. Persistent changes, which include direct effects of catastrophic events, are often caused by biological processes initiated or mitigated by people as described in this chapter.

Extirpations are long-term (as opposed to seasonal or temporary) local extinctions or exterminations of plants and/or animals. Examples include extirpations of grizzly bears and California condors from western Oregon during the early 1800s. Feral animals are domestic animals that have “gone wild” and exist without direct human care, including wild populations of house cats, house mice, horses, and goats. Wild exotic plants are weeds and domestic plants that have gone wild, spawned “wildings,” or become “naturalized” since introduction by people (e.g., dandelions, bachelor buttons, orchardgrass, and wilding fruit trees). All four processes (plant and animal introductions, animal extirpations, and plant migrations) have well-documented histories of being influenced strongly by local human actions. In most instances, results are accidental (e.g., honeybees, weeds or nutria escaping human hosts and forming self-sustaining wild populations) as opposed to purposeful. Notable exceptions are exterminations of select species due to their undesirable qualities (e.g., grizzly bears, rattlesnakes, mosquitoes) or to their high market or sporting value (e.g., mink, elk, beaver).

Summary. The Soap Creek Valley Oral History Series identified at least four major types of wildlife demographic processes that have affected (or define) forest cover patterns in Soap Creek Valley:

1) Animal extirpations (esp., vertebrates);
2) Animal introductions (esp., feral, game, and domestic vertebrates);
3) Plant introductions (esp., exotic weed and domestic vascular plants);
4) Plant migrations (esp., native, weed, and domestic vascular plants).

Human Activities

A third type of general agent identified as causing or characterizing changes in Soap Creek Valley forest cover patterns (in addition to catastrophic events and wildlife demographics) is the actions of local human residents and visitors. Such actions can be direct (e.g., plowing a field or logging a stand of trees) or indirect (e.g., selling property to a developer or a national declaration of war are actions that can directly influence whether or not an area is managed, how and why it is managed, etc.), and based on need (e.g., subsistence hunting and fishing and/or gathering firewood for fuel), or driven by cultural values (e.g., planting a lawn or selling logs). For the purposes of this thesis, only actions commonly recognized as directly affecting Soap Creek Valley forest cover patterns are considered, whether driven by human need or by cultural values.

Summary. Examination of Soap Creek Valley data shows that changes to forest cover patterns have been constant and dynamic throughout historical time, and probably throughout prehistoric time as well. In general, historical causes of change can be characterized as events, processes, and/or human activities. Events that have affected Soap Creek Valley forest cover patterns can be roughly divided into three categories: normal, unusual, and catastrophic. Processes and activities can be similarly subdivided. This study focused primarily on the effects of identifiable catastrophic events, of wildlife demographic processes, and of human activities on The Valley's forest cover patterns.

EFFECTS OF CATASTROPHIC EVENTS

Catastrophic events are defined as "sudden and violent change[s] in the surface of the earth" that can dramatically change forest cover patterns over large areas in short periods of time (Allen 1984). Such changes have been measured in thousands of acres affected, millions of dollars worth of structures destroyed, billions of board feet of timber damaged, and/or dozens, hundreds, or thousands of human lives lost. Examples of well-known catastrophic events in the Pacific Northwest include the Mt. St. Helens eruption of May 18, 1980, which "devastated" about 100,00 acres of land, blew down a billion board feet of timber, and killed at least 70 people (Koenninger 1980), the Tillamook Fire of August, 1933, which burned over 220,000 acres of timber in a single day (Morris 1934; Zybach 1983), and the Columbus Day Storm of October 12, 1962, which blew down over seven billion feet of timber in a few hours time, mostly in western Oregon (Lucia, c.1963).

This thesis considers seven types of regional catastrophic events that may have affected Soap Creek Valley forest cover patterns during the past 500 years: human plagues, floods, landslides, snowstorms, volcanic eruptions (see Chapter I), wildfires, and windstorms (see Tables 8 and 9). The term "regional" is used to include boundaries of the Willamette Valley, Willamette River basin, northwest Oregon, western Oregon, the Oregon Coast Range, the Douglas-fir Region, and/or the Pacific Northwest, depending upon scale, location, nature and/or extent of individual occurrences. .

Disease Epidemics (1770-1999)

Disease epidemics can affect forest cover patterns by directly impacting local plant, animal, and human populations. Effects can also be indirect. For example, diseases that kill large numbers of trees by massive foliage losses can initially change horizontal and vertical patterns of the forest and result in increased litter and sunlight on the forest floor (Rowley 1990: personal communication; personal observation). Such events may be followed by wildfires, which are often more intense and wider spread than fires in unaffected forests because of greater flammability provided by dead snags and litter compared to healthy trees and green foliage (Oregon Department of Forestry 1933; Morris c.1936; Rowley 1996). In Soap Creek Valley most plant and nonhuman animal diseases seem to have had little impact on local forest cover patterns during historical time. Human diseases are another matter.

Forest cover patterns of Soap Creek Valley were undoubtedly affected by the widespread occurrence of human disease and mortality in the Douglas-fir Region during the 1770s and 1830s (Minto 1900; Scott 1928; Cook 1955; Boyd 1986; 1990; Zybach, et al., 1995). Before the advent of deadly exotic diseases in the 1770s, the Pacific Northwest was one of the most densely inhabited nonagricultural regions in the world, with a total population estimated as high as 200,000 people (Boyd 1990). The advent of smallpox, malaria, measles, influenza and other diseases—introduced by explorers and traders from Europe, Africa, and other areas of the world—proved deadly to many native families and communities. Willamette Valley Kalapuyan peoples (see Figs. 1 and 5; Maps 4 and 10) were decimated by disease, probably malaria, in 1831 and 1832 (Boyd 1990). By 1833, the disease had become endemic in the Willamette Valley and by 1841, a Kalapuyan population estimated to have numbered as many as 16,200 people in the early 1770s (Boyd 1990), had been reduced to barely 600 individuals (Wilkes 1845); over 96% of the people had died within a few generations time, perhaps most of them within a few months of one another in a single year, 1832. The collapse of local families and communities in the Willamette Valley included those located in the Marys River and Luckiamute River basins (Map 10); individuals most likely to frequent Soap Creek Valley on a regular basis and to claim a legitimate jurisdiction over its resources (see Table D.1).

Dramatic reductions in local human populations resulted in substantially reduced needs, opportunities, and/or abilities for broadcast burning (prescribed human fires covering large, contiguous surface areas of land), firewood gathering, and cooking fire escapements in Soap Creek Valley. Local and regional reductions

Fig. 5. Sketch of Kalapuyan male near Marys River tributary, 1841 (Wilkes 1845). This drawing was made by A. A. Agate near present-day Monroe, Benton County, OR (Zybach 1989). The foreground and background plants represent conditions typical of much of the western Willamette Valley and eastern slope Oregon Coast Range during presettlement time (Boyd 1986), including most Soap Creek Valley floodplain and foothills prior to 1846.

in these human activities likely contributed to increased: afforestation of Willamette Valley meadows and prairies (Fig. 6); populations of local game animals (Sondenaa 1991); and incidence of coarse woody debris on forest floors and riparian areas (Crosby 1986). However, these effects began to occur nearly 15 years before initial settlement of Soap Creek Valley by white and black American immigrants in 1846 (Fagan 1885; Moore 1947; Rawie 1995; see Table D.2) and were unnoted in oral histories used for this study.

The persistent effects of Kalapuyan burning are well documented (Boyd 1986) and can be discerned in contemporary drawings (Zybach 1989; see Figs. 5 and 6) and photographs (Grabe 1990; Glender 1994; Cook 1995). The afforestation (the establishment of forest trees in areas with no previous record of being forested) of Soap Creek Valley meadows and prairies that resulted from collapse of local Kalapuyan populations is evidenced by widespread occurrences of Douglas-fir stands established between 1830 and 1845 within The Valley's

Map 10. Nations and languages of western Oregon, c.1788. Map derived from GIS layers established for entire US Douglas-fir Region (Zybach, Barrington, & Downey 1995). The eight Willamette Valley Kalapuyan nations shown are: 4) Atfalati (Tualatin River), 42) Yamel (Yamhill River), 20) Luckymute (Luckiamute River), 7) Chapanafa (Marys River), 21) Lumtumbuff (Long Tom River), 6) Calapooia (Willamette River southern headwaters), 1) Ahalpam (Calapooia and Santiam Rivers), and 2) Ahantchuyuk (Pudding River). The Ayankeld (5; also known as Yoncalla) nation was also Kalapuyan, but located to the south, on the Umpqua River. The Takelma and Latgawa (35 and 19; interior Rogue River valley) nations may have also been Kalapuyan, and shared land management strategies, technologies, and some language similarities with the more northern nations. Soap Creek Valley was the southern-most boundary of the Luckymute peoples and was likely shared with members of the adjacent Chapanafa nation during different seasons of the year. Most of the people belongiong to these 11 named Nations died within a few months time in 1831 and 1832.

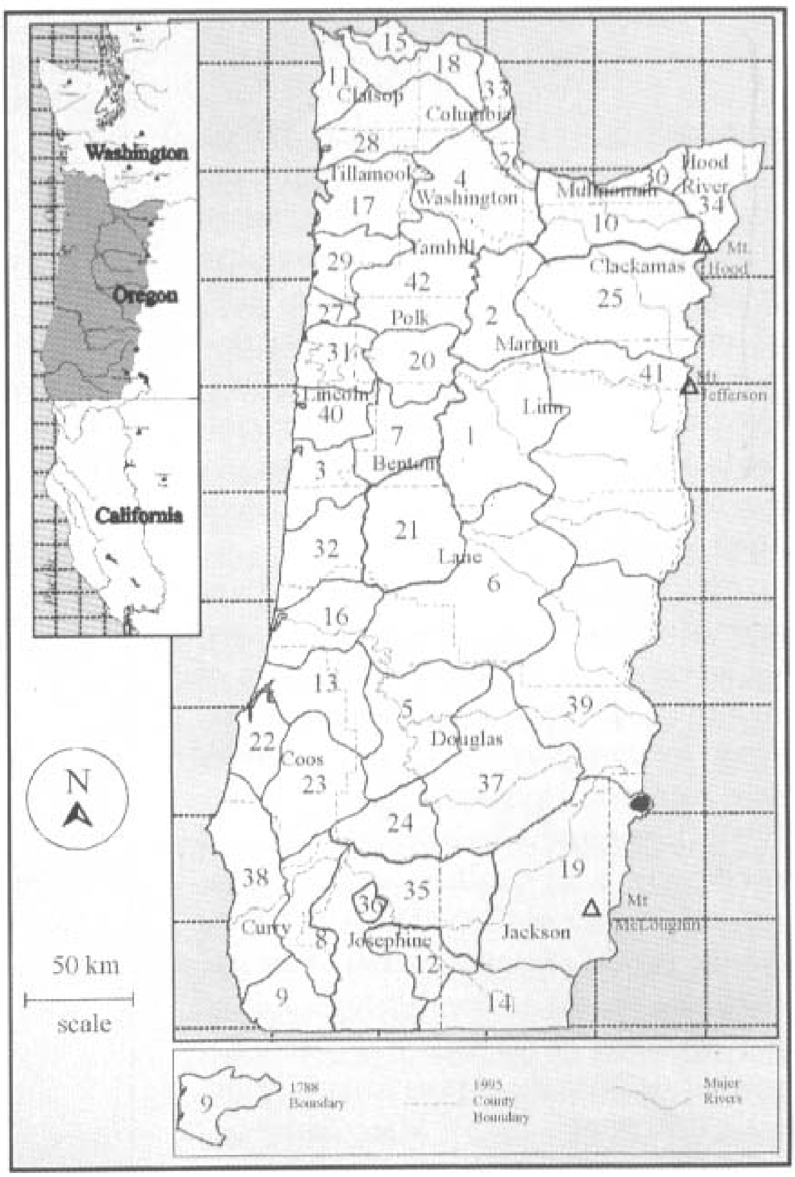


Fig. 6. “The Wallamet Valley from a Mountain” 1845 (Mackey 1974). Paul Kane created this painting from a sketch he made from a peak near the Willamette Valley Jesuit Mission in January, 1847 (Kane 1925). The painting is currently in the possession of The Royal Ontario Museum in Canada. Note the presence of white-tail deer and the beginnings of prairie afforestation that followed the decimation of Kalapuyan peoples in the early 1830s. Compare this painting with descriptions by Neall (1977) of the Willamette Valley during the same period of time, in 1845:

> The leading features of the Willamette Valley and the Tualatin plains were peculiar and strange to me as compared with any other country I had seen. Among the striking peculiarities was the entire absence of anything like brush or undergrowth in the forests of fir timber that had sprung up in the midst of the large plains, looking at a distance like green islands here and there dotting the vast expanse of vision. The plains covered with rich grasses & wild flowers looking like our vast cultivated fields, and where the rolling foothills approached the level valley these spurs would be sprinkled with low spreading oak trees, frequently with a seeming regularity that would seem unlike nature’s doing, and at a distance like orchards of old apple trees.

boundaries (Nettleton 1956; Johnson 1996: personal communication). The process of conifer afforestation following cessation of Indian burning was noted and described by a number of pioneer settlers in western Oregon. For example, Warren Vaughn remarked on conditions in 1856, in the Tillamook Bay area northwest of Soap Creek (Vaughn c.1890):

> At that time there was not a brush or tree to be seen on all those hills, for the Indians kept it burned over every spring, but when the whites came, they stopped the fires for it destroyed the grass and then the young spruces sprang up and grew as we now see them.

Another catastrophic human disease outbreak that affected Soap Creek Valley families was the international flu epidemic of 1918 (Crosby 1976). This epidemic did not seem to have an impact on local forest cover patterns, partly because only a relatively small number of local people were directly affected by the 1918 event (Rawie 1994; Vanderburg 1995; Hindes 1996), as compared to near extinction of Kalapuyan families that occurred in the same area nearly 90 years earlier.

In the early 1900s, one other catastrophic loss of local lives, noted by Soap Creek Valley informants, was a dramatic decline in jackrabbit numbers due to “wobbles,” or “warbles” (Rohner 1993; Olson: 1994). It is not known what direct or indirect effect the sudden decimation of local jackrabbits had on forest cover patterns, or what the current status of these animals is in Soap Creek Valley.

Summary. Human plagues in the late 1700s and early 1800s appear to have indirectly, but profoundly, impacted Soap Creek Valley forest cover patterns. Although this relationship was unnoted by this study’s oral history subjects, several interviewees seemed familiar with prehistoric broadcast burning activities and their lasting effect on early historical Soap Creek Valley landscapes (e.g., Starker 1984; Rowley 1996). Secondary effects of the epidemics likely included decreased: frequency and extent of broadcast burnings, number and extent of campfire escapements, and range and intensity of firewood gathering. These secondary effects are in addition to direct effects caused by reductions in human hunting, fishing, and food plant gathering and processing activities. There is little evidence that other animal or plant diseases played significant roles in affecting Soap Creek Valley forest cover patterns during the past 170 or more years.

Floods and Droughts (15,000 BP-1999)

Between 15,000 and 12,800 years ago, a series of 50 to 100, or more (Allen 1989: personal communication), “cataclysmic” floods coursed down the Columbia River from an origin in western Montana (Allen & Burns 1986). These floods, named “Missoula” for their point of origin, or “Bretz” for their discoverer, filled the Willamette Valley with water, mud, icebergs, and rocks, as evidenced by contemporary existence of glacial erratics and other geological deposits and formations (Allison 1953; Allen 1984; Map 4). The repeated nature of the impoundments (which stretched nearly 100 miles from present day locations of Portland, Oregon to Eugene, Oregon and attained depths over 400 feet above sea level) resulted in a series of soil deposits called Willamette silts (Balster & Parsons 1969). These silts raised the floor of the Willamette Valley to an elevation over 350 feet in the Soap Creek Valley area (Reckendorf 1993; see Map 5).

The Bretz Floods are estimated to have occurred, on average, at 20 to 40 year intervals for over 2,000 years. Ephemeral Willamette Valley lakes that resulted from these events are estimated to have existed only a few days or weeks per flood (Orr et al., 1992). These lakes have been named “Lake Allison” (see Map 4), after their discoverer, Ira S. Allison, an OSC geologist (Allen 1989: personal communication). Maps of glacial “erratics” (rocks borne on Bretz flood tides—probably on icebergs or tree roots—from their origins in Canada, Montana, and Idaho) provided clues needed to theorize the extent of the floods in the Willamette Valley (Allison 1953; 1988: personal communication). At its greatest size, Lake Allison probably extended deep into Soap Creek Valley, creating islands of Coffin Butte and Tampico Ridge (see Maps 2 and 5). Deposits from the floods created the principal agricultural soils in The Valley (Balster & Parsons 1968; Knezevich 1975). These soils were among the first private properties claimed and settled in Benton County and Soap Creek Valley, beginning in 1845 or 1846 (Fagan 1885; Moore 1947; Maps 2 and 5; Table D.2).

Currently, Soap Creek Valley seems to be protected from the effects of large scale flood. The floods of 1861, 1890, 1945, 1964, and 1996 (see Fig. 7), for example, had major effects in other areas of the Willamette Valley and Oregon Coast Range (Benner & Sedell 1997; Taylor 1999: personal communication), but little apparent impact on Soap Creek Valley (see Figs. 7 and 8; Map 2; personal

Fig. 7. Soap Creek floodplain, T. 5 S., R. 10 W., S. 11-14, & 24, 1890-1945. This is one of a series of annotated c.1936 aerial photographs showing the extent of historical flood levels in the Willamette Valley. Compare to Maps 2 and 5. Photos may have been created by USGS or USDA Soil Conservation staff in the mid-1940s (Perry 1989: personal communication). Original series located at OSU Valley Library Map Room. Annotations have been highlighted for purposes of clarity.

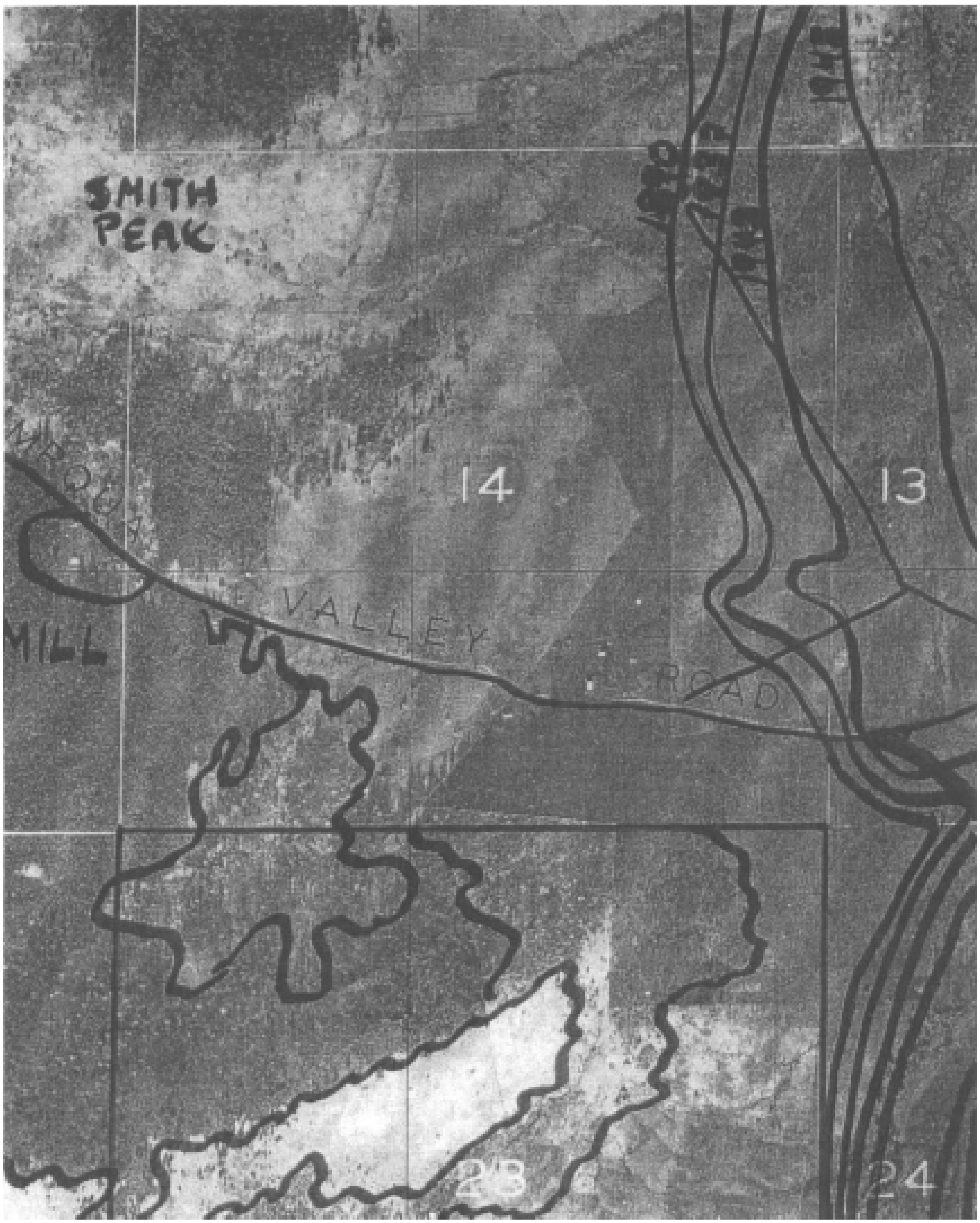


Fig. 8. Soap Creek, SW from Tampico Road Bridge: dry and flood, 1998.
Top Photograph. September 2, 1998: Late summer drought conditions have reduced Soap Creek to a shallow, slow moving stream. Note dry exposure of most creek bed and location of fencing in comparison with bottom photograph. Photograph by author.
Bottom Photograph. December 28, 1998: This peak 1998 flow condition was greater at this location than for either of the 1996 flood events (personal observations), which, in turn, generally equaled or exceeded the greatest flood extents in the Willamette Valley since the 1964 floods (see Table 10; Benner 1998: personal communication). These photographs, in combination with Fig. 7 and Map 5, demonstrate the relative lack of local flood effects in lower Soap Creek Valley when compared to other areas of the Willamette Valley during the same time and day (see Fig. 9). Note that Soap Creek has barely left its banks and the apparent rapid rate of streamflow caused by the drainage of most of Soap Creek Valley south of Tampico Road (see Maps 2 and 5). Photograph by author.

Fig. 8

observation). Lack of historical influence by flooding on Soap Creek Valley forest cover patterns is probably due to the steepness of Soap Creek Valley hillsides (see Map 5), the relatively large number of creeks within The Valley's boundaries (Map 2), and the relatively high elevation of The Valley's floodplain compared to other Oregon Coast Range tributaries of the Willamette River (Fig. 9). No oral history interviewees recounted particular damage from flooding, although <u>Hanish</u> (<u>1994)</u> described the "roaring" of Berry Creek, a Soap Creek tributary to the immediate north of Soap Creek Valley (see Maps 2 and 9), that followed heavy rains in the 1930s.

This result is supported by photographs of Soap Creek taken from the Tampico Road Bridge (see Map 2) during peak flows of the February, 1996 (in possession of author) and December, 1998 floods (Fig. 8).

Fig. 9. Corvallis area flooding, December 28, 1998. This photograph was taken upstream from the mouth of Soap Creek, near the mouth of the Marys River, at approximately the same time as the bottom photograph on Fig. 8 was taken (Sanders 1998). Photograph by Karl Maasdam, <u>Corvallis Gazette-Times</u>, December 29, 1998.

Dates and measures of waterflow in the Soap Creek Valley area during times of flooding and drought are listed in Table 10. Seasonality of these events

Table 10. Local area flood and drought events, 1861-1977. Data is from Moffatt, Wellman, & Gordon (1990), Benner & Sedell (1997), and Taylor (1999: personal communication).

Location	Year	Mo.	Event	c.f./sec.	Ave. c.f./sec.	Feet
Will./Harrisburg	1861	Dec.	Flood		12,150	20.5
Will./Albany				340,000	14,480	41.0
Will./Salem				500,000	23,610	47.0
Will./Albany	1881	Ja/No?	Flood	266,000	14,480	37.8
Will./Salem				428,000	23,610	44.3
Will./Harrisburg	1890	Feb.	Flood		12,150	20.1
Will./Albany				291,000	14,480	38.9
Will./Salem				448,000	23,610	45.1
Will./Salem	1923	Jan.	Flood	348,000	23,610	38.3
Long Tom/Monroe	1939	Sep.	Drought	7	770	
Will./Salem	1940	Aug.	Drought	2,470	23,610	3.6
Will./Albany		Sep.		1,840	14,480	
Long Tom/Monroe	1943	Jan.	Flood	19,300	770	17.1
Will./Harrisburg					12,150	19.1
Will./Harrisburg	1944	Oct.	Drought	1,990	12,150	
Luckiamute/Peedee		Sep.		7	458	
Will./Harrisburg	1945	Dec.	Flood	210,000	12,150	19.7
Marys/Rock	1946	Aug.	Drought	0.2	51	
Luckiamute/Hoskins		Dec.	Flood	5,560	209	13.2
Luckiamute/Hoskins	1949	Feb.	Flood	5,560	209	
Marys/Rock	1952	Sep.	Drought	0.2	51	
Marys/Rock	1955	Dec.	Flood	2,190	51	6.8
Luckiamute/Hoskins	1962	Sep.	Drought	4	209	
Rickreall/Dallas	1964	Dec.	Flood	7,160	148	8.8
Marys/Philomath				13,600	462	20.7
Luckiamute/Peedee				15,700	458	20.1
Luckiamute/Suver				32,900	905	34.5
Luckiamute/Suver	1966	Aug.	Drought	0.7	905	
Marys/Philomath	1967	Aug.	Drought	0.6	462	
Luckiamute/Peedee				7	458	
Marys/Philomath	1974	Nov.	Flood		462	20.9
Marys/Rock	1977	Dec.	Flood		51	13.2

Location	General location of functioning water gauge at time of event.
C.f./sec.	Cubic feet per second = measured rate of waterflow.
Ave. c.f./sec.	Average rate of waterflow at gauge location, measured in c.f./sec.
Feet	Number of feet above flood stage.

is apparent. Flooding occurs during times of heavy Winter rains, from November to February, and droughts occur during late Summer and early Fall, from August to October (see Fig. 8; Knezevich 1975). The relative magnitude of these events is also indicated on Table 10, with major floods attaining waterflow levels 10 and 20 times (and more) above average levels, and major droughts reducing streamflows to less than 1/100—and even 1/1000—of their average. Although there is no record of "catastrophic" droughts in western Oregon during historical time (Jones & Bradley 1995), seasonal events correlate to times of greatest perceived "fire danger" and to regional wildfires of greatest magnitude (Morris 1933; Zybach 1988). Seasonal droughts also provide conditions that favor native conifer forests over hardwoods in absence of disturbance (Franklin 1981) and grasslands (Risser 1985) and oak savannah (Hills 1974) when subject to periodic fires, grazing, and/or other management practices. All three conditions (conifer forest, grassy prairie, and oak savannah) characterize major portions of Soap Creek Valley at one time or another from late prehistoric time to the present, strongly indicating a history of seasonal droughts for the past several centuries. Finally, consequences of Soap Creek Valley streams going dry, or nearly dry, during times of seasonal or prolonged drought (see Fig. 8) must be considered when measuring effects on local aquatic plant and animal populations, including anadromous fish species.

<u>Summary</u>. Soap Creek Valley forest cover patterns have been little affected by localized or regional flooding, whether seasonal or catastrophic in size and nature. This lack of influence is likely due to The Valley's elevation and geomorphology, which allow for rapid draining of its hillsides and floodplain. These characteristics, in turn, contribute to the severity of flooding downstream; in lower elevations of Soap Creek, the Luckiamute River, and the Willamette Valley (Fig. 9; see Map 8). Seasonal and prolonged droughts in Soap Creek Valley, while not catastrophic in nature, increase potential for wildfire, encourage conifers, oak, and grasses over other types of vegetation, and affect populations and locations of wild aquatic plants and animals.

Landslides (minor effects)

More than 75% of Soap Creek Valley is classified as part of the "Looney unit," one of nine major geomorphic landforms in the Willamette Valley (Balster and Parsons 1968). This classification is in common with most eastern slope Oregon Coast Range hillsides in Benton County. Looney unit features are typified by "steeply sloping terrain," of which "by far the greatest part . . . must be considered an unstable landscape" (Balster and Parsons 1968). Despite the characteristic steepness of local terrain and the large amount of road building and clearcut logging activity that has taken place during this century, Soap Creek Valley appears less affected than other areas of the Douglas-fir Region by major landslides (Thwaites 1959; Allen & Burns 1986; Phillips 1989: personal communication; Benda 1990; Zybach 1996b) and/or recent landslides of any magnitude (Rowley 1990: personal communication; personal observations 1990; 1999). Rowley (1996) discusses locations and extents of landslides in areas adjacent to Soap Creek Valley, but failed to recall major occurrences within The Valley itself. There is evidence of minor landslide activity in Soap Creek Valley north of Glender Hill and east of Lewisburg Saddle (see Map 2; Rowley 1996), but these events seemed to have left local wildlife populations and current drainage patterns of The Valley unaffected. According to recent (July, 1999) personal observations and oral history evidence, historical impacts of landslides on Soap Creek Valley forest cover patterns have been slight or negligible.

Snowstorms and Freezes (1830-1999)

Catastrophic snowstorms have affected Soap Creek Valley forest cover patterns for over 135 years. These events are not often referred to in terms of "catastrophic," but snowstorms in 1861-62 (Oliphant 1932), 1881-82 (Oliphant 1932; Nettleton 1956; Jackson 1980) and 1937 deposited several feet of snow throughout the Willamette Valley, killing thousands of livestock and causing hundreds of buildings to collapse. These storms resulted in millions of dollars of damage and notable changes to local forest cover patterns. Several informants recalled the 1937 snowstorm (Rohner 1993; Hanish 1994; Olson 1994; Vanderburg 1995), while Starker (1984; see Fig. 10) and Dickey (1995) provide detailed accounts of the 1881-82 event. Dickey (1995) also provided a significant amount of contemporaneous documentation regarding dates and local effects of the 1937 event and reported snowstorms of 1919-1920 and 1969 as severe (see Table 11).

According to Soap Creek Valley informants, primary effects of snowstorms on forest cover patterns are bending and breaking of trees and tree limbs (Starker 1983; Rowley 1996) and flattening of young stands of trees (Rowley 1990: personal communication). A secondary effect is afforestation of fields and meadows made possible by mass elimination of grazing animals (Longwood 1940; Kay 1993: personal communication). As in instances of forestation resulting from reduced human populations, this latter observation is evidenced by conifer stands in the Soap Creek Valley area that date to 1862, 1882, and 1938 (Longwood 1940; Johnson 1996: personal communication).

Reporting on the snowstorm of 1862, Oliphant (1932) observed:

> The winter of 1861-62 was probably the worst in the history of the Pacific Northwest . . . Deep snow covered the earth, and the watering places froze over. Very low temperatures were registered, and by January, 1862, cattle were literally dying by thousands. In all the settled parts of the Pacific Northwest—western Oregon, western Washington, Vancouver Island, eastern Oregon, and eastern Washington—a great tragedy was witnessed.

Surprisingly, the snowstorm of 1951, one of the deepest on record (see Table 11), wasn't mentioned by any of the oral history subjects or consultants. This may have been due to better construction of barns and lesser dependency on livestock in 1950 than before that time, among other factors; for example, see Oliphant (1932) regarding the effects of repeated melting and freezing of snow and ice on livestock mortality between 1847 and 1890 in western Oregon. Nettleton (1956) reported four feet of snow on "Ridge Road" (subsequently renamed Nettleton Road: see Map 2 and Table 2) during the 1950 snowstorm, but makes no mention of damage to trees or livestock.

Fig. 10. T. J. Starker with 1881-1882 "Blue Snow" oak evidence According to Starker (Jackson 1980; Starker 1984), the 1881-82 winter snows were so severe that local ranchers had to fall oak trees so sheep could eat new buds and young bark as fodder.

Table 11. Major snowstorms in Corvallis and Portland, OR, 1893-1999

Year	Date (C)	Corvallis	Portland	Date (P)
1893	Jan.	17		
1909	Jan.	23	12	Jan. 5-10
1911	Jan.	12		
1916	Jan.	22	13	Jan. 30-Feb. 3
1917	Feb.	12		
1919	Dec.	20	17	Dec. 9-11
1937	Jan.	11	16	Feb. 1
1943	Jan.	18		
1950	Jan.	52	22	Jan. 9-18
1954	Jan.	13	10	Jan.
1968			16	Dec.
1969	Jan.	24	18	Jan.
1971	Jan.	15	Jan.	
1989	Feb.	11	Feb.	
1990	Feb.	11	Feb.	
1993	Feb.	15	Feb.	

Year	Year of event
Corvallis	Snowfall measured in Corvallis, OR (Taylor 1999)
Date (C)	Corvallis monthly total (Taylor 1999)
Portland	National Weather Service measures at Portland International Airport (Manning c.1996)
Date (P)	Dates of measured snowfall in Portland (Manning c.1996)

Good records for prolonged or severe freezing are not available. Allen (n.d.) uses the Columbia River as a regional yardstick and reports the river “froze over” from Portland to Vancouver on at least 12 occasions: 1830, 1833, 1840, 1842, 1884, 1888, 1890, 1891, 1894, 1896, 1919, and 1930. Note that the Columbia has frozen over only twice in the last 100 years and never in the last 70 years. The construction of major dams in the 1930s and 1940s may have something to do with this fact, as the Columbia has not frozen over once since that time. Also note that the periods of greatest freezing occurred in the 1830s to 1840s (four events) and 1880s to 1890s (six events). Kane (1925) reports on another, unlisted, 1840s event, on January 11, 1847:

> The morning after our arrival the thermometer stood at 7° below zero. Such intense cold had not been felt by the oldest inhabitants of these regions. It had the effect of killing nearly all the cattle that had become acclimated, as they are never housed. The Columbia, too, was frozen over, an unprecedented circumstance, so that my travels were for a time interrupted.

Note that Allen apparently missed the well-documented 1847 event and that Kane seems unaware of the two earlier 1840s' freezes. Oliphant (1932) cites Kane, among others, regarding impacts of the 1847 snows and freeze on Willamette Valley livestock, likely including a number of animals in the Soap Creek Valley area as well. What effect, if any, these events may have had on the forestlands of Soap Creek Valley is unknown. One type of freeze that has been known to affect stand structure, however, are "silver thaws," when tree tops, branches, and new growth can break away from trees and shrubs due to the weight of ice that can build up in a few hours time. Nettleton (1956) reported extensive local tree damage resulting from a "heavy wet snow" in October, 1936 (this may have been the 1937 event) and from a "sleet storm" in 1942.

Summary. Major snowstorms, freezes, sleet storms, and silver thaws have had a significant impact on the landscape history of Soap Creek Valley. In the past century, at least 14 separate events have resulted in 10 inches or more measurable snowfall. Nine of these events have occurred in January, with the remainder occurring in either December (one) or February (four, including the last three in a row). Snows, freezes, and sleet have affected forest cover patterns in two primary ways: by directly breaking and killing trees and shrubs, and by killing livestock that would have otherwise suppressed new tree growth and regeneration. Silver thaws may affect virtually all woody plants in an area, resulting in widespread breakage of tree and shrub tops and limbs, while major snowstorms seem to affect only patches of trees; age may be a factor, as younger trees seem more seriously affected by snow than older or larger trees (Nettleton 1956). However, snow damage appears more likely than ice to cause tree mortality, due to the weight of snow "folding over" groups of trees rather than simply "pruning" them of new growth and weak limbs (Rowley 1996).

Wildfires (12,800 BP-1941)

Detailed written records of landscape changing fires in the Willamette Valley, including Soap Creek Valley, date to the Fall, 1826 accounts of David Douglas and Alexander R. McLeod (Douglas 1905; Davies 1961). The rings of living and dead trees within Soap Creek Valley boundaries extend the record hundreds of additional years, to at least 1602 (Starker 1939), and to about 1539 in adjacent watersheds (Newton 1970). Pollen counts and archaeological analyses paint a more general picture, but add another 10,000 to 15,000 years to the history of fire and changing landscape patterns in western Oregon forests (Hansen 1941; 1942; 1947; 1967), including those of Soap Creek Valley.

During most postglacial time, from Bretz Floods of the last ice age to present, there has been a pattern of periodic fires in western Oregon (Hansen 1941; 1947; Pyne 1983) that favored establishment and maintenance of wet and dry grassland prairies (Risser 1985), brakes, balds, meadows, camas patches (Smith 1978), berry patches (Boyd 1986), oak savannah (Hills 1974), and even-aged stands of Douglas-fir (Munger 1940; Burke 1979), grand fir (personal observation), and western hemlock (Silen 1989: personal communication). Hansen (1941), remarking on differences between forest evolution history in western Oregon and western Washington, noted:

> Pollen analysis of . . . west central Oregon shows that postglacial forest succession differed from that in the Puget Sound region. This may have been due to the existence of forests in the Coast Range of Oregon during the latter part of the Pleistocene, and the occurrence of many periodic holocaustic fires during postglacial times.

Most of these Oregon Coast Range fires were probably started by people (Pyne 1983), and usually on purpose (Zybach 1988). Another possible cause of periodic fire in the Soap Creek Valley area is lightning, but it is an unlikely source of regular ignition (Burke 1979; Shumway 1981), even on a seasonal basis. The Willamette Valley has one of the lowest rates of lightning strikes in the United States (Taylor 1999: personal communication). Thunderstorms are considered "uncommon" for the entire Douglas-fir Region (Shumway 1981) and Morris claims lightning-caused fires are "rare over most of western Oregon" (Boyd 1986). Nearly all of the historic "Great Fires" and historical prairie fires of large magnitude in the Oregon Coast Range and the Willamette Valley since 1826 can be traced to sources of known (or highly suspected) human ignition (Zybach 1988).

Tree rings can reveal fire scarring on individual trees that date ground fire events (Starker 1939) or, in aggregate with other trees, stand replacement events in which a wildfire "crowns" (leaves the ground and enters the upper branches and tops of forest trees) and kills most or all of the trees within its reach. In referring to late prehistorical and early historical forests of western Oregon, Munger (1940) noted:

> The paths of the great forest fires of the last century or two are plainly marked by even-aged stands, consisting to the extent of at least 90 per cent of Douglas fir (if within the preferred habitat of this tree), regardless of the proportion of Douglas fir in the original fire-killed stand.

The most recent record of a large scale wildfire (as differentiated from seasonal broadcast burning practiced by local Kalapuyan families) in Soap Creek Valley is 1848, according to Starker's interpretation of local tree rings (Starker 1939). This conclusion is supported by the historical record, including military observations to the immediate north of Soap Creek Valley, on August 25, 1849 (Haskin 1958):

> The mountains were enveloped with such a dense mass of smoke, occasioned by some large fires to the south of us, that we could see but little of the surrounding country. These fires are of frequent occurrence in the forests of Oregon, raging with violence for months, until quelled by the continued rains of the rainy season.

<u>Summary</u>. In the 150 years since 1849, there are scattered accounts of only a few minor wildfires in the Soap Creek Valley area (Kessinger 1999). Most of these amounted to less than a few dozen acres of forest (Nettleton 1956; <u>Hanish 1994</u>; <u>Davies 1996</u>; <u>Rowley 1996</u>), or were confined to areas of sloping grassland (<u>Rohner 1993</u>), or even to a single tree (<u>Olson 1994</u>). Thus, catastrophic forest fires have had little or no direct impact on plants and animals of Soap Creek Valley since 1849, or possibly even earlier. This finding is likely a partial result of insufficient local fuels (trees and woody shrubs) to carry a large fire; a condition

caused by seasonal Kalapuyan broadcast burning and firewood gathering practices in the late 1700s and early 1800s, and maintained by intensive livestock grazing, firewood gathering, fence building, and farming from the mid-1840s until the early 1900s.

Windstorms (1931-1999)

One of the primary reasons suggested for great sizes, ages, and volumes of trees and forests in the Douglas-fir Region compared to forests in eastern US, Asia, the tropics, and other areas of the world, is a relative lack of stand-replacing windstorms (Stout 1981; Franklin & Dyrness c.1988). Still, there is an extensive history of catastrophic windstorms in the Pacific Northwest, dating to the 1780s, that has destroyed large tracts of trees in many areas of western Oregon and Washington (Henderson et al., 1989).

The east-west orientation of Soap Creek Valley, and its location on the eastern slope of the Oregon Coast Range, seems to protect it from southerly hurricanes, such as the 1962 Columbus Day Storm (Lucia 1962), and from major Pacific storms from the west, including the November 1981 "Friday the 13th" storm in western Oregon and the 1921 "Big Blowdown" that leveled 8 billion board feet of timber in western Washington (Henderson et al., 1989). Rowley (1996) described and mapped impacts of the Columbus Day Storm on OSU forestlands in Soap Creek Valley and Blanchard (1995: personal communication) provided similar descriptive and cartographic evidence for private forestlands in the same area. In general, impacts of wind on Soap Creek Valley forest cover patterns appear minor when compared to effects on other forestland over much of the Douglas-fir and Oregon Coast Range regions (Lucia 1962).

Rohner (1993) and Hanish (1994) described effects of the 1931 "Dust Storm" from the east, responsible for causing damage to hundreds of acres of trees to the northwest (Oregon Department of Forestry 1933) and spreading a number of Oregon Coast Range wildfires to the west (Grant 1990). Again, effects on Soap Creek Valley forests seem relatively minor when compared to other impacts in the region. Garver (1996: personal communication) noted some "curious, circular" Soap Creek Valley forest damage patterns caused by the

“Friday the 13th” windstorm (see Fig. 2 for an example of windfall from that event). With the exception of the Columbus Day Storm in 1962, most other observers failed to recall any significant changes to Soap Creek Valley forests caused by wind during historical time.

Summary. Several types of catastrophic events have affected forest cover patterns of the Willamette Valley, the Oregon Coast Range, and the Douglas-fir Region during the past 500 years. These events include human plagues (Scott 1928), floods (Benner and Sedell 1997), landslides (Allen and Burns 1986), snowstorms (Dickey 1995), freezes (Kane 1925), volcanic eruptions (Koenninger 1980), wildfires (Starker 1939), and windstorms (Henderson et al., 1989). However, with the probable exceptions of human plagues during the 1830s and snowstorms between 1846 and 1951, most of these events have had a relatively minor effect on Soap Creek Valley forest cover patterns. Furthermore, most landscape changing events in Soap Creek Valley display a remarkable seasonality. For example, major droughts and wildfires occur in August and September (and very occasionally in July or October), major floods occur between November and February, and major snowstorms usually occur in January, with occasional occurrences in December or, more recently, in February. Long-term patterns also show strong correlations to specific periods of time, with major droughts, snows, floods, and freezes tending to occur within a few years or decades of one another over the course of a century. Examples include the Columbia River freezes of 1884-1896, the local snowstorms of 1909-1919, the regional droughts (and wildfires) of 1929-1942 (Zybach 1988; Taylor 1999: personal communication), and the Willamette Valley floods of 1996-1999 (Benner 1998: personal communication; personal observations).

EFFECTS OF WILDLIFE DEMOGRAPHICS

Wildlife have been factors of change in definition and evolution of Soap Creek Valley forests for the past 500 years and for all time that forests have existed in The Valley. “Wildlife” refers to all forms of life that are wild and includes plants, animals, and microorganisms (Hunter 1990). Populations of wildlife, particularly trees and other terrestrial vascular plants, are basic components of horizontal and vertical forest cover patterns. Soap Creek Valley forest cover patterns have been affected by at least four major demographic processes involving local wildlife populations: the introductions and extinctions of wild terrestrial vertebrates, and the introductions and migrations of wild vascular plants. Introduced plants that “go wild” or “become naturalized” are called “wildflowers,” “wildings,” or “weeds,” depending on aesthetic or land management perspectives for definition. Similarly, domestic animals that go wild are called “feral” and introduced undomesticated animals are called “game,” “pests,” or “vermin.”

Animal Extinctions and Extirpations (12,000 BP-1999)

Extirpations are localized extinctions of animals, including those whose presence or absence may directly affect vegetation patterns. Many animals, including elephants, beavers, bears, ungulates, anopheles mosquitoes, and honeybees, are recognized for their capabilities to affect forest cover patterns (Boyd 1986; Crosby 1986; Naiman 1988; Kay 1994). The earliest documentation of vertebrate extinction in Soap Creek Valley is fossilized elephant remains (Fig. 11) described by Glender (1994). Significant archaeological and geological evidence suggests that elephants and other extinct ice age megafauna may have been common in the Willamette Valley 12,000 BP (Cressman 1946; Allen 1984). These findings support the likelihood that such animals were contemporaries of early humans in the region (Hansen 1947), and that extinction may be related to human causes, including hunting (Doughty 1974) and broadcast burning (Kay 1995). This reasoning is supported by physical evidence, including extinct animal fossils in prehistoric cooking fires (Cressman 1946) and existence of larger killing and butchering tools in early prehistoric times than used in later periods (Aikens 1975). The latter factor is supported in Soap Creek Valley by a large obsidian biface discovered over 60 years ago on Forest Peak (see Map 2; Fig. 12) by Hanish (1994). This artifact was dated 3000 to 9000 years of age and presumed made for killing or butchering large mammals (Snyder 1990: personal communication; Zybach et al., 1990).

The journals of Soap Creek Valley explorers and writings of pioneer Willamette Valley residents list several animals that have been extirpated during early settlement and late presettlement time. This list includes grizzly bears

Fig. 11. Glender Brothers' Tampico Spring elephant teeth, c.1919.
Top Photograph. Members of the Glender family posing with OSU historian John Horner along with other OSU dignitaries and two elephant teeth discovered on their Soap Creek Valley farm "in 1919" (possibly c.1926). Photograph and date provided by Eugene Glender; photographer unknown.
Bottom Left. The discovery of the largest tooth created local attention and was profiled in local newspaper articles and Oregon history texts for public grade schools (see Glender 1994). Note reference to Carson DLC (see Map 2; Table D.2). Unidentified news clipping provided by Elvera Glender Muller.
Bottom Right. William Glender and the largest of the two teeth, featured in old newspaper clipping (provided by Eugene Glender; see Zybach 1989).

Fig. 11.

ELEPHANT TEETH FOUND

OREGON ANTIQUITY PROVED BY RECENT DISCOVERY.

Relics of Prehistoric Animals in Soap Creek Valley Thousands of Years Old.

OREGON AGRICULTURAL COLLEGE, Corvallis, July 29.—(Special.)—While cleaning out an artesian spring on their farm, which was formerly the David Carson donation claim in Soap Creek valley, 10 miles north of Corvallis, W. C. and Charles Glender found bedded in wash gravel under three feet of top soil and five feet of blue clay subsoil two large well-preserved teeth.

Dr. John B. Horner, professor of history, with some summer session students, found that the teeth belonged to two elephants. One tooth weighed 15 pounds and the other two pounds. The discovery is also considered another evidence that Oregon is very ancient, since these animals, according to geologists, disappeared from North America many thousand years ago. It was also pointed out that the best preserved elephant and mastodon remains in western Oregon are usually found in the beds of blue clay which are so fine of texture as to be almost impervious to water and air.

Although elephant remains have been discovered in various localities of the Willamette valley, this find is of peculiar interest locally, inasmuch as a special search for elephant bones has been in progress here for five years.

OLD ELEPHANT TOOTH FOUND NEAR CORVALLIS

WILLIAM GLENDER AND TOOTH HE DISCOVERED.

(Douglas 1904), timber wolves (Storm 1941), California condors (Gass 1904; Douglas 1955; see Fig. 13), and whitetail deer (Poesch 1961). It is assumed that most resident fish, bird, and mammal species found in the Willamette Valley were also present in Soap Creek Valley, at least on occasion or seasonal basis, because of the general range and extent of these animals (Storm 1941). Oral history informants list other extirpated species as well, although accuracy of individual observations cannot always be corroborated. Olson, for example, recounts the early 1900s killing of the "last wolf" in Soap Creek Valley, but quickly dismisses the account as a possible "story," or even "ghost story" (Olson 1994). Glender discusses extirpation of cutthroat trout (Glender 1994) and Rohner describes elimination of jackrabbits (Rohner 1993), but it is unknown whether these animals maintained relict populations in the area, were reintroduced within a few months or years, or remain locally extinct.

Methods of corroborating or refuting oral history and journal accounts of wild animals include photographs, scientific reports, and field inventories. A photograph provided by Grabe (see Table 1; Grabe 1990), for example, shows the results of a hunting expedition in Soap Creek Valley during 1899 (Fig. 14) and provides evidence of local bear, skunk, and deer populations. Two wildlife biologists (Sondenaa 1989: personal communication, C. Chambers 1993: personal communication) have examined the photograph and concluded one of the animals may have been a wolverine. If so, it was one of the last wolverines documented in western Oregon (Ingles 1992).

The record of animal extinctions in western Oregon precedes the beginnings of human occupation in Soap Creek Valley by millions of years, as evidenced by widespread occurrence of marine fossils in the area (Orr, et al. 1992). During the past 500 year period this process has apparently been hastened by introduction of guns and steel traps in the Willamette Valley (Fagan 1885; Storm 1941) that followed establishment of Fort Astoria in 1810. Since settlement of Soap Creek Valley in the mid-1840s, extirpations have been further accelerated by human actions, including hunting (Olson 1994), fishing (Glender 1994), trapping (Dickey 1995), habitat alteration (Rohner 1993), introduction of predatory carnivores (e.g., cats, dogs, foxes) (Storm 1941; Olson 1994; Murphy 1995), and game animal stocking (e.g., rainbow trout, bobwhites, and Chinese pheasants) (Storm 1941; Glender 1994; Olson 1994).

Fig. 12. Hanish Forest Peak obsidian biface.
Top Photograph. James Hanish and his mother, Connie, at their Berry Creek home (see Map 2; Hanish 1994) in the mid-1930s, about the same time he discovered the obsidian biface shown in the lower photograph. (Photographer unknown; possibly James' father, Fred Hanish.)
Bottom Photograph. This artifact provides evidence of early human use and occupation of Soap Creek Valley. Discovered in mid-1930s by James Hanish in new logging road cutbank near summit of Forest Peak (see Map 2; table 2), approximately 3 feet below ground surface level (Hanish 1994). The discovery of the biface's existence by OSU researchers in 1990 was partly responsible for special management consideration of Forest Peak area by OSU Research Forests (Zybach et al. 1990; OSU College of Forestry Forest Planning Team 1993), and led directly to the discovery of other ancient artifacts by student employees in the same vicinity during the early 1990s. Photograph by author.

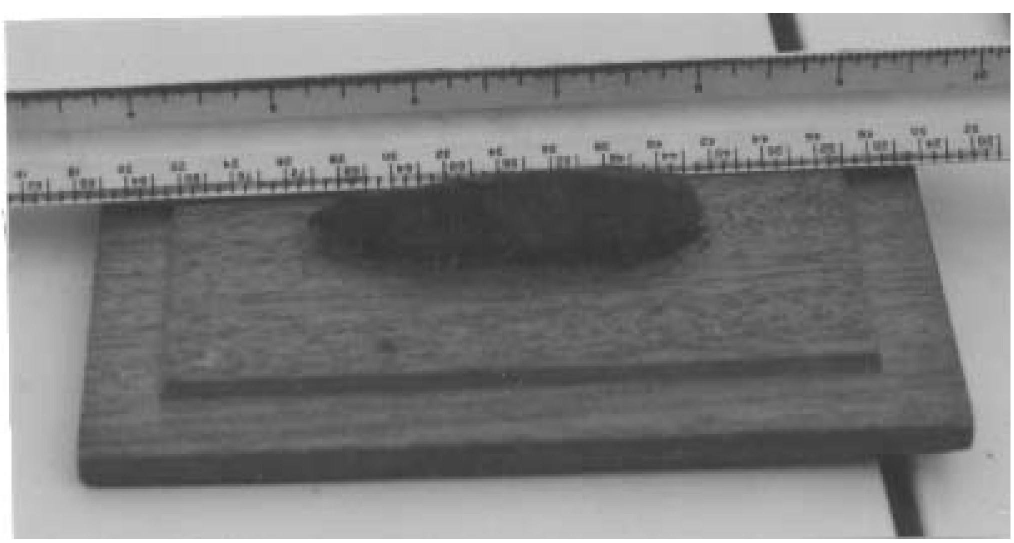


Fig. 13. Lewis sketch of California condor head, 1806. Drawing made from live bird captured near present-day Astoria, Oregon by members of Lewis and Clark expedition (Thwaites 1959). At that time, condors ranged northward into Washington State, east as far as present-day Dalles, Oregon (Gass 1904), throughout the Willamette Valley, and along the Oregon Coast (Davies 1961). Douglas reported condors along the Columbia River and in the Willamette Valley in 1825, and described Hudsons Bay Company (HBC) trappers as prizing condor quills for use as pipe stems (Douglas 1905).

Appendix E lists wild terrestrial vertebrates native to Soap Creek Valley, including those extirpated from northwest Oregon (and thus, Soap Creek Valley) since 1805, the year Lewis and Clark first entered the Pacific Northwest and began making detailed descriptions of local plant and animal species (Thwaites 1959; see Fig. 12). Table 12 provides a summary of Tables E.1 and E.2. Most extirpated vertebrate species were purposely exterminated because of perceived threat to humans, their pets, and/or livestock: e.g., grizzly bears, wolves, wolverines, rattlesnakes, and cougar—which latter species has subsequently returned (see Rowley 1996); were systematically eliminated because of their value for sport, meat, or fur: e.g., beaver, elk, ermine, whitetail deer; or were reintroduced for similar values: e.g., beaver (see Storm 1941; Fig. 15) and elk (Sondenaa 1991; personal observation). Note that exterminated vertebrates are chiefly large carnivores and introduced wild vertebrates are primarily rodents, herptivores, and marsupials.

Fig. 14. Soap Creek Valley wildlife inventory, c.1899. Photograph taken by Sam Moore, early Soap Creek Valley resident (Sondenaa 1991; Zybach 1992b; Zybach 1994). Note variety of people, pets, mammal carcasses and second growth Douglas-fir forest in the background. This area of Soap Creek Valley, including young timber, was described as "prairie" in original 1850s land surveys (Freeman 1852; Hyde 1852a; Hyde 1852b; Ives 1852; Elder 1853). Background ridge is visible to SW (left) of Writsman Hill (see Map 2). Printed by permission of Soap Creek Schoolhouse Foundation (Grabe 1990).

Animal Introductions (1806-1999)

Prior to the arrival of people, new animal species appeared in Soap Creek Valley by migration, expansion of range, or (possibly) by evolutionary development. During historical time, virtually all wild animal introductions have been a direct result of human actions (Glender 1994; Olson 1994; Murphy 1995). The first explorers arrived in 1826 by horseback and established trails subsequently used by cattle drivers and sheep herders in the 1830s (Carey 1971). Settlers in the 1840s and 1850s purposely and inadvertently introduced new species of mice and rats, swine, goats, domesticated fowl, and pet cats and dogs. In the early 1880s, and continuing until the 1990s, fish and game managers

Table 12. Native and exotic wild terrestrial vertebrates, 1805-1999.

Order	Native	Extirpated	Exotic
Frogs	2	0	1
Lizards	3	0	0
Salamanders	5	0	0
Snakes	6	1	0
Toads	1	0	0
Turtles	2	0	1
Carnivores	13	4	1
Deer/Elk	2	1	0
Insectivores	8	0	0
Marsupials	0	0	1
Rabbits/Hares	2	1	1
Rodents	20	0	2
12 Orders	64	7	7

Native	Number of species present in The Valley before 1806 or after 1989
Extirpated	Species present before 1806, but locally extinct more than 10 years.
Exotic	Species introduced to Soap Creek Valley since 1805.

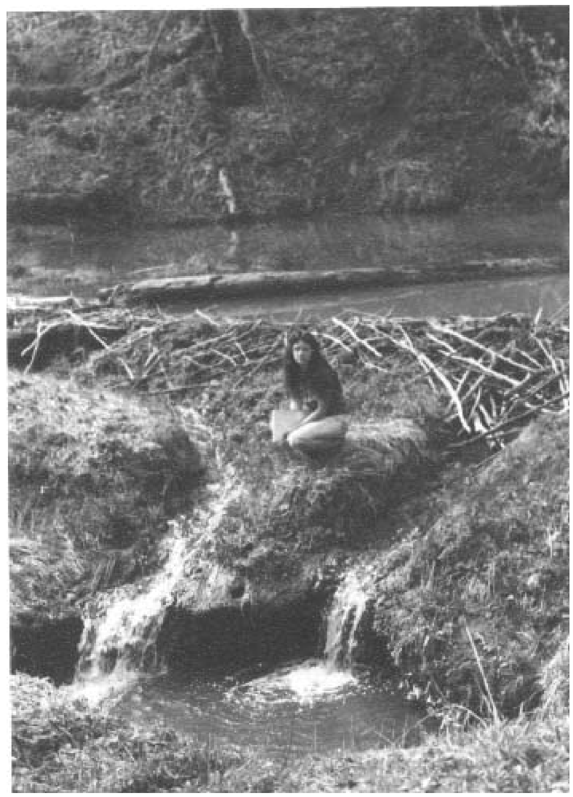
introduced exotic birds, beaver, elk, and trout. Many game animals, including pheasants, turkeys, and cottontails, were introduced by accident, through the proximity of the Oregon State Fish and Wildlife Department's E. E. Wilson Game Ranch, across Highway 99 W. from Coffin Butte (Webber 1996: personal communication).

Today, many Soap Creek Valley residents keep a variety of pets, which include dogs, cats, birds, fish, horses, reptiles, amphibians and insects (Miller 1996: personal communication). In instances of introduced game animals, local populations are usually encouraged to become naturalized; in other instances, domestic pets and livestock have gone "wild" on their own accord. There is at least one documented example of OSC researchers establishing a population of beaver, which had been previously extirpated by trappers (Storm 1941; Glender 1994; Olson 1994). Experimental fish ponds in central Soap Creek Valley (see Map 2; Table 2) hold populations of exotic warm water fish, also established by OSU research (Zybach et al., 1990). In these ways, goats were introduced, became feral, and were then extirpated from Soap Creek Valley forestlands (Jackson 1980; Rowley 1990: personal communication; Rowley 1996), possum populations became established and have increased in numbers (Sondenaa 1991), turkeys (Stouder 1995), Chinese and elk (Sondenaa 1991) have been stocked and hunted in season, and planted rainbow trout, more aggressive in their feeding habits than their native cousins, are thought to have replaced cutthroat trout in most Soap Creek Valley creeks (Glender 1994).

It is difficult to determine if some species are native or naturalized. For example, Lewis and Clark reported red fox in western Oregon in 1805 (Thwaites 1959). Douglas reported that red fox were not found in western Oregon in the 1820s, although a close relative, the tree-climbing gray fox, was common (Douglas 1905). Douglas is supported by Glender (1994), who trapped several gray foxes in the 1930s and a single red fox "with a collar on it," indicating that it was an escaped pet. Glender's account is supported by Murphy (1995), who blamed the demise of local grouse populations on introduction of red foxes by local hunters in the early 1900s. Storm (1941) disagrees, stating the red fox was native, "though quite uncommon," and blames reduced "sooty" grouse numbers on hunting. Ingles (1992), however, supports both accounts, claiming red fox native to the high Cascades of Oregon and Washington, but introduced "from the southern United States" to many counties in northwest Oregon (including, presumably, Benton County and Soap Creek Valley). A few other animals, including fish and birds, and many vascular plant species, chiefly grasses, have a similarly confused ancestry in Soap Creek Valley.

Summary. Since 1825, introduced domestic, sport, and feral animals have had a direct effect on local forest cover patterns by displacing (and/or restricting the range of) native species (Storm 1941; Kay 1996). Table 12 summarizes some basic demographic patterns related to wild vertebrate species' numbers, locations, and associations. As shown in Table 12, since settlement of Soap Creek Valley, the number of introduced species has been roughly equal to the number of extirpated species. Reintroductions of animals have been limited generally to species with perceived sport or fur value; although cougar, and possibly some elk and/or beaver, have returned on their own accord ("reintroduction," in this latter sense, is interpereted as "allowed to return"). Populations of individual species have varied dramatically over time, as in instances of irruptions, killing snows, trapping projects, or disease epidemics.

Fig. 15. Baker Creek beaver ponds, 1990. OSU Wildlife biologist, Angela Sondenaa (see table 5) provides human scale to beaver pond-building on OSU Research Forests' Baker Creek property (see Maps 2 and 3; Tables 2 and D.4) Note logs and beaverslide on far bank. Photograph by author.



Plant Introductions (1826-1999)

In common with wild vertebrates, most introductions of wild Soap Creek Valley vascular plant species are the result of human actions, both purposeful and accidental. Purposeful introductions include annual plantations of agricultural crops (Rohner 1993; Murphy 1995), and perennial plantations of fruit and nut orchards (Glender 1994; Olson 1994; Cook 1995; Murphy 1995), chittum (Olson 1994), ash (Garver 1996: personal communication), and conifers (Starker 1984; Wakefield 1989: personal communication; Rowley 1996). Accidental, or unplanned, introductions include weeds and wildings: e.g., bachelor buttons (Rohner 1993), hairy vetch (Glender 1994), orchardgrass (Murphy 1990) and Hardinggrass (Rohner 1993), herb Robert (Hays 1990: personal communication), dandelions, and scotchbroom (Grabe 1990).

In addition to plantations, introduced tree species include wilding fruit trees (Rohner 1993; Glender 1994), principally pears, plums, cherries, and apples (see Fig. 16); wilding landscape trees, including English holly and silver maple (Zybach et al., 1990); and naturalized progeny of off-site conifers, chittum, and pine plantations (Rowley 1996). Most fruit and landscape tree wildings located in Soap Creek Valley occur adjacent to roads and fields, fencelines, creeks, old orchards, and abandoned homesites (Gu 1991: personal communication), although scattered specimens are found occasionally in openings throughout forested areas (personal observation).

Table 13 summarizes the types and numbers of species of wild vascular plants identified in Soap Creek Valley since 1826. Douglas (1905) encountered many species and specimens that had existed for decades or centuries, as evidenced by tree ring counts (Starker 1939; Rowley 1996) and surveyed 1850s "Bearing Tree" (BT) diameters (see Appendix F). Exotic grasses, orchards, annual crops and conifer plantations have resulted in changes in horizontal and vertical landscape in Soap Creek Valley vascular plant cover patterns since settlement. Exotic plants are predominantly grasses and forbs, existing as weeds in cultivated areas and understory vegetation in forested areas (Johnson 1996: personal communication). As shown by Table 13 totals, species "richness," a measure of wildlife diversity that simply totals the number of different species within an area (Kimmins 1987), has increased dramatically for wild Soap Creek Valley vascular plants in the past 170 years. (Another significant measure of plant diversity, species "importance" (Kimmins 1987), is discussed in Chapter V.)

Plant Migrations (1500-1999)

Vascular plant species have moved into Soap Creek Valley, and from place to place within its boundaries, through plantings and seeding by people and by natural seeding and sprouting processes that precede human history. Two major results of Soap Creek Valley plant migrations during the past 500 years have been the afforestation of oak savannah and grassy prairies (see Fig. 17) during the past 170 years and the expansion of Douglas-fir populations and range during the past 350 years. These processes have resulted in a general shift in species importance

Fig. 16. Pioneer apple trees, 1947-1999.
Top Photograph. Robert Wilson apple tree blossoms. This photograph was taken in 1947 by OSC student, Robert Wilson. The photograph was made available to OSU student researchers in 1990, who subsequently named the tree in honor of the photographer (Zybach et al., 1990). Ten, or more, pioneer orchards still exist in Soap Creek Valley, many still producing fruit or nuts 100 to 150 years after their establishment. Hundreds of wilding cherry, apple, pear, walnut, and plum trees in The Valley may be descended from these pioneer plantings (Compton 1990: personal communication; Gu 1991: personal communication).
Bottom Photograph. Letitia Carson pioneer apple tree, June 12, 1999. This tree was named in honor of a pioneer black resident, who lived in the area of this tree in the 1840s and 1850s, and may have even planted it (Cook 1995). The name was given by student researchers completing a cultural resources inventory of OSU properties in Soap Creek Valley (Zybach et al., 1990). Photograph by author.

Fig. 16

Table 13. Native and exotic wild vascular plants, 1500-1999.

Wild Plant Types	Native	Exotic	Total	% Native
Ferns & Graminoids	009	000	009	100
Grasses	026	035	061	43
Herbs	225*	082	307	73
Rushes and Sedges	022	000	022	100
Shrubs and Vines	031	004	035	89
Trees	027	018	045	60
TOTAL	340	139	478	71

*Only two wild vascular plants have been identified as possibly being extirpated from Soap Creek Valley since 1845: two small populations of grass lilies (Sisyrinchium douglasii), believed to have existed near Lewisburg Saddle and Coffin Butte shortly after 1900 (Murphy 1995), and a population of "big white" moccasin flowers (probably mountain ladyslippers, Cypripedium montanum) near Sulphur Springs in the mid-1900s (Murphy 1995). Both species were considered very rare at the time, and neither species is known to exist in the area at this time.

Native plants are those species known, or believed, to have lived in the immediate vicinity of Soap Creek Valley sometime after 1500 and prior to 1826.

Exotic wild plants are believed to have been introduced into Soap Creek Valley after 1825 or, more likely, after 1845.

% Native equals the percentage of total number of native wild plant species found in Soap Creek Valley in 1845 divided by the total native and exotic wild plants existing in Soap Creek Valley today.

(Kimmins 1987) in Soap Creek Valley from a pattern of oak and bunchgrass savannah to one of Douglas-fir and fern forest.

Afforestation of prairies and savannah (1830-1999). Afforestation is the process by which previously unforested areas, such as meadows, beaver ponds, or prairies, become filled with forest trees. The documented afforestation of Soap Creek Valley wetlands, meadows, and prairies by conifer and hardwood trees has been an on-going process for at least 170 years; one that can be explained by a chronological series of events and circumstances:

1) The reduction of Willamette Valley human populations by disease in the early 1830s directly resulted in reduction of local fire use (Boyd 1986). Soap Creek Valley areas of marshy wetland, grassy prairie and oak savannah required periodic fires for their maintenance. The reduction and eventual elimination of regular broadcast burning practices that had killed seeds and seedlings of

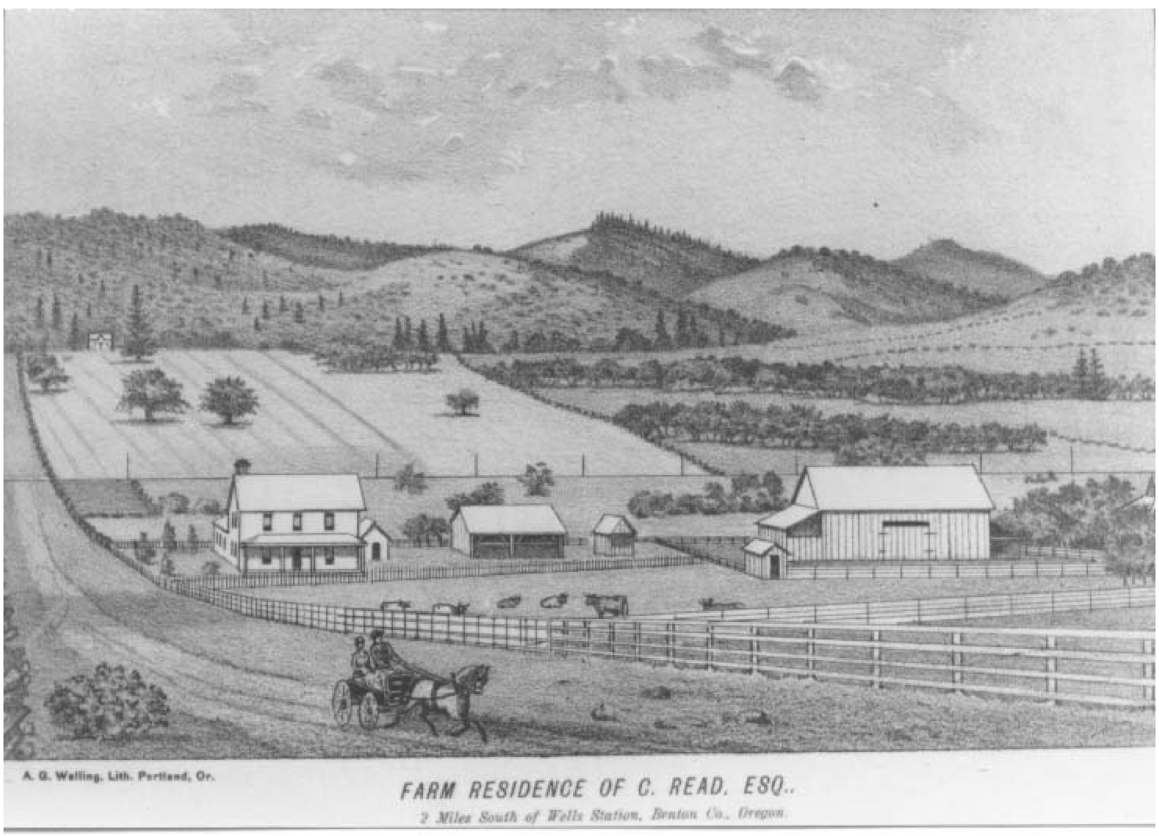
scattered trees and stands of trees in The Valley, resulted in successful encroachment of ash, oak, Douglas-fir, and grand fir stands in areas formerly dominated by grassy openings (Fig. 17; Thilenius 1964; 1968; Rohner 1993; Olson 1994).

2) Livestock populations introduced by white settlers in the mid-1840s converted remaining Soap Creek Valley grasslands to pasturage by grazing and trampling native plants, including young tree seedlings (Longwood 1940; Crosby 1986). Flatter prairie lands that went ungrazed were mowed for hay to feed livestock in winter (Fig. 18). Catastrophic snowstorms (see Table 11) in 1861-62 (Oliphant 1932), 1881-82 (Oliphant 1932; Nettleton 1956; Jackson 1980; Starker 1984; Dickey 1995), and 1937 (Rohner 1993; Dickey 1995) killed large numbers of local livestock, particularly sheep and cattle, allowing trees to become established in areas of reduced grazing and mowing (Lord 1939; Sprague and Hansen 1947).

3) The introduction of tractors and automobiles to Soap Creek Valley in the early 1900s resulted in a decreased need for livestock for transportation and farming, which resulted in decreased grazing and mowing for hay (Glender 1994; Murphy 1995). Reductions in livestock resulting from technological changes had the same effect as large scale livestock die-offs caused by snowstorms, and increase in afforestation of prairie soils along margins of established stands of trees.

4) Establishment of the Oregon State Tree Nursery in the 1920s (McDaniel 1931; Nettleton 1956) and a CCC camp in the 1930s (Thomas 1980; Zybach c.1991) adjacent to Soap Creek Valley (Sekermestrovich 1991) resulted in the first forest plantations (predominantly Douglas-fir) in The Valley (Fig. 19). Removal of remaining domestic grazing animals at the beginning of WW II (Rohner 1993) and increased value of conifer timber following the war, resulted in planting of remaining Soap Creek Valley prairie lands with Douglas-fir and other conifer seedlings in the 1950s that has continued to the present time (Blanchard 1995: personal communication; Garver 1996: personal communication; Rowley 1996; Davies 1997; personal observation).

Fig. 17. Drawing of oak afforestation from NE viewpoint, 1885. Several named landmarks are visible from this perspective of Soap Creek Valley. The view is westward from the approximate location of present-day Adair Village (see map 2) toward Peavy Arboretum and the ridgelines of northern Soap Creek Valley. Identifiable features include Glenders Hill, Tampico Ridge, Forest Peak, and Writsman Hill (see map 2 and Table 2). This is one of a number of local landscape drawings by James T. Pickett (Munford 1988) that illustrate an 1885 history of Benton County (Fagan 1885). Pickett was noted for the detailed accuracy of his drawings, which can be favorably compared to original land surveys, timber cruises, landscape photographs, and aerial photographs. Note relict grasslands on southern slopes of Soap Creek Valley, many of which persist to this time (Zybach, Sherer, and Sondenaa 1990), and scattered conifers rising above dense oak woodlands on remaining slopes. Original land surveys in this area depicted open grasslands and scattered oaks and "oak openings" less than 35 years before drawing was made (see Chapter V). Thilenius (1968) traces general Willamette Valley oak woodland development to 1862, but relates forestation process only to cessation of Indian burning and doesn't factor in potential effects of livestock-killing snows, floods, and freezes of 1861-1862 (Tables 10 and 11). Using Thilenius' figures, the oak canopy in this drawing would be less than 25-years old.



Expansion of Douglas-fir Range (1650-1999). Old-growth Douglas-fir dating to the mid-17th century, many specimens of which still exist in Soap Creek Valley, likely helped to reforest and afforest adjacent burns, prairie and meadow areas, as described in preceding paragraphs. At the time of decimation of local Kalapuyan families in the 1830s, several stands of Douglas-fir existed in Soap Creek Valley that were less than 150 years of age (Nettleton 1956; Johnson 1996: personal communication), the likely progeny of older trees within their perimeters, or immediately adjacent to them (Lord 1939; Isaac 1949).

Oak woodlands that afforested Soap Creek Valley savannah and prairies following settlement in the 1840s (Storm 1941; Franklin & Hemstrom 1981; Olson 1994; see Fig. 17) have also been replaced by conifers—in most instances, Douglas-fir (Olson 1994; personal observation). This process has been described by Rohner (1993), Olson (1994), and Rowley (1996) and documented by drawings, photographs, maps, and scientific research (Sprague & Hansen 1947; Thilenius 1964; 1968; Towle 1974; 1982).

Three basic methods by which the succession of grassland to oak woodland to conifer forest in Soap Creek Valley occurred have been described:

1) Oak woodlands afforested several predominantly east- and south-facing prairies and pastures that had been too hot and/or dry for conifer establishment (Fig. 17). The oak overstory subsequently provided sufficient shade and moisture for conifer seedlings to survive (Sprague & Hansen 1947; Olson 1994). Young conifers eventually outgrew the oak overstory and, in turn, began to shade the parenting oak out of existence (Sprague & Hansen 1947; Wakefield 1984: personal communication; personal observation). This ultimately established a nearly pure stand of Douglas-fir. This process, if left unchecked, can take a few decades to a century or more to complete. It continues to the present time in many areas of Soap Creek Valley (Fig. 20).

2) Oak woodlands were purposefully "slashed" (Olson 1994; Cook 1995) and "grubbed" (Rohner 1993) for pasturage (Fig. 21). Slashing and grubbing refer to practices of clearcutting and/or uprooting stands of oak trees in order to create pasture or cropland. After being used for ranching and/or farming purposes, these lands seeded or were planted to conifer (Figs. 19 and 21; Olson

Fig. 18. Mowed Soap Creek Valley prairie, c.1899. Soap Creek Valley meadows and grassy prairies that were not grazed during summer months were often mowed and stored for feeding livestock during Fall and Winter. Note size of trees encroaching on prairie boundaries, along wooden fenceline. Photograph by Samuel Moore, provided by Soap Creek Schoolhouse Foundation, courtesy Myra Moore Lauridson (Grabe 1990).

Fig. 19. McDonald Forest 1936 Douglas-fir plantation, c.1950. This photograph documents one of the first conifer plantations to be established by OSU students in Soap Creek Valley (Rowley 1981). These trees are the result of student and CCC tree planting projects in an area that had been logged in the late 1920s (Hindes 1996) and burned in the early 1930s (Sekermestrovich 1990; Rowley 1996). OSU College of Forestry, photographer unknown.

Fig. 18

Fig. 19.

1994; Garver 1996: personal communication; Rowley 1996), predominantly Douglas-fir (Munger 1940).

3) Oak woodlands were directly converted to conifer stands by "release cuttings" (Garver 1996: personal communication; Rowley 1996), and by "conversion" reforestation projects (Zybach 1983; Blanchard 1995: personal communication; Garver 1996: personal communication). Release cuttings are the removal of unwanted overstory trees and other competing vegetation by mechanical means, including cutting with chain saws or machetes. This method of conversion depends upon an existing population of desired trees, such as an understory of redcedar, grand fir, and/or Douglas-fir that is being shaded or crowded by unwanted deciduous trees, such as oak, bigleaf maple, or alder (Fig. 22). Unwanted overstory trees and competing vegetation can also be controlled or killed with chemical applications (Rowley 1996: personal communication). Conversion reforestation projects are planned actions that result in removal of undesired tree and/or brush species and subsequent establishment of preferred tree species (Zybach 1983). Examples of conversion reforestation projects include changing oak woodlands to Douglas-fir plantations (Fig. 21), or converting mixed alder, bigleaf maple, and grand fir stands to a mixed Douglas-fir, grand fir, and redcedar plantation.

Summary. The expansion of Douglas-fir into the grassy prairies and oak savannah of Soap Creek Valley has been the most widespread change in horizontal and vertical forest tree cover patterns to occur during historical time (see Figs. 17, 19, 20, 21, and 22). This change is a result of seeding made possible by historical reductions in prescribed burning practices and livestock grazing, and by purposeful afforestation and conversion reforestation projects. Other Soap Creek Valley plant migrations, including the expansion of oak woodlands into former prairie lands and meadows (Figs. 17 and 20) and movement of understory plants and weeds (Rowley 1990: personal communication; Johnson 1996: personal communication), have been either relatively ephemeral phenomena (as in the instance of oak migration, see Fig. 20), or of incidental importance to horizontal and vertical forest cover patterns (e.g., wilding fruit trees: see Fig. 16) when compared to the effects of Douglas-fir migration patterns and consequences.

Fig. 20. Smith Peak oak and Douglas-fir succession, 1938-1990.
Left Photograph. Maxine Dickey and oak woodlands approximately one mile north of Smith Peak, on southern banks of Berry Creek, c.1938 (see Map 2). New Berry Creek School teacher, Maxine Van Patten, had her photograph taken near this stand of "grub" oak by a student, Edith Tandy (Dickey 1995; Vanderburg 1995). Van Patten later married local OSC Fisheries and Wildlife student, Donald Dickey. Oak stand is typical of woodlands that afforested Soap Creek Valley area following settlement in 1846. Note vertical structure that features close spacing between trees and lack of lower, spreading limbs that typified savannah oak of presettlement era.
Right Photograph. This photograph, taken eastward from Tampico Road near the summit of Smith Peak (see Map 2) in 1990, illustrates the succession from savannah oak woodland to Douglas-fir forest that has taken place during the 20th century in much of Soap Creek Valley. Note the dramatic change in vertical structure from widespread oak limbs in open, grassy prairie to closely grown conifers that have matured in shady environment. Also note the apparent even-aged nature of the oak and Douglas-fir tree canopies in these photographs. Photograph by author.

Fig. 21. Lewisburg Saddle view NE., Soap Creek Valley, 1914-1989.
Top Photograph. Taken by Ernest Cook in 1914, looking eastward over his property (Cook 1995: Zybach 1994b). The Cook farmhouse and outbuildings are in right foreground, Writsman Hill (see Map 2) in center background. Note pre-1914 clearcut to the east, in area that is now a portion of McDonald Forest (see Map 4; Fig 19), and the relative size and spacing of slashed tree stumps in foreground area cleared for pasturage (Olson 1994).
Bottom Photograph. Taken from a location slightly uphill from Cook's 1914 perspective (Zybach 1989; Zybach 1994b). Writsman Hill is in the left-center background and Coffin Butte is clearly visible to the northeast (see Map 2). Note great amount of conifer afforestation and reforestation that has taken place in Soap Creek Valley during the 20th century. Also note increase in deciduous tree growth that has taken place along Soap Creek (center, valley floor) in 75 years time between photographs. Relict prairie lands visible on the southern slopes of Writsman Hill and Forest Peak can be more clearly viewed in the bottom photograph of Fig. 16, taken ten years later than this photograph. (Photograph by author.)

Fig. 21.

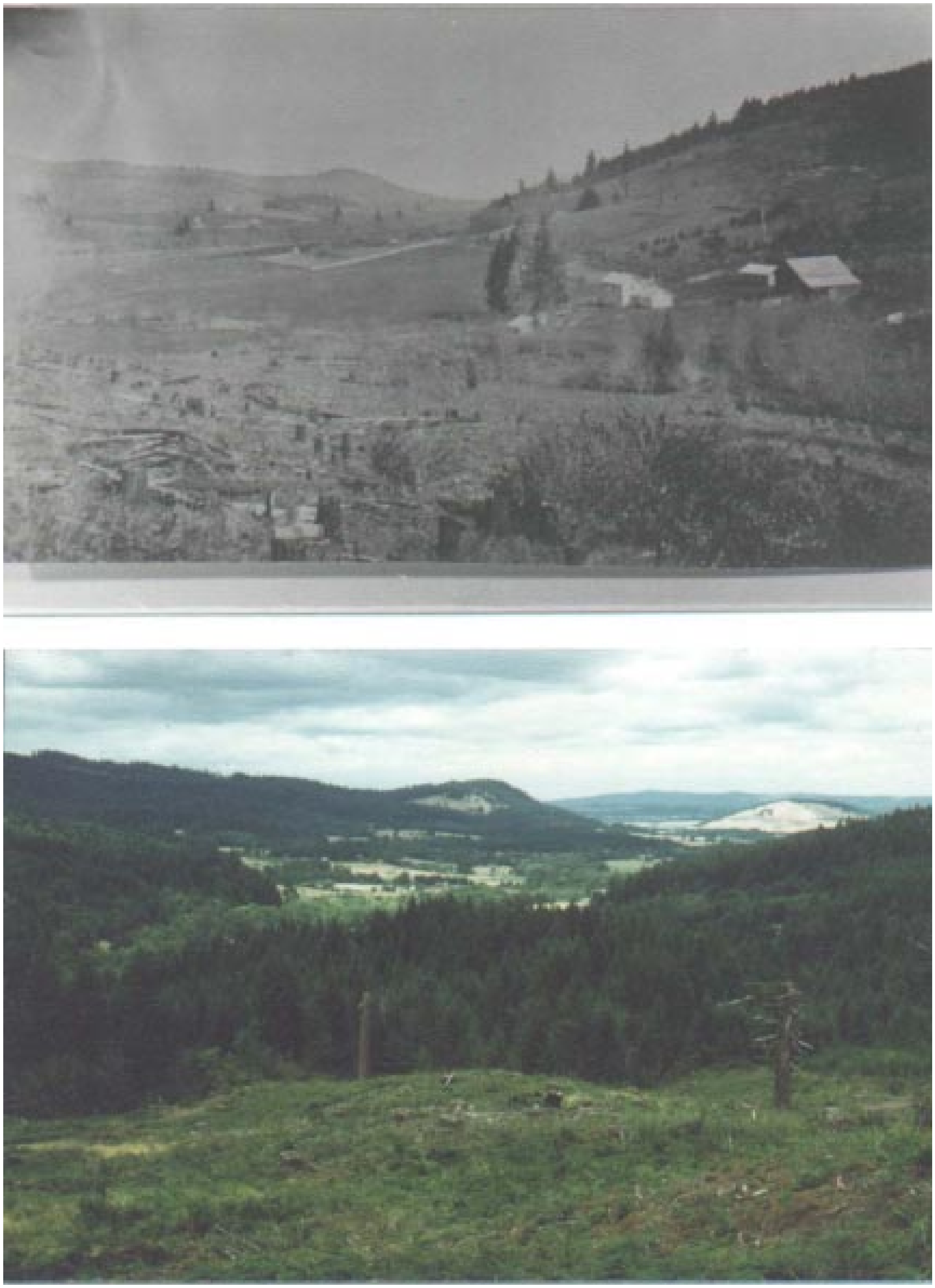


Fig. 22. Writsman Hill Douglas-fir stand, June 12, 1999. Nearly pure stand of Douglas-fir on the northern aspect of Writsman Hill (see Map 2) is a partial result of “stand release” reforestation methods used by OSU Research Forests foresters in the 1980s (Garver 1996: personal communication). This location, also known as “Steele Hill” (Metsker 1929b), was a source of Christmas Trees by the Rohner family in the 1930s (Rohner 1994), and was a grassy prairie in the 1850s. Note recent home construction at the base of the hill. (Photograph by author.)

Discussion. Soap Creek Valley became one of the earliest forested areas in western Oregon to convert from “natural” and/or “leave-tree” seeding to hand planting of conifer seedlings for reforestation and afforestation projects. This was partly due to a series of related circumstances, including the proximity of the OAC School of Forestry in 1910 (Jackson 1980), the development of the Oregon State Nursery in the 1920s and 1930s (McDaniels 1931), the beginning of OSU Research Forests lands purchases in Soap Creek Valley during 1926 (Metsker 1929b; Starker 1984; Jackson 1980), and the ready availability of CCC and NYA labor for road building, tree planting, and fire fighting projects in the 1930s (Berg 1983; Sekermestrovich 1990; Zybach c.1991). Another result of this coincidence is that

OSU and private forestlands in Soap Creek Valley (see Map 3) now contain some of the most intensely managed and measured conifers in western Oregon. For the past 70 years, management focus has been upon the growth and harvest of commercial logs and the successful afforestation of balds and other grassland (Wakefield 1984: personal communication; Garver 1990: personal communication; Davies 1997). OSU research studies have focused on recreational hunting, hardwood management, recreational planning, etc., in Soap Creek Valley from time to time, but the current conifer pattern is clearly intended to achieve an optimum commercial level of timber production (Jackson 1980; Wakefield 1984: personal communication; Starker 1984; Dunn 1990; Garver 1996: personal communication; Rowley 1996; Davies 1997; personal observations). In recent years, this management approach has resulted in public discussion and controversy (Grabe 1990; Anderson 1993; OSU College of Forestry Planning Team 1993).

Summary. Despite a measurable decrease in “wildland” (uncultivated) acreage, and the simultaneous expansion of even-aged stands of seeded and planted Douglas-fir trees (see Figs. 14, 19, 20, 21, and 22), “biodiversity richness” of wild vascular plant and wild terrrestrial vertebrate species in Soap Creek Valley has generally increased during the past 175 years (see Map 3; Appendix E; Figs. 5, 6, 14, 15, and 17; Tables 12 and 13). “Evenness” (or “species importance”) of wildlife species’ distribution has varied as a result, as might be expected. For example, wild rodent populations tend to congregate near human developments and habitations, while large wild carnivore populations tend toward the deeper, protected recesses of forests.

In particular, since settlement:

1) The greatest loss of Soap Creek Valley wildlife habitat has been the thousands of acres of oak savannah, grass prairies, wetlands, meadows, and berry patches maintained by local Kalapuyan broadcast burning practices until the mid-1800s.

2) The greatest increase in local wildlife habitat has been the expansion of thousands of acres of even-aged stands of Douglas-fir trees (mostly through seeding before 1930, and through plantations since then).

3) Total local wildland acreage has decreased significantly, with relatively large areas now devoted to housing, automobile traffic, solid waste disposal, and raising domestic animals, crops, and landscape plants (this effect has particularly restricted the range and potential population of many wild plants and animals).

4) Wild vascular plant species diversity has increased dramatically, largely through introductions of exotic grasses, herbs, shrubs, and trees.

5) Wild terrestrial vertebrate species diversity has remained about the same. Large, wild carnivore populations were largely exterminated, with grizzly bears, timber wolves, lynx, and wolverines remaining locally extinct to this time. Although not the focus of specific extermination projects, other vertebrates, including California condors, western rattlesnakes, and whitetail deer, have also been extirpated through human actions and remain locally extinct. Numbers of introduced vertebrate species, including house mice, bullfrogs, possums, nutria, Chinese pheasants, turkeys, and turtles, approximately equal the number of species extirpated during the same time period.

EFFECTS OF HUMAN ACTIVITIES

The history of people in Soap Creek Valley probably exceeds 10,000 years; and is perhaps much longer. The incremental and cumulative effects of human history, much like that of the ice age Bretz Floods, has likely had a long-term and identifiable impact on local wild vascular plant and vertebrate animal populations. This section examines the relationship between human history in Soap Creek Valley and changes in The Valley's forest cover patterns.

At occasional intervals, discussion and summary statements are included in the text of this section in particular reference to the following questions: Were human influences on Soap Creek Valley forest cover patterns, particularly those within the prehistoric 1500-1825 range of this study, incidental or pervasive? How do they compare to other types of influences, particularly the catastrophic events and demographic processes listed in Tables 8 and 9? Do human actions tend to exacerbate or mitigate "natural" (non-human) processes and events that affect forest cover patterns? These questions are addressed more explicitly in Chapter IV, placed into chronological context in Chapter V, and answered, based on the "weight of evidence," in Chapter VI.

Broadcast Burning (1500-1999)

Kalapuyan families in the Soap Creek Valley area used fire for vegetation management purposes in early historical times. This practice has been termed "pyroculture" (Gilsen 1989), and involved periodic use of broadcast burning over large areas of the landscape to control unwanted plants, including Douglas-fir and possibly poisonoak, to the advantage of desired plants, including oak, camas, filberts, blackberries, tarweed, strawberries, nettles, brackenferns, arrowwood, and huckleberries (Minore 1972; Boyd 1986; Gilsen 1989). The widespread use of this practice is evidenced by persistent patterns and species of plants that exist to this time (see Table 13) and by thousands of prehistoric artifacts in Soap Creek Valley and adjacent areas used to process food, medicine, dyes, construction materials, tools, and other vegetable products (Fig. 23). Other uses of broadcast burning include hunting, curing of tarweed seeds prior to harvest, increased ease of nut gathering (acorns and filberts), and creation of useful woody sprouts (including hazelnut and arrowwood) for manufacturing arrows, baskets, huts, and other purposes (Boyd 1986; Gilsen 1989). According to Santiam Kalapuyan (see Map 10), Joseph Hudson (born "Pa-pe-a"; see Appendix H), burning was done for other reasons as well (Jacobs (1945):

> When it was summertime they burned over the land, when they wanted to eat grasshoppers. When they burned the land, then they burned the grasshoppers (too). And then they (women) gathered up the grasshoppers, and they ate those grasshoppers it is said. I do not know what they did to them, when they wanted to eat them. Maybe they cooked them, and on the other hand perhaps they did not cook them. I never saw them eat them. Those people long ago only spoke of it.

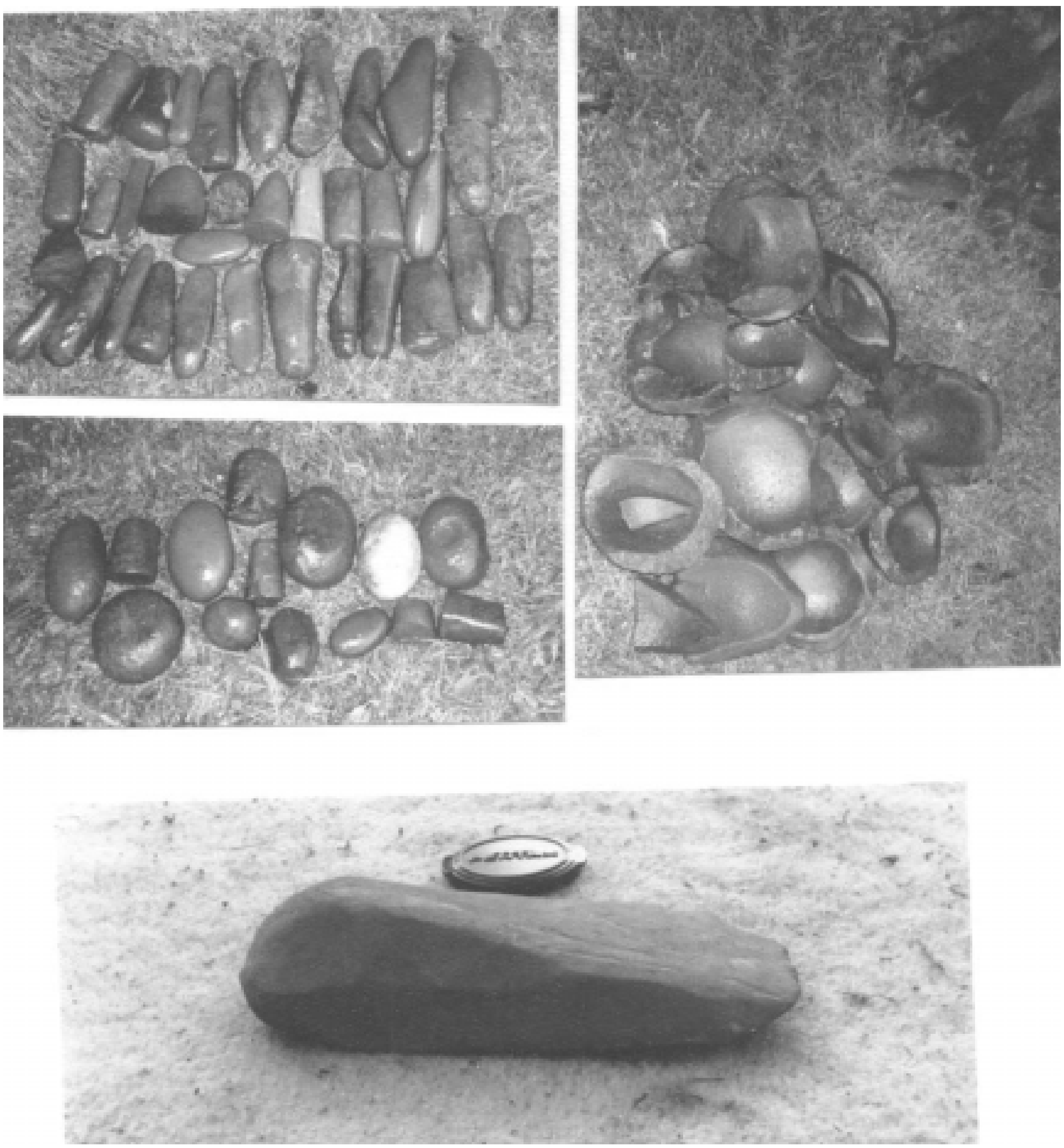
Lucy Thompson (named Che-na-wah Weitch-ah-wah at her birth in the 1850s to a northern California Yurok family of recognized oral traditionalists) described prehistoric use of fire for weeding purposes in the Douglas-fir Region (Thompson 1991):

> All the oak timber was owned by the well-to-do families and was divided off by lines and boundaries as carefully as the whites have got it surveyed today. It can easily be seen by this that the Indians have carefully preserved the oak timber and have never at any time destroyed it.
>
> The Douglas fir timber they say has always encroached on the open prairies and crowded out the other timber; therefore they have continuously burned it and have done all they could to keep it from covering all the open lands.

The decimation of western Oregon Indian populations by disease in the early 1830s resulted in less broadcast burning. Two primary reasons for the reduction were: 1) fewer people to continue burning the hundreds of thousands of acres of prairies and savannah established and maintained by previous, more populous, generations, and 2) reduced need to produce or harvest the relatively vast amounts of food and other products needed and used by the earlier, much larger, populations.

The advent of settlement and subsequent conversion of Soap Creek Valley lands to livestock pasturage in the mid-1840s put an end to Indian burning practices. Broadcast burning continued to be used as a tool by pioneer landowners and their geographic descendants for clearing fields (Hanish 1994; Olson 1994) or logging sites of slash and other flammable debris (Thomas & Schroeder 1936; Longwood 1940; Vanderburg 1995). In the mid-1900s, field burning frequency increased as commercial grass seed growers began to use annual fire to help control weeds and pests, clear out rank growth, and favor select seed crops (Rohner 1993). These practices, and their purposes, were very similar to those used by Kalapuyan resource managers over 100 years earlier. Annual field burning practices have continued in Soap Creek Valley to the mid-1990s, but public sentiment against smoke in the Willamette Valley has served to greatly reduce broadcast burning through most of Benton County, including Soap Creek Valley, during the past five years (Rowley 1998: Personal communication; personal observations).

Fig. 23. Soap Creek area prehistoric vegetation processing tools. These mortars and pestles are among hundreds of artifacts found by Soap Creek area farmers since settlement (Smith 1992: personal communication; Rohner 1993; Hanish 1994; Dickey 1995). The stone wedge may have split timbers for construction and/or large logs for firewood. Grinding tools were probably used to process camas, tarweed seeds, blackberries, filberts and/or acorns that grew throughout the Soap Creek Valley area (Collins 1951; Aikens 1975; Boyd 1986; Gilsen 1989). Pat Smith collection. Photographs by Terri Trosper and Barbara Elliott (1992) and Kevin Sherer (1990: wedge).



Farming and Ranching (1846-1999)

Beginning in 1846, the first European American settlers in Soap Creek Valley (see Maps 2, 4, and 11; Table D.2) introduced agricultural practices that included livestock grazing (see Fig. 24; Olson 1994), fruit orchard planting (Cook 1995; Vanderburg 1995), and fencing and plowing, in preparation for sowing market products; chiefly wheat and oats (Fagan 1885; Longwood 1940; Rohner 1993; Cook 1995; Murphy 1995). Much local effort was directed initially toward the raising of livestock for gold miners in California, southern Oregon, and Idaho (Longwood 1940; Jackson 1980; Zybach & Meranda 1989). As mine field productivity waned through time, and railroads made transcontinental trade of farm products possible, Soap Creek Valley farmers began concentrating on other produce, including milk, eggs, prunes, and nuts (Longwood 1940; Rohner 1993; Murphy 1995). In the late 1800s, many local soils became unsuited for wheat production because of "soil depletion" (Longwood 1940; Cook 1995; Murphy 1995). The introduction of internal combustion engines in the early 1900s (see Fig. 25) and increased local knowledge allowed for "deep plowing" and crop rotation practices to rejuvenate depleted soils (Glender 1994; Cook 1995; Murphy 1995). The contemporaneous emigration of European (chiefly German, Italian, Norwegian, Russian, Swedish, and Swiss) families to Soap Creek Valley (Glender 1994) coincided with regional trends to smaller farms and more diversified crops (Longwood 1940; Rohner 1993; Glender 1994) made possible by technological change. By WW I, increased diversity of Soap Creek Valley crops and cultures likely helped local families respond to vastly changed international conditions, including widespread use of telephones, radios, railroads and automobiles (Olson 1994). As a partial result, local farmers were able to produce crops demanded during time of the war, including navy beans, feed corn, and poultry (Longwood 1940; Rohner 1993; Olson 1994; Cook 1995).

The early 1920s were generally viewed as a time of prosperity, and many farmers in the Soap Creek Valley area owned telephones, automobiles and tractors (Glender 1994). Modern farming practices, implemented on an experimental basis in the early 1900s, had been adopted by most families (Cook 1995). Some of the first row crops in the grass seed industry were planted along the banks of Soap Creek, to the northwest of Coffin Butte, shortly after WW I. Income from commercial harvests of Hardinggrass was good enough at that time for

Map 11. US GLO/PLS cadastral map, T. 10 S., R. 5 W., 1854 (Hathorn 1854b). Provisional and DLC pioneers focused initial land claims in Soap Creek Valley on tillable soils deposited by Bretz Flood events over 12,000 years before their arrival (see Maps 2 and 5; Table D.2). For consolidation and subdivision of pioneer claims, see Rohner (1993) and Cook (1995).

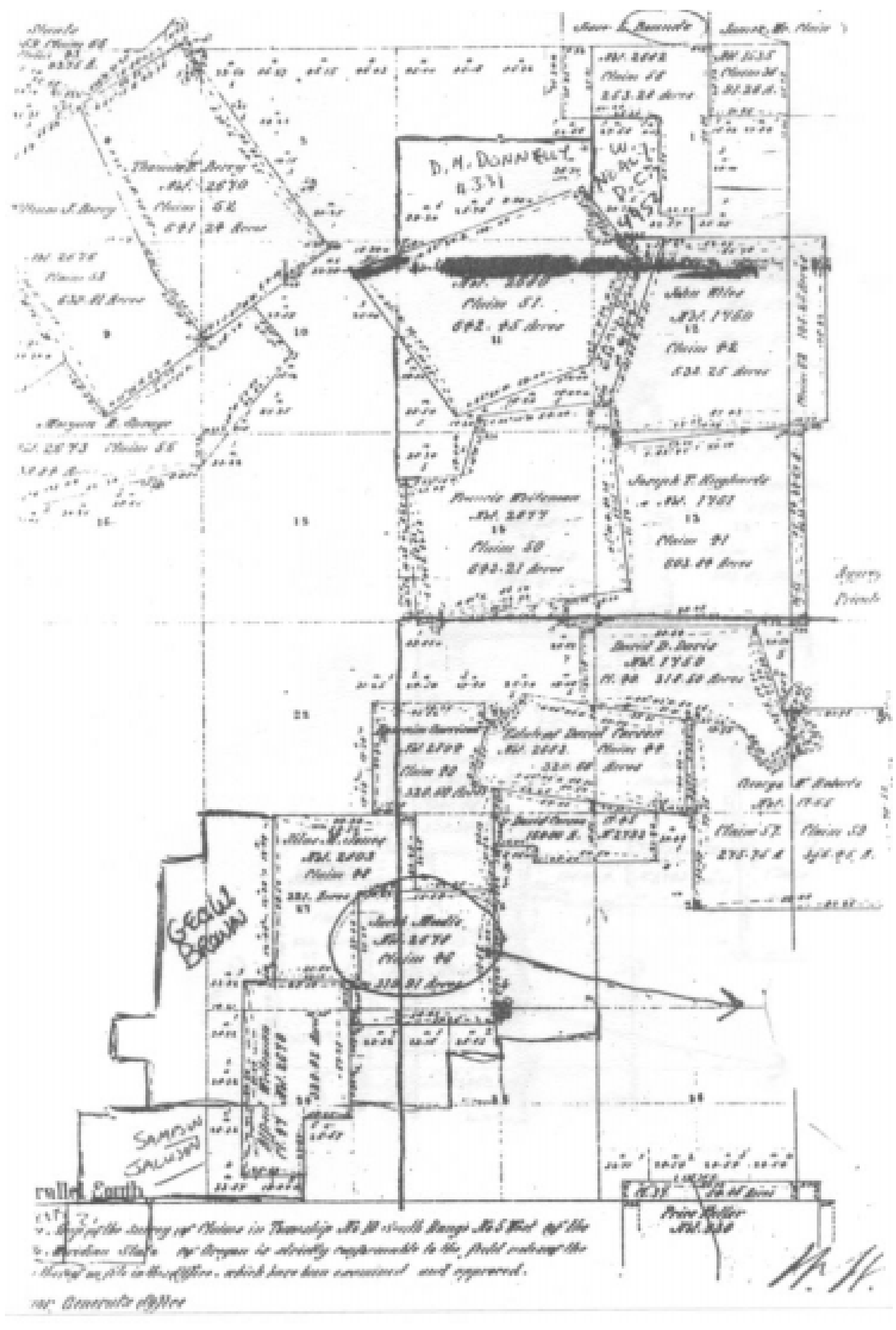


Fig. 24. Glen Moore Ranch, view SE from house, c.1899. This is a view of the old Alfred Writsman DLC (Map 11; Table D.2), looking toward current location of Soap Creek Schoolhouse (Map 2; Table 2) and McDonald Forest (Map 3). Photograph by Samuel Moore. Printed by permission of Myra Moore Lauridson and the Soap Creek Schoolhouse Association.

Fig. 25. Glender horse and tractor, c.1910. Photograph, taken near Glender barn, N. of Glender Hill (see Fig. 2; Map 2; Table 2), documents transition from livestock to combustion engines in Soap Creek Valley. Fuel needs of early 20th century Soap Creek Valley families quickly shifted from pasture and hay (see Fig. 18) for plowing, mowing, and transportation needs, to gasoline and diesel. Photograph provided by Eugene Glender, photographer unknown.

landowners to contract most harvesting labor to others (Oregon Weekly Journal 1923; Rohner 1993). Hardinggrass, not cultivated after 1941, continues to grow wild in small patches along Soap Creek ditches and roadsides (personal observation).

The Great Depression in the late 1920s, lasting until the start of WW II in 1941, was a difficult time for Soap Creek Valley farmers. Many lost their land to creditors, or were forced to sell at poor terms (Hanish 1994; Vanderburg 1995). New cars were repossessed, became old or disabled, and new families moved in and out of the area en masse, seeking employment as loggers, pole peelers, hop pickers, sawmill workers, truck drivers, farm hands, or whatever other employment might be gained (Hanish 1994; Vanderburg 1995; Hindes 1996). Local job opportunities for women, outside of the home, were generally limited to school teaching (Cook 1995; Dickey 1995).

In 1941, most farms and land in Soap Creek Valley (see Fig 26) were purchased by the US government for Army field combat training purposes, as a portion of Camp Adair (Berg 1983; Rohner 1993). Farmers were allowed to sell their livestock, or harvest their last planted crops, but only a small strip of farms to the south of Soap Creek Road (see Map 2) remained in private hands. Upon government acquisition of these lands, fences were torn down, buildings destroyed, rock mined, roads built, pioneer graveyards relocated, livestock removed, and cropland and forestland was used for military training purposes (Berg 1983; Dunn 1990; Polk County Museum Association 1992; 1993; Rohner 1993; Glender 1994; Rawie 1995).

Following the war, most Soap Creek Valley farmland was obtained by OSC Schools of Forestry and Agriculture for student education and research (Jackson 1980; Berg 1983; Dunn 1990; Rowley 1996; Davies 1997), developed into residential “hobby farms” (small farming or ranching operations generally less than 10 acres in size that provide supplemental income and/or recreational activity for their owners: see Grabe 1990), or developed into a community landfill (Webber 1996: personal communication). Currently, most commercial farming and ranching in Soap Creek Valley is performed by the OSU College of Agricultural Sciences Beef Barn operation (Miller 1996: personal communication). Virtually all other farming activities involve pasturage of pet horses, incidental

Fig. 26. Central Soap Creek Valley aerial photo, c.1950. Photograph shows degree of settlement, afforestation, and reforestation that has taken place in central Soap Creek Valley at approximate midpoint in time and distance between upper and lower photographs in Fig. 21. Note clearly visible DLC property boundaries dating to 1840s' Carson and Garrison provisional land claims (see Maps 2, 5 and 10; Table D.2). This aerial was used for classroom exercises by OSC Forestry students in the early 1950s (Rowley 1998: personal communication; photograph by Delano Aerial Surveys, Portland, OR. Annotations by author.)

management of established orchards, and/or raising of non-commercial gardens and occasional crops (Grabe 1990; Miller 1996: personal communication). A few local farming families continue to manage some croplands of their own and occasionally contract with absentee landowners to raise crops on adjacent lands (Webber 1996: personal communication).

Forestry and Logging (1846-1999)

"Forestry" and/or "logging" refer to European American practices with a basis in scientific methodology (MacCleery 1992). The first logging in Soap Creek Valley was performed with horses, oxen, axes, and cross-cut saws by pioneers of 1846-1858 to clear roadways and survey lines, build cabins, construct fences and bridges, and produce firewood and lumber (Thomas & Schroeder 1936; Longwood 1940). Kalapuyans quite likely peeled cedar, gathered acorns, harvested firewood, and, perhaps, occasionally felled trees in the Soap Creek Valley area (Wisner 1992). However, Kalapuyan tree management practices are generally unknown and are not considered to be forestry or logging practices for the purposes of this study.

The first commercial sawmills in Soap Creek Valley were probably established around 1890, near Sulphur Springs and the Soap Creek Schoolhouse (see Map 2; Table 2; Thomas & Schroeder 1936; Longwood 1940; Wisner 1992; Olson 1994). Clearcut logging practices were often employed to supply these early mills. Logs were mostly moved directly to the mill, downhill by horses (Rowley 1990: personal communication). In the early 1900s, most forestry practices in Soap Creek Valley were related to clearing young stands of oak and conifer to create pasture (Bagley 1915; Longwood 1940; Olson 1994; Cook 1995). Trees cut during these operations were piled and burned (Hanish 1994), converted to firewood (Cook 1995), and/or used for fencing (see Fig 18; Olson 1994).

In 1914 and 1915, changes in income tax laws and increases in the value of Douglas-fir logs resulted in the measure of timber volumes on private lands within the county (see Map 12 and Table 14; Benton County Commissioners 1914; Bagley 1915; Longwood 1940), including Soap Creek Valley timberlands. Table 14 is a copy of a portion of a typical cruise table constructed for this project (Bagley 1915; see Appendix G). It summarizes timber volumes on one of the most heavily timbered section in Soap Creek Valley at that time, Tsp. 11 S., Rng. 5 W., sec. 5. "Yellow fir" refers to old-growth Douglas-fir, "red fir" is second-growth Douglas-fir, and "white fir" is now called grand fir. Bagley (1915) noted the yellow fir "is a coarse grade and shows much defect" and the red fir "is mostly second growth of a very common grade," but the logging condition was "favorable as the entire section would log easily." He also noted that "nearly all" of the SE quarter of the section "could be cultivated when timber is removed," but that the "balance of the section is steep and rough; good for grazing only."

Map 12 is a sample of the maps produced during the 1915 timber cruise (Bagley 1915), one of two produced in conjunction with Table 14 (see Appendix G). This map shows, roughly, how timber was distributed within the section. More distinct distributions can be made with the aid of early aerial photographs, such as the 1936 series that produced Figs. 7 and 26 (see Chapter V). Both map and table demonstrate how each section was divided and cruised in 16 separate, standard PLS 40-acre square subdivisions, or "tracts."

Table 15 summarizes 1850s and 1880s PLS survey data for all BTs in Soap Creek Valley (see Map 2; Appendix F) This table helps identify likely locations and sources of tree seed for afforestation and reforestation processes since those times. Benton County cruise data for 1915 conifer timber volumes in Soap Creek Valley (see Table 14; Map 12; Appendix G; Bagley 1915) are correlated to BT species and locations in Table 15. These maps and tables show that a significant amount of commercial timber, including old-growth Douglas-fir, existed in Soap Creek Valley before WW I. Most of this timber was contained in a few thousand acres of steep Soap Creek headwaters that had been avoided by pioneer settlers and early farmers and ranchers (see Maps 2, 3, 5, 11, and 12).

In the 1920s, several small mills and a logging and sawmill camp were established in Soap Creek Valley (Glender 1994; Vanderburg 1995; Hindes 1996; Rowley 1996). Most log transport was still performed by horses, however contemporary forestry practices called for the broadcast burning of logging debris in order to reduce the potential for wildfire and to hasten the

Map 12. Bagley timber cruise map, T. 10 S., R. 5 W., S. 5, 1915 (Benton County Commissioners 1914; Bagley 1915). This map shows the location of the north-south Sulphur Springs to Oak Creek/Bald Hill trail described by Vanderburg (1995) for the 1930s and the Sulphur Springs to Kings Valley/Airlie trail described by Olson (1994) for the late 1800s. Note the size and location of relict native grasslands in relation to buildings and early automobile roadways. These early routes were apparent extensions of prehistoric Kalapuyan foot trails and early historical livestock trails (Braman 1987; Zybach et al., 1990).

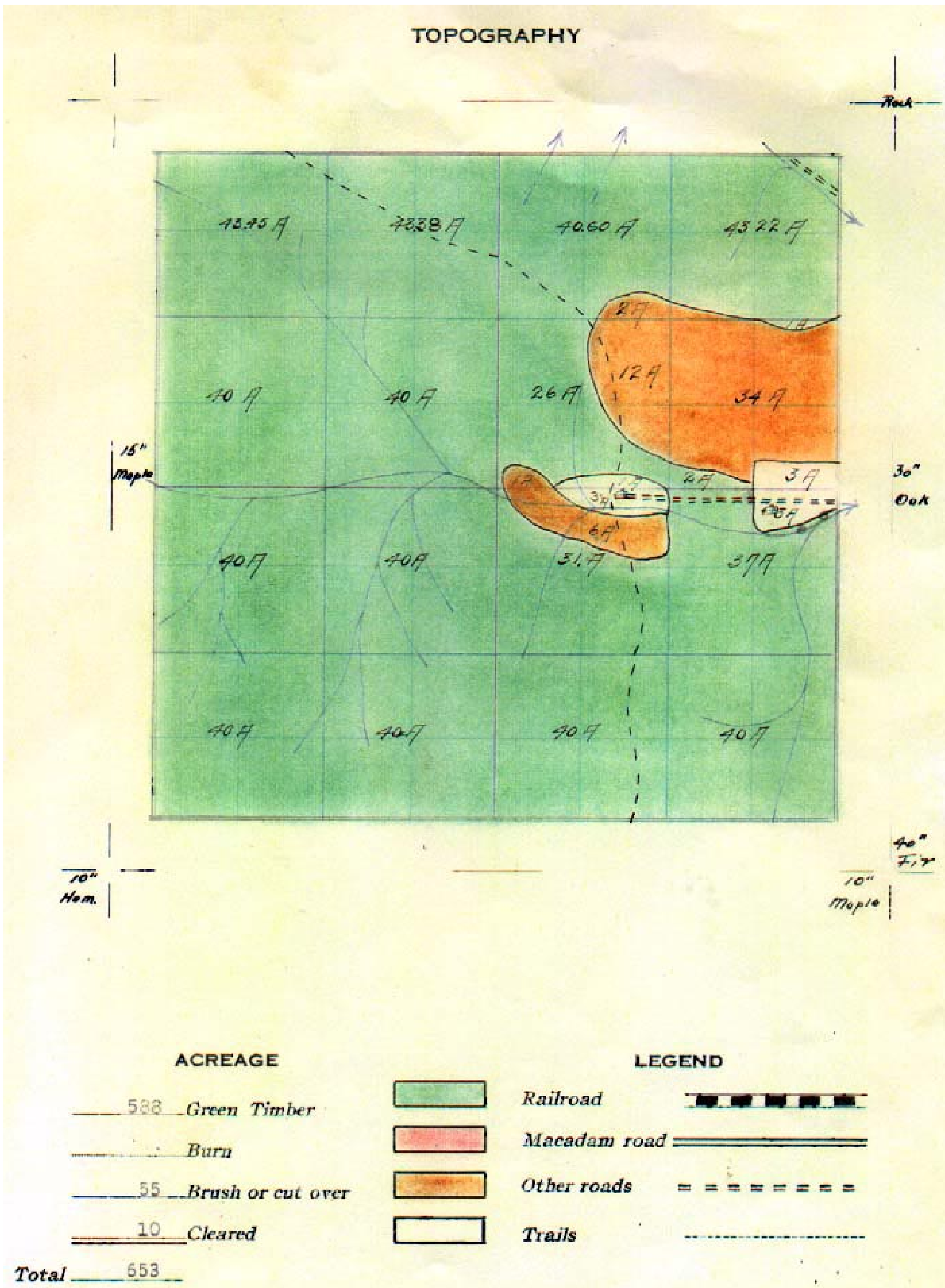


Table 14. Bagley timber cruise table, T. 10 S., R. 5 W., S. 5, 1915. Original on file in Benton County courthouse (Bagley 1915). Compare with Map 12, hand-colored original of which is printed on same form and page as this table. This section was mostly clearcut by its owner, Caffal Brothers, shortly after WW II. It was subsequently exchanged with OSC for a smaller parcel of land with timber and then added to the Paul M. Dunn Research Forest (see Map 3; Tables D.3 and D.4; Jackson 1980; Dunn 1990; Rowley 1996).

Timber Estimate, Surface Profile and Soil Report Section 5

TRACT	ACRES	YELLOW FIR				RED FIR				WHITE FIR				PILIN
		M	Logs per Tree	Av. Dia. Stump	% Surf'ce Clear	M	Logs per Tree	Av. Dia. Stump	% Surf'ce Clear	M	Logs per Tree	Av. Dia. Stump	% Surf'ce Clear	M
N E of N E	43	260	8	40	30	210	7	30		250	7	30	30	25
N W of N E	44	375	9	40	30	280	6	26						95
S W of N E	40					345	6	22						80
S E of N E	40					60	5	20						10
Total in Qr.	167	635				895				250				210
N E of N W	43	185	8	40	30	260	6	24						120
N W of N W	43	575	8	40	30	150	6	24		180	6	30	30	130
S W of N W	40					660	6	24						235
S E of N W	40	350	8	40	30	665	6	24						40
Total in Qr.	166	1110				1735				180				525
N E of S W	40	1100	9	42	40	150	7	28		90	7	34	30	45
N W of S W	40	1170	9	42	40	325	7	30		65	7	30	30	40
S W of S W	40	1075	9	40	40	375	6	26		125	6	26	30	45
S E of S W	40	1200	9	42	40	320	7	30		125	7	30	30	50
Total in Qr.	160	4545				1170				405				180
N E of S E	40	160	8	42	30	475	6	26		190	7	28	30	60
N W of S E	40	325	7	40	30	290	6	30						20
S W of S E	40					950	6	30						60
S E of S E	40	150	8	42	30	680	7	28		175	7	28	30	45
Total in Qr.	160	635				2395				365				185
Total in Sec.	653	6925				6195				1200				1100

establishment of pastureland or reforestation of clearcuts (Thomas & Schroeder 1936; Longwood 1940; Hanish 1994; Dickey 1995; Vanderburg 1995; Rowley 1996). Logging was mostly concentrated in areas of small diameter (12 to 24 inch) second-growth timber for the manufacture of railroad ties (Thomas & Schroeder 1936; MacCleery 1992; Wisner 1992; Vanderburg 1995; Hindes 1996).

In the 1930s, the development of the Oregon Forest Nursery (McDaniel 1931) and a US Civilian Conservation Corps (CCC) camp at Peavy Arboretum (Jackson 1980; Thomas 1980; Starker 1984; Sekermestrovich 1990; Zybach c.1991; Rowley 1996) led to the first major tree planting projects in Soap Creek Valley (see Fig. 19). During this same period, OSU began buying significant amounts of logged off land and young stands of trees through a bequest left by

Mary McDonald (Jackson 1980; Starker 1984; Dunn 1990; Rowley 1996) and a number of forestry practices and research projects were implemented by OSU forestry students and CCC personnel (Jackson 1980; Sekermestrovich 1993). During this period a permanent road system was established along the southern ridgeline of Soap Creek Valley (Nettleton 1956), following a centuries-old course used by local Kalapuyans and early pioneers (Zybach et al. 1990; Rowley 1996). By the 1930s and 1940s, tree falling was performed with power saws and much of the logging was accomplished with caterpillar tractors (Vanderburg 1995; Hindes 1996). Clearcutting remained a preferred method of harvest, although seed trees were often left for reforestation purposes (Dickey 1995; Vanderburg 1995).

Soap Creek Valley became a location for military combat training during WW II, which put a temporary end to most forestry practices in the area. Following the war, most forestland on the northern portion of The Valley was obtained by OSU College of Forestry, forming most of the current OSU Research Forests' Paul M. Dunn Forest (see Map 3; Jackson 1980; Dunn 1990; Rowley 1996; Davies 1997). Heavily timbered land that had been cruised in 1915 (see Table 14 and Map 12) was clearcut by its owner and traded to OSU for standing timber (Jackson 1980; Dunn 1990; Rowley 1990: personal communication). In the early 1950s, several large clearcuts on OSU property were made to generate revenue to pay for the Dunn Forest acquisitions (see Table 16) and numerous efforts were made with OSC student tree planters to afforest remaining hillside prairies, occasionally resulting in as many as seven or more attempts to forest the persistent grasslands (Nettleton 1956; Garver 1996: personal communication; Rowley 1998: personal communication). In the late 1950s, a contractor was hired to begin commercial thinning and salvage operations throughout the McDonald and Dunn Forests (see Map 3) and a director was established to begin formulating long-term management plans (Nettleton 1956; Jackson 1980; Dunn 1990; Rowley 1996; Davies 1997).

In October, 1962, the Columbus Day Storm traveled the complete length of western Oregon, damaging thousands of acres of timber (Lucia c.1963). Several stands of trees in Soap Creek Valley, particularly along the ridges, were blown over in this storm, and downed timber was salvaged (see Table 16; Jackson 1980; Blanchard 1995, personal communication; Rowley 1996; Davies 1997). Many of

Table 15. Old-growth and 2nd growth timber volumes, 1852-1915. See Appendices F an G; Maps 2 and 3; Tables 2 and 14. Timber volumes are Scribner scale (Andrews & Cowlin 1940).

T-R-S	Seed 1	DF	DBH	BM	OG MBF	2G MBF	WF
11-5-6	1600 DF/RC	4	6-60	3	12,230	16,310	2,500
11-5-5	1650 DF/WF	3	6-12	1	6,925	6,195	1,195
10-5-32	1650 DF/WF	5	10-50	3	4,310	5,170	340
11-5-7	1650 DF/WF				2,690	1,365	345
11-5-8	1650 DF/WF	1	14	1	2,660	8,600	1,050
11-5-3	1650 DF/WF			1	1,650	5,280	370
11-5-4	1650 DF/WF	1	60		1,075	4,290	430
10-5-33	1650 DF/Oak	2	8-10		765	2,845	55
10-5-22	1650 DF/Oak	1	24		550	4,850	415
10-5-28	1650 DF/Oak	3	8-13	1	350	2,530	
10-5-35	1650 DF/Oak				340	3,275	
11-5-9	1700 WF/DF				275	4,395	635
11-5-2	1650 DF/Oak				225	1,075	
10-5-29	1650 DF/Oak	2	8-30	1	80	625	
10-5-15	1800 DF/Oak					2,250	
10-5-23	1750 DF/WF			1		800	225
10/5/27	Oak/Maple			1			
10/5/25	Oak/Maple			1			
10/5/26	Oak/Alder						
10/5/34	Oak/Willow						
10/4/18	Oak						
10/4/30	Oak						
10/5/10	Oak						
10-5-12	Ash/Oak						
10-5-13	Ash/Oak						
10-5-24	Oak/Ash						
10-5-14	Oak/Ash						
10-5-11	Oak/Ash						
10-4-7	Oak/Ash						
10/4/19	Oak/Ash						
30 Sec.	Total	22	6-60	14	34,125	69,855	7,560

T-R-S	Township S., Range W., Section
Seed 1	1915 cruise data, age est. DF = Douglas-fir, WF = white fir, RC = redcedar
DF	Number of PLS Douglas-fir BTs, 1852-1882
DBH	Range of Douglas-fir BT "diameters at breast height" (approx. 4 1/2 feet above ground level)
BM	Bigleaf maple BT numbers, 1852-1882
OG MBF	Old-growth Douglas-fir timber volumes, thousand board feet, 1915
2G MBF	2nd growth Douglas-fir timber volumes, thousand board feet, 1915
WF MBF	White (grand) fir timber volumes, thousand board feet, 1915

the horizontal forest cover patterns that exist to this day can be traced to the effects of the Columbus Day Storm and resulting management actions implemented at that time (Rowley 1996; Rowley 1998: personal communication; personal observation).

From the late 1960s to the 1980s, forestry practices in Soap Creek Valley remained generally stable, with emphasis placed on commercial thinning, salvage logging, and tree planting practices on OSU properties, and clearcutting, site preparation, and tree planting on private lands. In the late 1980s, local increases in residential development and focused public attention regarding management of endangered species (see Chapter I) led to a number of conflicts between forest managers, local residents, College of Forestry administrators, and some OSU faculty (Garver 1990: personal communication; Anderson 1993; Rowley 1996). The creation of a formal Research Forests forest plan in 1993 attempted to change the direction of established Research Forests management practices by being more responsive to local public interests (OSU College of Forestry Forest Planning Team 1993). By 1996, the plan remained in draft form, although it was in the process of being implemented (Sessions 1996: personal communication). The current status of the draft plan is uncertain.

Discussion. Public perceptions of poor management of OSU forestlands by OSU Research Forests includes concern that Soap Creek Valley timberlands are being managed almost solely for commercial gain rather than managing for "biological diversity" (or "biodiversity"). This is an issue raised in the local press (Garver 1990: personal communication; Anderson 1993) and OSU texts (Hunter 1990; Anderson & Runciman 1995). Hunter (1990), for example, claims that "managing for biological diversity is of critical importance because it is essential to the ecological well-being of the planet." Thomas agrees with Hunter, claiming "a de facto policy of biodiversity protection . . . is the overriding objective" of forest management in the US, particularly for the Pacific Northwest (Thomas et al., 1993). Hunter (1990) contrasts "biodiversity management" with industrial forest practices (those that typify most Soap Creek Valley forestland stand and plantation management of this century):

> Natural forest stands in which a single species is dominant are moderately common, but natural stands almost entirely composed of a single tree species are rather rare. In contrast, most plantations are nearly pure monocultures . . . and they have a widespread reputation for supporting an impoverished flora and fauna.

Table 16. OSU Research Forests logging volumes, 1949-1979 (Jackson 1980; Dunn 1990). These volumes were largely harvested from Soap Creek Valley (see Map 3). Note harvests of 1952-1953, which were used to pay US for acquisition costs of Paul M. Dunn Research Forests (Dunn 1990), and harvests of 1962-1966, which were in response to blowdown caused by the Columbus Day Storm of 1962 (Rowley 1996; Davies 1997).

Cut-McDonald-Dunn Forests
(1000's of Board Feet)

Year	McDonald		Dunn		Both Forests	
	Annual	Cummulative	Annual	Cummulative	Annual	Cummulative
1949-50	31.97	31.97			31.97	31.97
1950-51		31.97				31.97
1951-52	766.40	798.37			766.40	798.37
1952-53	18.25	816.62	6105.00	6105.00	6123.25	6921.62
1953-54	100.00	916.62			100.00	7021.62
1954-55		916.62	156.02	6261.02	156.02	7177.64
1955-56	238.65	1155.27	3504.29	9765.31	3742.94	10920.58
1956-57	271.25	1426.52	575.99	10341.30	847.24	11767.83
1957-58	373.90	1800.42	50.97	10412.27	444.87	12212.60
1958-59	492.09	2292.51	56.12	10468.39	548.21	12760.90
1959-60	1013.06	3305.57	750.15	11218.54	1763.21	14524.11
1960-61	1474.29	4779.86	1418.66	12627.20	2892.95	17417.00
1961-62	2537.65	7317.51	2505.05	15142.25	5042.70	22459.70
1962-63	5125.88	12443.39	1180.45	16322.70	6306.33	28766.00
1963-64	2780.94	15234.33	2827.73	19150.43	5618.67	34384.70
1964-65	1623.95	16858.28	4760.57	23911.00	6384.52	40769.28
1965-66	4876.93	21735.21	813.80	24724.80	5690.73	46460.01
1966-67	3887.01	25622.22	61.16	24786.41	3948.62	50408.63
1967-68	988.16	26610.38	1803.31	26589.72	2791.47	53200.10
1968-69	544.61	27154.99	2132.62	28722.34	2677.23	55877.33
1969-70	1572.00	28726.99	2602.90	31325.24	4174.90	60052.23
1970-71	3664.13	32391.12	764.41	32089.65	4428.54	64480.77
1971-72	2122.03	34513.15		32089.65	2122.03	66602.80
1972-73	2063.11	36576.26	840.74	32930.39	2903.85	69506.65
1973-74	1421.35	37997.61	1975.27	34905.66	3396.62	72903.27
1974-75	2263.27	40260.88	718.44	35624.10	2981.71	75884.98
1975-76	1785.16	42046.04	2056.34	37680.44	3841.50	79726.48
1976-77	1236.93	43282.97	2436.73	40117.17	3673.66	83400.14
1977-78	3886.23	47169.20	345.25	40462.42	4231.48	87631.62
1978-79	2069.79	49238.99	1726.04	42188.46	3795.83	91427.45

Hunter (1990) further asserts that: 1) “natural stands almost entirely composed of a single tree species are rather rare,” 2) “most plantations are nearly pure monocultures,” and 3) plantation-monocultures have a “widespread reputation for supporting an impoverished" wildlife. Soap Creek Valley is a typical portion of the Douglas-fir Region, within which nearly pure stands of even-aged Douglas-fir, grand fir, lodgepole pine, western hemlock, Sitka spruce, and other conifer species are the general rule (Andrews and Cowlin 1940; Stout 1981), and provides a counterpoint to Hunter's assertions (see Figs. 14, 19, 20, 21, and 22; Map 12; Tables 14, 15 and 16). Even-aged, nearly pure stands of juniper, larch, lodgepole, and yellow pine in eastern Oregon, Idaho, and Washington demonstrate that the phenomenon is not limited to the Douglas-fir Region, and extends throughout most of the Pacific Northwest. Munger's (1940) first-hand observations from the early 1900s provide a good overview of this point:

> The paths of the great forest fires of the last century or two are plainly marked by even-aged stands, consisting to the extent of at least 90 per cent of Douglas fir (if within the preferred habitat of this tree), regardless of the proportion of Douglas fir in the original fire-killed stand.

Therefore, the even-aged stands of nearly pure Douglas-fir that have been established in Soap Creek Valley during the past 170 years, for the most part, mimic "natural" stands that have existed throughout the Douglas-fir Region for centuries. To examine Hunter's third point, that such environments are "impoverished" of biological diversity, the measures of species "richness" and species "importance" (or "evenness" of distribution) can be used. Table 12 (see Tables E.1 and E.2) demonstrates that species richness has been relatively constant for wild terrestrial vertebrates in Soap Creek Valley during the past 200 years (before and after the introduction of plantation forestry), with introduced species roughly equal to exterminated species. Table 13, however, shows a marked increase in wild vascular plant species richness, particularly for understory herbs and shrubs, and for grasses. (Species importance will be examined more closely in Chapter V.)

<u>Summary</u>. Principal changes in Soap Creek Valley logging and forestry practices during the past 150 years have been the: initiation of large-scale clearcuts (Fig. 19 and 21; Table 16); establishment of large tracts of even-aged Douglas-fir trees through purposeful seeding and plantations (Figs. 14, 19, 20, 21 and 22); construction of several miles of permanent roadway; consolidation of land ownership into major blocks controlled by OSU and a small number of

private owners (see Map 3; Table D.4; Dunn 1990; Sekermestrovich 1993; Davies 1996); and the creation of a formal forest management plan open to public review (OSU College of Forestry Forest Planning Team 1993; Garver 1996: personal communication; Rowley 1996; Sessions 1996: personal communication).

Hunting, Fishing, and Gathering (1500-1999)

Kalapuyans were known to visit hunting, fishing, and gathering sites as soon as they became free of snow, game became available, and/or plants became harvestable. Many valued Soap Creek Valley plants existed throughout the entire growing season, including redcedar, yew, arrowwood, and brackenfern. These activities were generally accompanied by daily fires, which included field burning, cooking, food processing, and heating fires. The incidental and cumulative effects of fire and fuel gathering possibly resulted in the greatest hunting- and fishing-related impacts to wildlife habitat in Soap Creek Valley during the past 500 years.

Early immigrant families had access to pack teams, metal traps, guns and gunpowder; combined technologies that proved capable of quickly exterminating entire species of prized or reviled animals (see Figs. 13, 14, and 15; Tables 12 and E.2). The consequences of these options led to early local elimination of whitetail deer, beaver, mink, and other valued mammals, and extermination of animals perceived as threats to safety or livestock, including rattlesnakes, grizzly bears, wolves, wolverines, cougars, and, possibly, Canadian lynx (Fagan 1885; Storm 1941; Sondenaa 1991). Subsequent adoption of specific game seasons and invention of fossil fuel stoves in the early 1900s led to decreased need for open fires and firewood away from home bases, and for reduced periods of times.

Similarly, Kalapuyan crops of camas, acorns, tarweed, sunflowers, huckleberries, blackberries, onions, and other seeds, bulbs, and fruits commonly gathered and prepared for Winter food stores, were nearly eradicated by grazing and rooting livestock of the pioneers, particularly cattle, sheep, and hogs (Longwood 1940; Storm 1941). Hunting, fishing, and gathering were relegated to recreational gaming activities, with Chinese pheasants being introduced into Soap Creek Valley fields as early as 1883 (Storm 1941), and rainbow trout being introduced into local streams in the early 1900s (Glender 1994). Seasonal gathering and food processing operations, critical to the survival of Kalapuyan families and their predecessors, were replaced with year round residents who depended upon domesticated plants and animals for subsistence. Kalapuyan practices were soon forgotten, or relegated to seasonal sporting activities.

Land Subdivision and Home Construction (1846-1999).

Presettlement Kalapuyan families in the Willamette Valley were believed to be somewhat migratory, living in the open or in base camps during drier parts of the year, in proximity to seasonal crops or favored hunting areas (Collins 1951; Boyd 1986; Gilsen 1989). Pioneer white and black American settlers in 1846 dramatically changed human survival strategy in Soap Creek Valley by establishing permanent homesites throughout the landscape, particularly in lowlands suited for agricultural development (see Maps 4 and 10; Longwood 1940; Bowen 1978; Rawie 1995). At that time, Oregon landownership questions were being decided by the governments of Britain and the US, and did not consider claims made by native residents—or any non-white individuals, for that matter (Carey 1961). Each of the original landowners was given a claim of 160, 320, or 640 acres (one square mile), depending on whether they filed before or after 1850, and whether they were filing as a single, white individual, or as a white, married couple (Zybach & Meranda 1989). Most pioneer Soap Creek area claims were filed by families before 1850 and, as a result, each new home was constructed an average of about a mile away from the nearest neighbors. This initial pattern of ownership and development seems based on prehistoric patterns of settlement and use (Snyder 1979; Bell 1981; Zybach et al., 1990; Rohner 1993), and also forms the basis of current land ownership and home construction patterns (see Maps 2; 3; 4; 11; Tables D.2 and D.4).

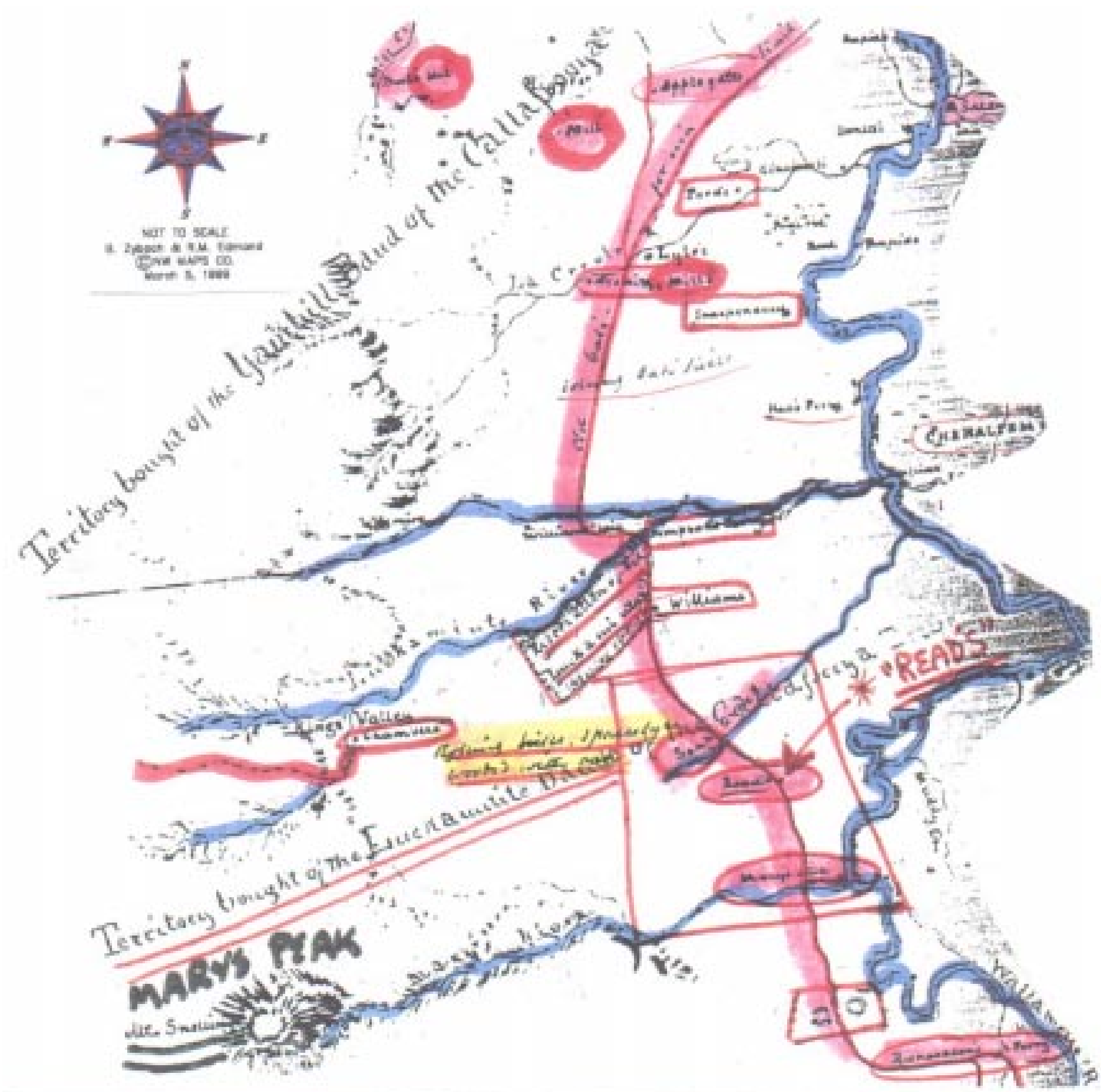
Following acquisition of the Oregon Country from Britain in 1846 and passage of the Oregon Donation Lands Claim Act of 1850, US legislators determined that local natives should be compensated for their claims to Willamette Valley lands that had been settled by American immigrants (Carey 1971; Mackey 1974). On the morning of May 1, 1851, US officials met with representative members of the Chapanafa and Luckymute (or, Luckiamute) Kalapuyan nations (see Appendix H; Figs. 1 and 5; Map 10; Table D.1) at

Champoeg, Oregon to negotiate the purchase of their ancestral homes in the Marys River and Luckiamute River basins. These lands included Marys Peak, Kings Valley, Soap Creek Valley and the current sites of Dallas, Corvallis, Philomath, Oregon State University, and the Finley Wildlife Refuge (see Map 13; Zybach, Barrington, & Downey 1995). The previous day, under direction of US Agents, three tribal representatives had been selected to represent the 44 men, women, and children that remained of these once-numerous nations (Mackey 1974). These families were the combined survivors of two nations that had been decimated by the plagues of 1831-1835 and who believed, in 1851, that their own race would not continue much longer. The Kalapuyan families and their new representatives had then been sent back to their camps to discuss and "sleep on" the government's offer to pay them to release title to their ancestral lands, vacate the Willamette Valley entirely, and move to a reservation east of the Cascade Mountains. Government records show the following exchange at the beginning of the May 1st meeting (Mackey 1974):

> Judge Skinner asked the Chiefs if they had reflected over and consulted among themselves; what had been said to them.
>
> Scho-la-que Said, they had, and that they did not wish to leave the country where they had always lived! That they were now but few, and that in a short time there would be none of them left. He said none of them would live long, but that little time they had to live, they wished to spend in the land where their Fathers had lived, and where their relatives and friends were buried.
>
> Col. Allen Asked if the United States would agree to give you more for your lands by your removing beyond the Cascades, than if you remained would you not rather go, than to have less, by remaining?
>
> Daboe. Never! Never! We do not wish to leave our Country.

A few hours later, Daboe ("Jim"), Scho-la-que ("John": this may be John Harris, "Capt. Santiam," or "old Santiam" of the 1860 Grand Ronde Reservation census; see Whitlow 1988), and Yuh-kow (Nuh-kow?) had signed an agreement to sell all of their ancestral territory, including most of Benton and Polk Counties, for $20,000 and a small reserve centered at present-day Airlie, beginning at the junction of Berry Creek Road and Airlie Road (see Maps 2 and 13). The agreement was later rescinded by the US Congress, and in 1855 the Kalapuyans were sent, with little compensation, to the Grande Ronde reservation in Yamhill

Map 13. Territory bought of the Luckiamute Band of Callapuya, 1851. This annotated detail from "Sketch of the Wallamette Valley" (Gibbs and Starling 1851), shows the original lands ceded from, and reservation boundaries given to, surviving members of the Chapanafa and Luckymute nations. This is the earliest map to depict the name "Soap Creek" or to describe the general nature of Soap Creek Valley forestland: "Rolling hills sparsely wooded with oak." The map also shows the "old California Trail" wagon road constructed through Soap Creek Valley in 1846; later known as the "Applegate Trail," or the "South Road" of the Oregon Trail. Also note the several references to "mills," the location of Thomas Reed's ("Read's") DLC (currently, Peavy Arboretum), "Mt. Snelling" (Marys Peak), and "Marysville" (renamed Corvallis in 1853). "Williams" was located SW of the junction of Berry Creek and Airlie Roads (see Map 2; Vanderburg 1995).



County, along with a number of other western Oregon Indians and Metis (Whitlow 1988; Jackson 1995).

A growing immigrant population, combined with large provisional and DLC land claims, soon led to a shortage of building sites throughout the Willamette Valley, including Soap Creek Valley. Towns were established in strategic locations convenient to pioneer farmers and trades people, following the example of other areas of the world settled by Europeans during the past 500 years (Bowen 1978; Crosby 1986). In Soap Creek Valley, the town of Tampico was platted in 1857 (see Maps 2 and 14; Figs. 27 and 28) near the new Tampico School, the local tavern, and the Post Office, at a major wagon road intersection to Fort Hoskins (established with the Siletz Indian Reservation in Kings Valley, to the east of Soap

Map 14. "Plot of the Town of Tampico," 1857 (Zybach 1989). The first attempt to subdivide Soap Creek Valley lands into building lots was the October 27, 1857 platting of Tampico. Only a few buildings were constructed within the town's borders, and Tampico was officially shut down on January 23, 1860 by Green Berry Smith, who had obtained clear title to it earlier that day (see Figs. 27 and 28; Zybach and Meranda 1989). Note Tampico location, shown as a solid rectangle, in Tsp. 10 S., Rng. 5 W., Sec. 24 on Map 2.

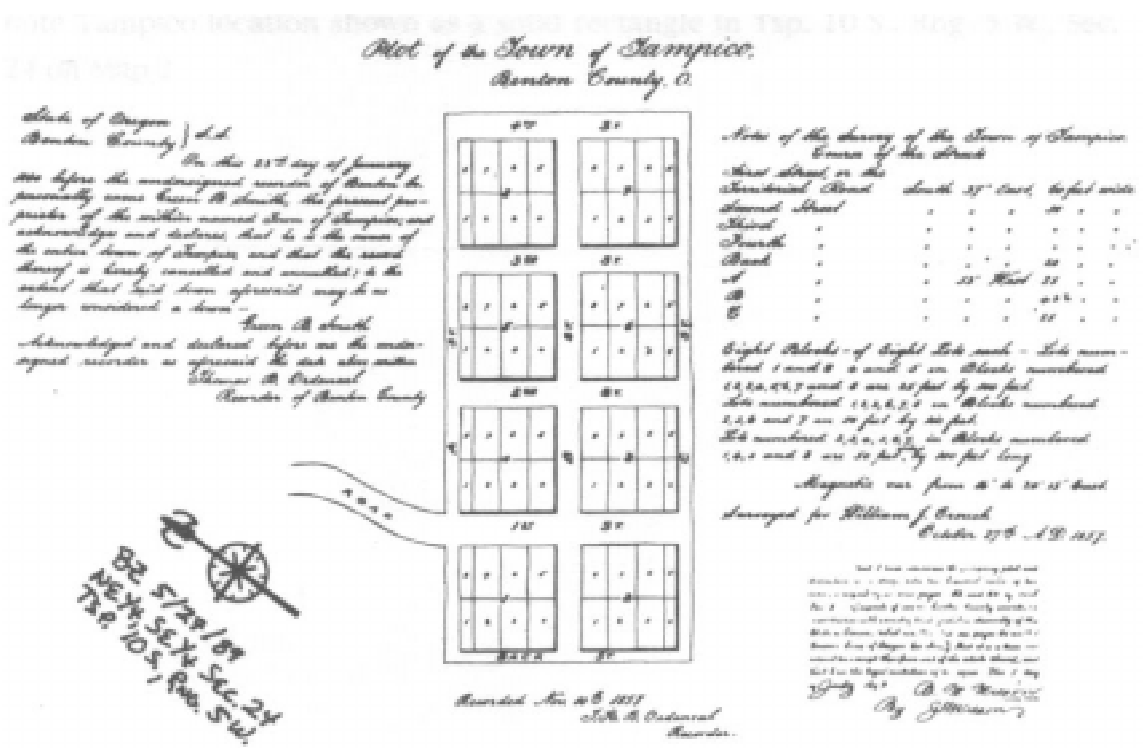


Fig. 27. Tampico, "Early Rival of Corvallis," c.1856-1904 (Zybach 1989).
Upper Painting. This watercolor was painted by William Ball, supposedly under the direction of John Horner (Munford c.1989), in 1925. The title, "Early Rival to Corvallis," may have been the result of historical embellishment, as Corvallis was an established and thriving riverfront town in 1857, when Tampico was first platted (see Map 14). The painting appears to be based on the recollections of former Tampico resident, James Hunter, who detailed the town's structures and citizens to "Dr. W. E. Blake," at his home in Ashland, Oregon, on January 24, 1926 (Blake 1926). The original, colored version of this painting was in possession of OSU Horner Museum in 1989.
Lower Photograph. This photograph of the "Arcade Saloon," was made in 1904. The saloon was built in 1858 by Bill Bowers, owner and bartender, and was likely the center of many of the town's legendary stories of gambling, fist fighting, dancing, religious revivals, and horse racing (Zybach & Meranda 1989). Note the vegetation patterns on the Soap Creek floodplain and the base of Coffin Butte in the background. The photo was given by the Glender family to the Soap Creek Schoolhouse Foundation in the 1980s (Grabe 1990). Photographer unknown.

Fig. 27

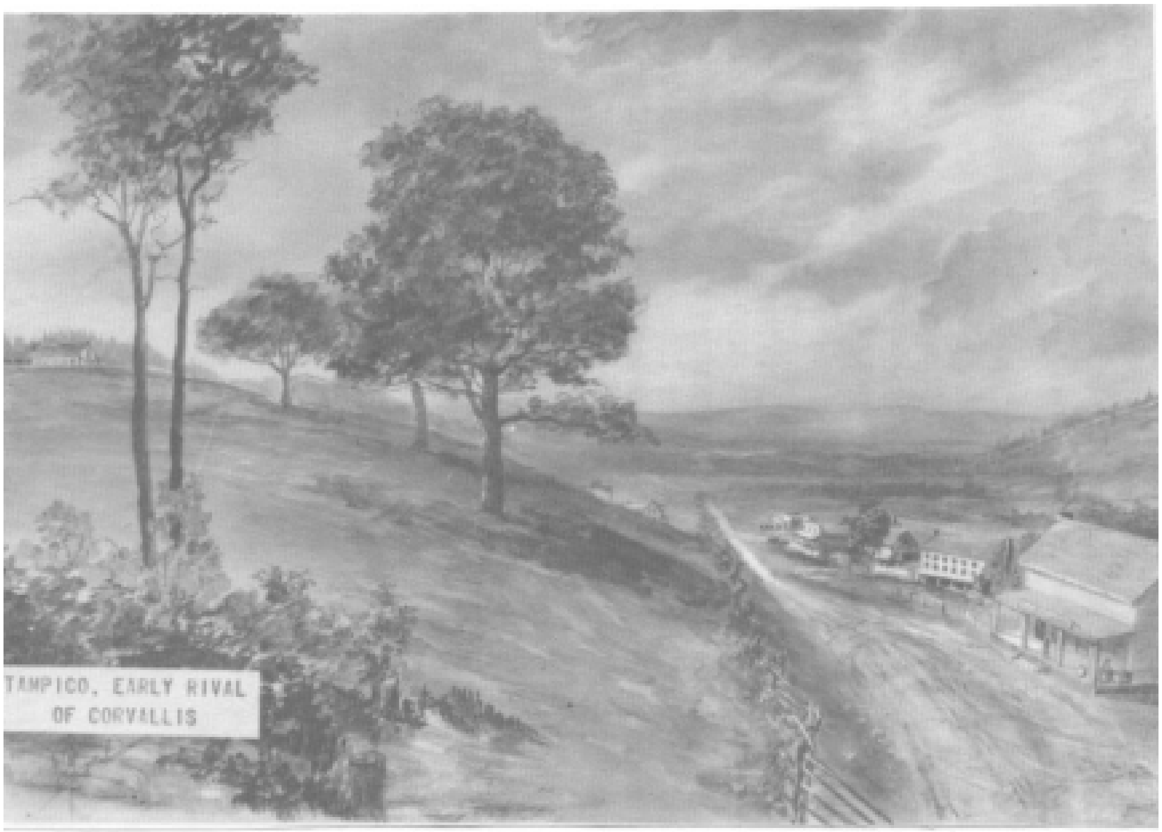
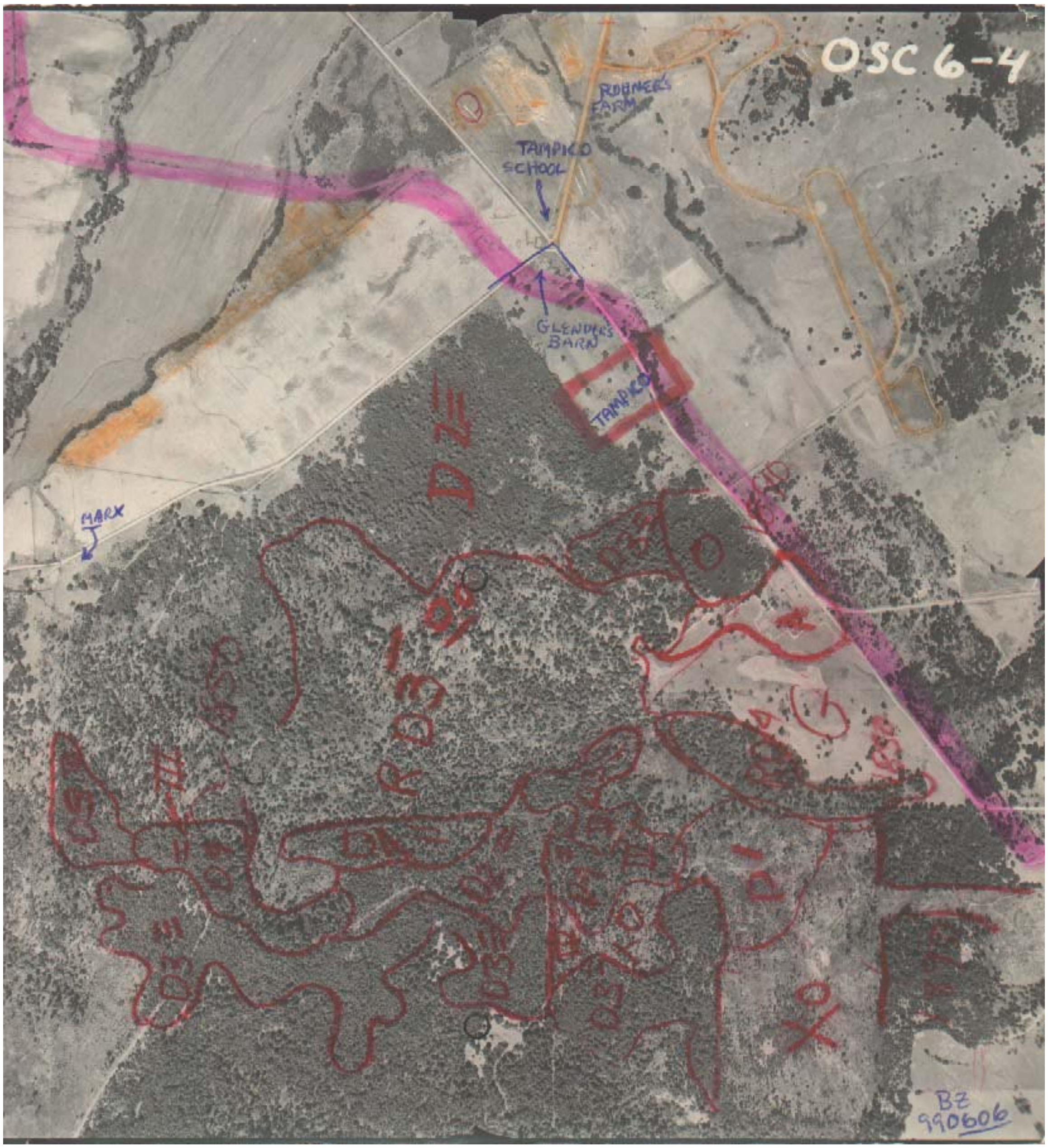


Fig. 28. Tampico and California Trail traces, c. 1951. This aerial photograph was used by OSC Forestry students in the early 1950s to map forest cover patterns. Newer annotations by Zybach show the approximate locations of the 1845-1851 California Trail, 1857-1860 Tampico, 1905-1920 Marcks home (Cook 1995), 1941-1945 military traces from Camp Adair, and the modern location of Glenders' barn (Sardell et al., 1999) as reference. Note the widespread evidence of logging in the southern portion of the photograph.



Creek Valley, in 1855; see Map 13; Olson 1994), from the "old" California Trail (see Maps 2, 13, and 14: "1st St."; Fig. 28). By 1857, this route, and perhaps the cutoff to Kings Valley, had been used by HBC trappers for more than 30 years, by livestock owners for more than 20 years, and by Oregon Trail pioneers for more than 10 years. Unfortunately for local real estate developers, the road between Corvallis and Portland was straightened and bypassed Soap Creek Valley to the east of Tampico in the early 1850s (see Map 2: "Hwy. 99 W."), Fort Hoskins traffic was made off limits due to Civil War politics in 1859, and the town was disbanded for economic reasons in 1860 (Zybach and Meranda 1989). By 1900, only a few abandoned buildings remained to indicate Tampico's short and colorful history (Fig, 27; Horner 1926; Davis & Davis 1978; Zybach 1989; Zybach et al., 1990; Glender 1994).

In the 1890s and early 1900s, European immigrants from Sweden (Olson 1994), Germany (Glender 1994; Cook 1995), Switzerland (Rohner 1993), Russia (Rohner 1993; Glender 1994), Ireland (Rawie 1994), and Italy (Glender 1994) began to move into Soap Creek Valley, subdividing the large pasturages and property ownerships established by the pioneers of the 1840s and 1850s (Map 11) into smaller, family farms (Figs. 26, 28 and 29). As the population of the Willamette Valley continued to grow, homesteads were established on more marginal hillside lands, often for purposes of grazing livestock or clearing timberland (Olson 1994; Hanish 1994). By the 1920s, Soap Creek Valley was dominated by farming and ranching families (Table D.3), with two or more public schools operating at a time (Tampico, Soap Creek, and Wells districts: see McDonald 1983; Grabe 1990; Rohner 1993; Glender 1994; Rawie 1994; Cook 1995; Hindes 1996). In 1928, a sawmill and logging camp, complete with its own store, was established near the Soap Creek Schoolhouse (Wisner 1992; Hindes 1996). This camp (visible in the lower southeast corner of Fig. 29, marked by an asterisk) housed several new Soap Creek Valley families, generally employed to log the central portion of The Valley during the late 1920s and early 1930s (see Map 15).

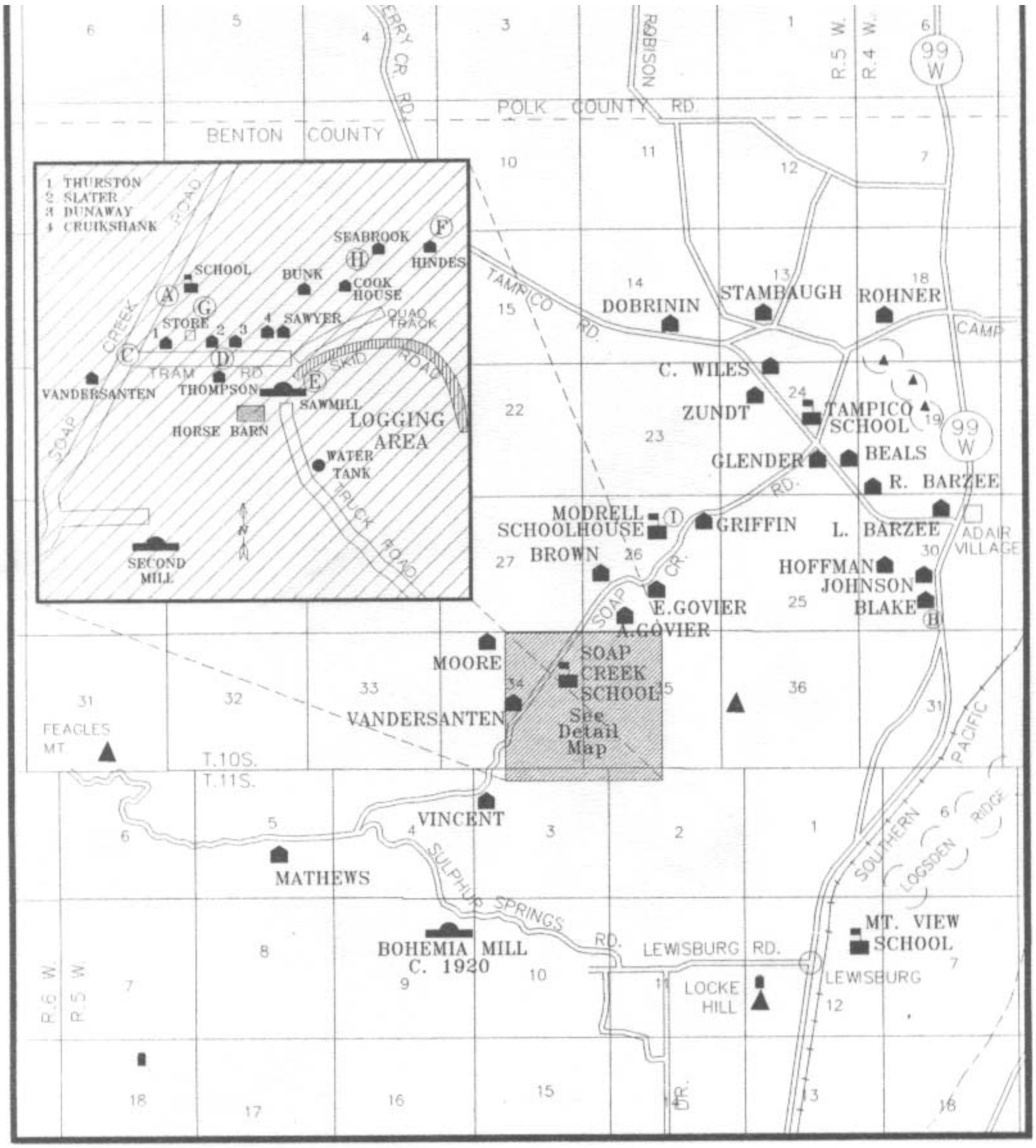
The Great Depression of the 1930s temporarily ended home construction and most sawmilling activities in Soap Creek Valley (Fig 19), and horizontal landscape and development patterns remained relatively stable from the early 1930s until 1940. The establishment of Camp Adair in 1941 (Polk County Museum Association 1992; 1993) caused most families to sell their homes (Map 16), many of which were subsequently destroyed by military exercises (Map 17;

Fig. 29. Southern Soap Creek Valley, c.1936. Note locations of orchards, homes, and fenced crops in relation to pioneer land claims (Maps 2 and 11; Fig. 25). Also note location of logging camp in lower right corner and compare with Map 15. This photograph can be correlated to locations of several Soap Creek Valley oral history informants and mapped tours and to local landowners at the time the photograph was taken (Map 9; Tables 2 and D.3; Hindes 1996).

Berg 1983; Loew 1993; Rowley 1996). After the war, most Soap Creek Valley land owned by the Army was sold to OSU (Dunn 1990; Davies 1997; see Map 3) and remaining government properties were purchased by a few farmers and real estate speculators (Glender 1994). The residential population of The Valley temporarily remained lower than levels of the 1920s and 1930s.

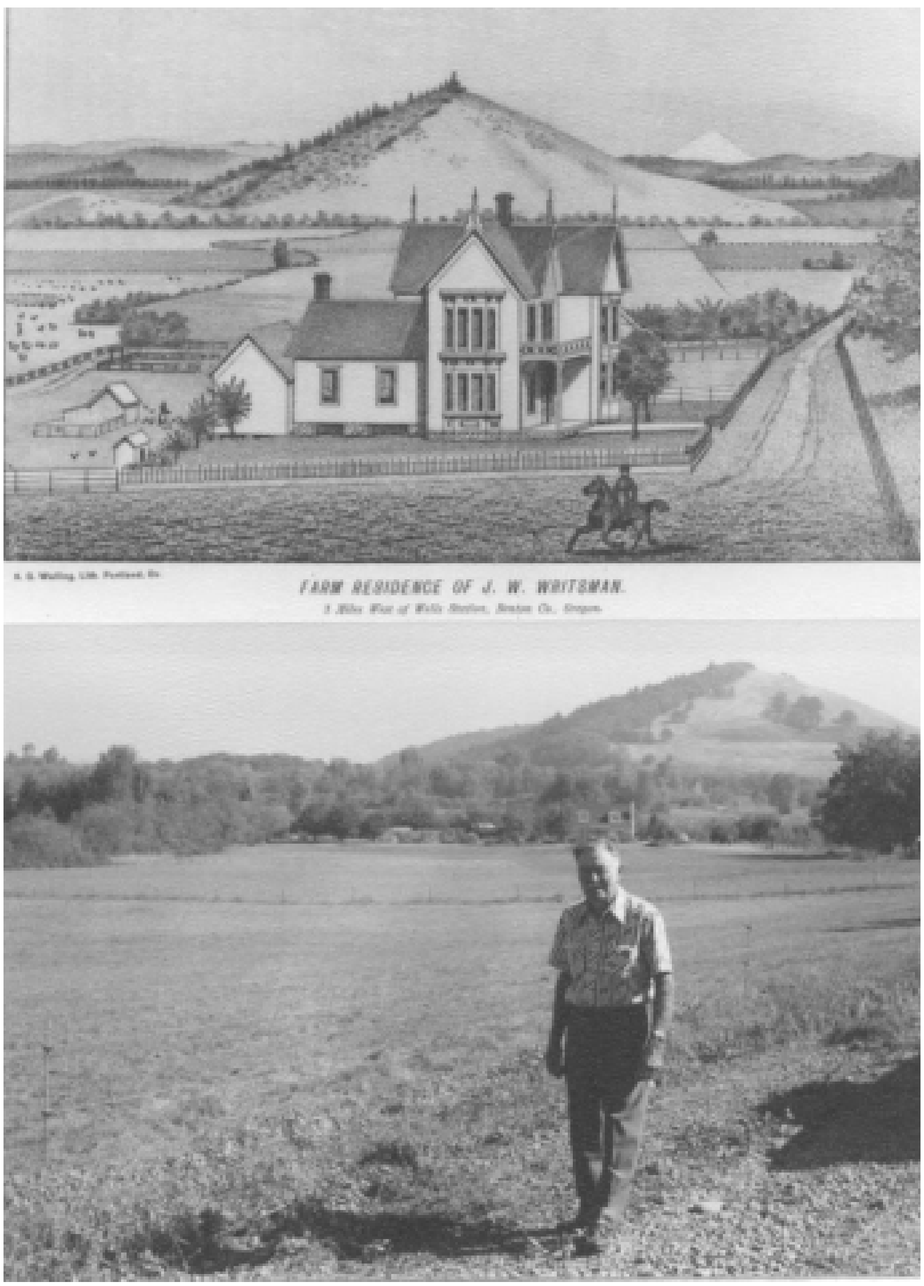
In the 1960s, several parcels of agricultural land were subdivided and developed into residential properties, averaging 4 or 5 acres each (Grabe 1990). This practice of residential subdivision and development has continued to the

Map 15. Hindes' map of 1929 Soap Creek Valley logging camp, 1994. This map was constructed from a hand drawn map by Charles Hindes, a 1936 aerial photo (Fig. 27), and an on-site surface examination with two Soap Creek Valley informants who lived in the camp from 1929 until 1931 (Hindes 1996).



present time (see Figs. 22 & 30; Map 3; Table D.4), with dozens of new homes having been constructed in Soap Creek Valley during the past 20 years (Grabe 1990; Garver 1996: personal communication). By 1990, over 200 parcels, with an

Fig. 30. Coffin Butte real estate development, 1885-1990.
Upper Drawing. Landscape drawing by Pickett (Munford c. 1993; see Fig. 17), first published in 1885 (Fagan 1885), and reprinted in 1989 (Zybach 1989). The reprint came to the attention of Jake Rohner (lower photograph), who subsequently provided significant information to this study (<u>Rohner 1993</u>; see Tables 1 and 2; Map 9). View is from northern base of Writsman Hill, eastward, and approximates view of Mt. Jefferson noted by Douglas (1905) in October, 1826.
Lower Photograph. Jake Rohner was born in the house shown in upper drawing (<u>Rohner 1993</u>). He is shown near the former site of his childhood home, in 1990. Note the new home construction in the background. Location of this photograph is near construction of three newer homes, visible in June, 1999 photograph of Writsman Hill (see Fig. 22). Photograph by author.



average size of about 4 acres, had been created in The Valley for the specific purpose of building single-family dwellings (see Map 3; Table D.4).

Summary. Table 17 tabulates general trends of property ownership and residential occupation in Soap Creek Valley at key points in time during the past 160 years (see Appendix D). The first permanent homes in The Valley were constructed in 1846 and 1847 for the use of pioneer farming families, who lived in them year round. The residential population grew slowly and sporadically to the 1920s, by which time several dozen families lived in The Valley. Most of these families operated subsistence farms, although many family members worked as employees for other farmers, as loggers, or in local sawmills. The population generally declined throughout the 1930s until 1941, when WW II resulted in the abrupt removal of most Soap Creek Valley residents. Local residents were replaced by soldiers housed east of Highway 99 W., at Camp Adair. Following the war, the residential population began to increase slowly until the 1970s, at which time growth accelerated rapidly, in relation to the construction of numerous housing projects in the area. Today, hundreds of people live in Soap Creek Valley (see Table D.4); most adults commute to work; most homes are on lots less than 10 acres in size; and most families are not directly associated with farming or forestry practices.

Table 17. Numbers and types of landowners, 1841-1990. This table summarizes information contained in Appendix D.

Landowner Type	1841	1853	1929	1990
Chapanafa Kalapuyan	27	0	0	0
Luckymute Kalapuyan	18	0	0	0
Family Farm (10+ acres)	0	27	57	72
Family Housing (1-9 acres)	0	0	0	226
Corporation	0	0	3	6
School	0	2	2	4
State	0	0	0	2
Federal	0	1	1	2

Landowner Type
1841 Taken from 1860 and 1888 census records (see Table D.1; Whitlow 1988)
1853 Taken from PLS GLO cadastral surveys (see Table D.2; Hathorn 1854a; 1854b)
1929 Taken from cadastral tsp. maps (see Table D.3; Metsker 1929a; 1929b; 1929c)
1990 Taken from Benton County Tax Assessor's Office records, 1990 (see Table D.4).

Military and Industrial Development (1890-1999)

Industrial development started in Soap Creek Valley with establishment of a few minor rock quarries in pioneer times; perhaps in conjunction with creation of a dry goods store or boarding houses associated with the town of Tampico (see Figs. 27 and 28; Maps 2 and 14), its school, post office, and/or race track (Zybach and Meranda 1989; Glender 1994). At least one blacksmith shop dated to this pioneer time (Elder 1853). Sawmills in the late 1880s or early 1890s were the first discrete industry to locate in The Valley (Wisner 1992), although their existence was short-lived and they were abandoned by the early 1900s (Longwood 1940; Olson 1994; Wisner 1998).

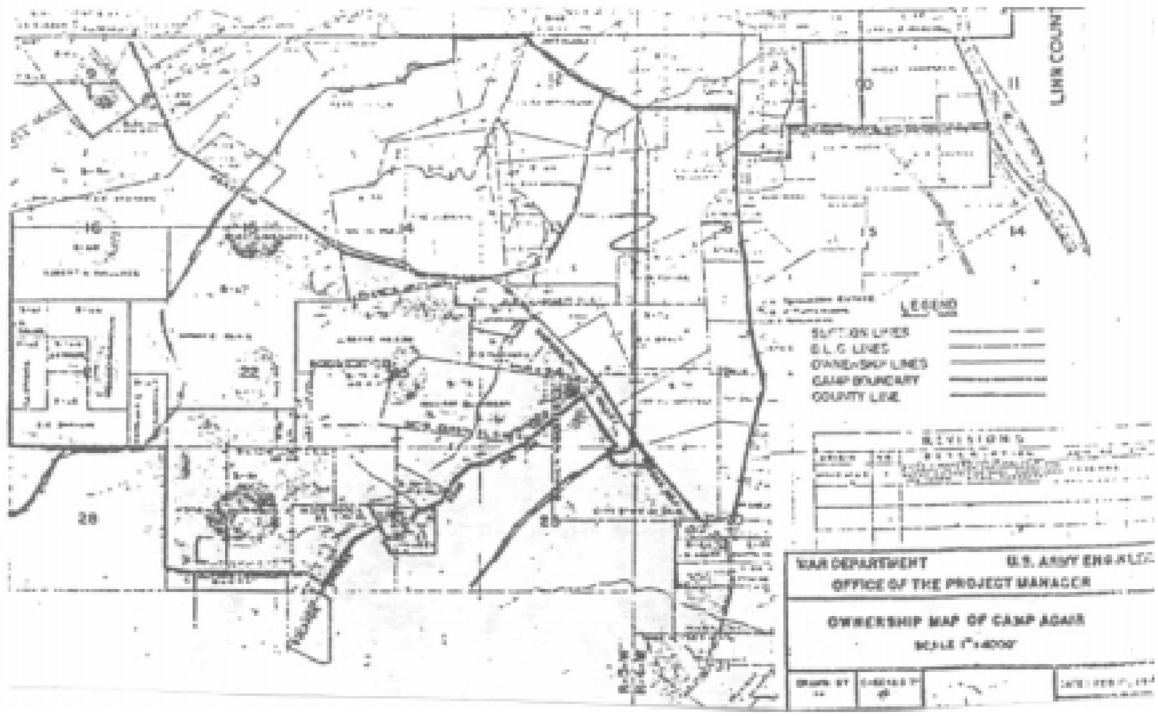
In the 1920s, at least three new sawmills were established in Soap Creek Valley (Fig. 27; Map 15; Rohner 1993; Glender 1994; Hindes 1996), but the Depression of the 1930s spelled an end to these enterprises as well. The creation of Camp Adair in 1941 led to the immediate use of Coffin Butte as a rock quarry for the construction of new roads and other military needs (Figs. 28, 30, 31, and 32; Maps 16 and 17; Rohner 1993). The remainder of The Valley was used for military field training purposes (Map 17; Berg 1983; Dunn 1990; Polk County Museum Association 1993; Rohner 1993). Following WW II, Coffin Butte continued to be used as a quarry, a capacity that has continue to the present time (Figs. 32 and 33; Rohner 1993; Webber 1996: personal communication; personal observation).

In addition to its use as a quarry, Coffin Butte has become a major landfill, a use which is currently altering its profile dramatically (Figs. 32, 33, and 34; Map 3; Table D.4; Westlund 1993; personal observations). The story of Coffin Butte, from pioneer rock quarry and landmark (Fig. 30), to military rock quarry (Fig. 32), to public landfill (Figs. 33 and 34), probably summarizes the majority of Soap Creek Valley's industrial development. The only other major industry that can be considered active in Soap Creek Valley at this time is the residential development industry, but its various interrelated businesses are located primarily in nearby cities and communities; i.e., little evidence exists of local construction or real estate development businesses based in Soap Creek Valley.

Map 16. US Army purchase of Soap Creek Valley lands, 1941. In anticipation of US involvement in WW II, most Soap Creek Valley land was purchased by the US Army for military training purposes. This process created the largest amount of federal ownership in Soap Creek Valley history, and the largest single block of land ownership in The Valley since presettlement time (annotated detail; US Army Engineers 1941).

Map 17. Camp Adair artillery ranges in Soap Creek Valley, c.1945. Data from this map was first published in 1993 (Polk County Museum Association 1993). It was based on an original hand annotated map discovered in The Valley Library Map Room earlier that year (Jones 1993; Loew 1993).

Map 16.


LINN COUNTY
LEGEND
SECTION LINES
D.L.C. LINES
OWNERSHIP LINES
CAMP BOUNDARY
COUNTY LINE
REVISIONS
WAR DEPARTMENT
OFFICE OF THE PROJECT MANAGER
OWNERSHIP MAP OF CAMP ADAIR

Map 17.

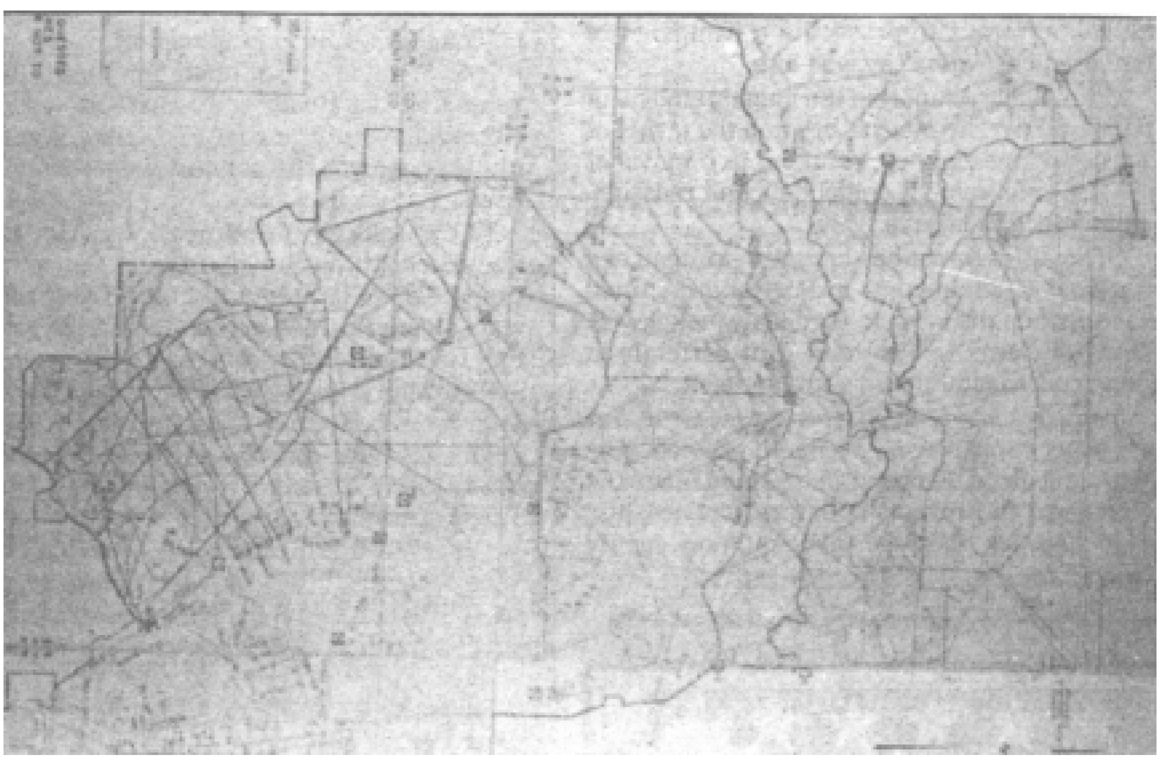


Fig. 31. Camp Adair traces, 1972. Photo shows eastern entry to Soap Creek Valley via Highway 99 W (visible as a straight line through center of photo, top to bottom) and Tampico Road turnoff (see Map 2). Note relict Camp Adair development to northeast, and Adair Village to southeast of Highway 99 W. Also note afforestation and housing development to south and west of Tampico Ridge (see Map 2), extending northward between Tampico Road and Highway 99 W. Photograph commissioned by OSU.

Transportation and Communications Systems (1500-1999).

The transportation development history of Soap Creek Valley closely parallels other agricultural areas of western Oregon that are not adjacent to steamboat landings or connected to railroad lines. Foot trails and canoe routes used by local Kalapuyan families (Zybach et al., 1990) were supplanted by horse

Fig. 32. Coffin Butte rock quarry and landfill panoramas, 1941-1997.
Top Photograph. Panorama made of two “unauthorized” photographs of US Army quarry operations taken during WW II by Wilma Rohner. Photos were made with Kodak Brownie camera she received on her 16th birthday (Rohner 1993). Rock from the quarry was used to build extensive road system throughout Camp Adair training area, including Soap Creek Valley artillery ranges (Berg 1983; see Map 17).
Bottom Photograph. Panorama made with four 35 mm. photographs. Coffin Butte landfill operations can be seen in the right foreground of the quarry in 1997. The addition of the major landfill operation has dramatically changed the local topography (see Maps 3 and 5) in the past 10 years (Westlund 1993). Photographs by author.

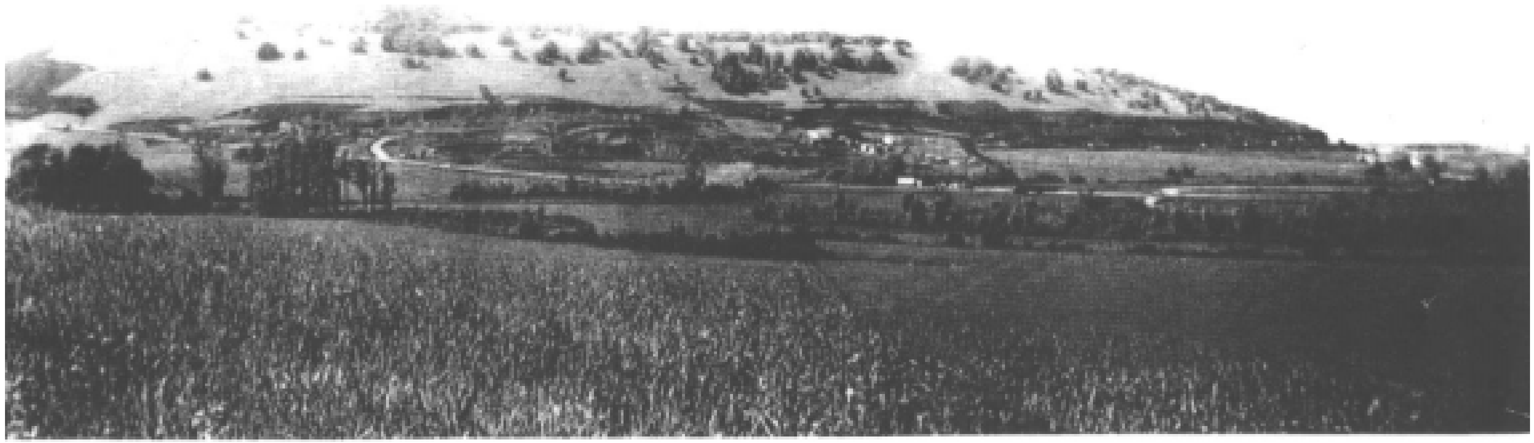


Fig 33. Coffin Butte southern slope, 1998. Aerial photograph of Coffin Butte shows extent of recent quarry and landfill operations. Compare with Figs. 30 and 32. Photograph and annotations courtesy of Brian Stone, Valley Landfills, Inc.

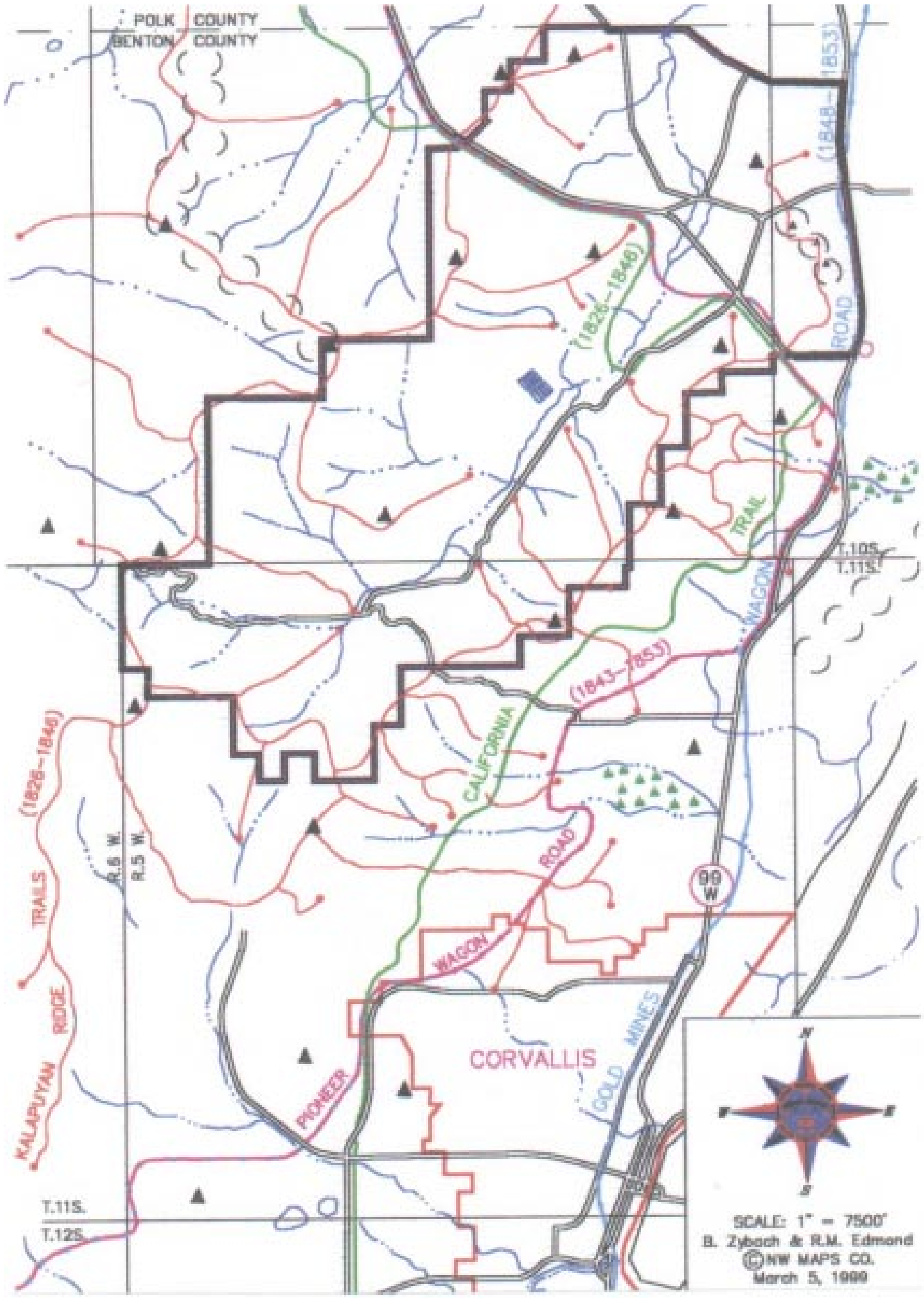
Fig. 34 Coffin Butte landfill, June 12, 1999. Entryway to current landfill operations, near former location of Rohner farmhouse (see Map 9; Rohner 1993).

and livestock trails in the 1820s and 1830s (see Map 18; Douglas 1905; Davies 1961). American settlement and the California Gold Rush in the 1840s and 1850s led to the construction of a permanent network of wagon roads that persisted until the early 1900s (see Maps 12, 13, and 14; Figs. 17, 24, 27, 28, and 30; Olson 1994). Beginning in 1905, local dirt and plank wagon roads began to be replaced with paved and rocked surfaces for bicycles, buggies, and automobiles (Figs. 26 and 29; Murphy 1995). The road network was extended to the forested areas of Soap Creek Valley during the 1930s by CCC laborers (Nettleton 1956; Jackson 1980; Sekermestrovich 1990; Rowley 1996;) and connected The Valley's resources to the Oregon State Nursery and CCC Camp Arboretum (Zybach c. 1991) by truck transportation. Creation of Camp Adair in the 1940s led to additional road construction in the eastern and northern parts of The Valley (see Fig. 31; Dunn 1990; Polk County Museum Association 1993; Rohner 1993). For the most part, this is the same network that remains in use today, although numerous access routes have been added to service modern real estate developments (Grabe 1990; Blanchard 1995, personal communication; Rowley 1996).

Map 18 summarizes primary road and trail development between Soap Creek Valley and Corvallis during the 1826-1899 period. Compare to Map 13 to note principal changes between 1826 and 1851, and between 1851 and 1999. For the past 170 years, this network has served as a major segment in the north-south land route between the Columbia River Valley of Oregon and Washington and the Sacramento Valley of California. This map shows both the location and evolution of transportation routes between the present-day Corvallis bridge crossings of Marys River and Soap Creek Valley crossings of Soap Creek (Zybach et al. 1990; OSU College of Forestry Forest Planning Team 1993): from Kalapuyan foot trails (1788-1825); to beaver hunter and livestock pack trails (1826-1845); to wagon roads (1846-1914); to automobile highways (1915-1999).

The history of local land-based communications systems parallel the transportation routes: from the mail carrying stages of the 1840s and 1850s (Zybach and Meranda 1989); to the telegraph lines of the 1860s and 1880s (Jackson 1980); to the railroad stations of the 1880s and 1890s (Rawie 1994); to the telephone lines of the early 1900s that persist until today (Glender 1994). Of recent interest are the satellite transmissions of the 1970s and 1990s, and how they are used to transmit television signals and Internet communications to local

Map 18. Soap Creek Valley road and trail history, 1788-1999.



Soap Creek valley residents. Although this most recent history does not tie directly to forest cover patterns, it does have an interesting historical connection to the military communications system that was based at Camp Adair, just east of Soap Creek Valley, until the 1980s (see Fig. 31; Bill Webber 1998: personal communication).

Summary. This chapter has documented various ways in which catastrophic events, wildlife demographics, and people have affected change in Soap Creek forest cover patterns during the past 500 years— and documented to a lesser degree the past 15,000 years as well (see Chapter II). Most change has been in conjunction with human resource management activities: from the broadcast burning practices of local Kalapuyan families and their forebears, to the real estate development and waste management practices of today. Effects of catastrophic events and wildlife demographics to forest cover patterns during both prehistoric and historical times appear to be directly exacerbated or mitigated by human actions.

Chapter IV.
Theoretical Accounts of Forest Cover Change

There are strange things done in the midnight sun
By the men who moil for gold;
The Arctic trails have their secret tales
That would make your blood run cold;
The Northern Lights have seen queer sights,
But the queerest they ever did see
Was that night on the marge of Lake Lebarge
I cremated Sam McGee
—Robert Service

What did the forests of Soap Creek Valley look like before the arrival of people? When did The Valley's land area emerge from the depths of the ocean for the final time? When could The Valley first become recognizable as "a valley?" What species were present in its original forests? What species were present, in what numbers, and where, when The Valley was first visited by people? Were those first people preceded, or followed, by their own purposely-set fires?

These are the types of questions that can (and probably should) be asked in efforts to determine "initial conditions" (Giere 1979) of Soap Creek Valley forestlands, or to measure the relative impact of subsequent human actiities on The Valley's forest cover patterns. The possible answers to these questions lead to additional sets of queries, depending on which theories are used to develop reasonable results. This form of research is called "the method of multiple hypotheses" (Chamberlin 1965), and differs significantly from theses based on a single hypothetical question.

This chapter discusses the basic types of theories used to formulate questions and test findings for this study. Two models are constructed for these purposes. The first model is a map of possible forest conditions for Soap Creek Valley that might develop in the absence of human activity. It is used as a test of initial conditions for 1500 and for 1826, and to provide a relative measure of the historical effects of human actions in The Valley (Naveh & Lieberman 1994). The second model is a systems diagram of possible interrelationships that exist between human needs and values, human actions, and their potential impacts on local wildlife populations and habitat patterns. Both models are compared to cause-and-effect findings described in Chapter III and to cumulative effect findings described in Chapter V.

FOREST COVER TRENDS AND CONDITIONS

The condition of Soap Creek Valley forests can be described for a point in time, whereas trends describe prevailing changes in conditions over a period of time. Appendix D lists The Valley's landowners for points in time in 1841, 1853, 1929, and 1990. General trends for the period of time covered by these ownerships (1841 to 1990) include increasing numbers of full-time residents, decreasing sizes of individual ownerships, increasing numbers of residential structures, and so on. From these findings it is reasonable to surmise that even more homes will be constructed in Soap Creek Valley—on smaller parcels of land, for even more residents—in the forseeable future. In this manner, identifiable trends become useful for predicting possible future conditions, a basic precept of modern science. Because the future is unknown, however, all predictions are, by definition, theoretical. One test of a predictive theory is to simply wait for the future to develop and then match actual conditions with previously predicted results. If conditions are not the same, the theory must be wrong; conversely, if they are the same, then the theory may be—but is not necessarily—true. Another method of testing predictive theories, without waiting for the future to transpire, is to use them to predict past conditions, which can often be documented. Theories that accurately predict the past are likely more capable of predicting the future than theories that produce inaccurate or unlikely results. This section describes a number of theoretical methods for predicting forest cover patterns, both past and future, and compares results with past conditions of Soap Creek Valley documented in Chapter III.

Method of Multiple Hypotheses

A "working premise" among some (often self-described as "postmodernist," "social constructionist," "deconstructionist," and/or "poststructuralist") researchers today is that theoretical "conflict is good [because] complacency among academics perpetuates an intellectual status quo that serves only a privileged few" (Ray 1996). The principal aim of such researchers is to identify "questions" and "assumptions," rather than "answers" and "facts." This perspective is consistent with Chamberlin's (1965) "method of multiple working hypotheses," first developed over 100 years ago, in the 1880s.

In an article first published in 1890 (Chamberlin 1965), Chamberlin described three basic methods of conducting scientific research: 1) the method of the ruling theory, 2) the method of the working hypothesis, and 3) the method of multiple working hypotheses. These methods are still in use today. The first method, which can be described as "making the facts fit the theory," or "cooking" the results of one's findings, remains both in disrepute and in common practice. Examples of this approach can be found in many places, including current news media, instructional texts, legal courts, and even scientific journals. Individuals seeking equal time for teaching "creationist theory" as given to teaching evolution in public schools are good examples of "ruling theory" proponents (Goodman 1999). In order to explain the existence of dinosaur fossils, for instance, followers of "creationist science" have claimed that humans and dinosaurs must have coexisted at one time, or that the fossils were created at the same time as people (calculated to be 6005 BP by a 13th century church bishop), as a "test of men's faith in the existence of God." Most modern scientists seem to discount such claims, yet may adhere to their own pet theories and beliefs. The method of the working hypothesis, perhaps the scientific methodology most commonly used at this time, is based on first developing a single hypothesis and then attempting to determine whether it is true or false. Chamberlin (1965) notes:

> Conscientiously followed, the method of the working hypothesis is a marked improvement upon the method of the ruling theory; but it has its defects—defects which are perhaps best expressed by the ease with which the hypothesis becomes a controlling idea. To guard against this, the method of multiple hypotheses is urged. . . The effort is to bring up into view every rational explanation of new phenomena, and to develop every tangible hypothesis respecting their cause and history.

This description is consistent with current postmodernist methods, with their common focus on developing as wide an array of research questions and assumptions as practical (Ray 1996). Another difference between the method of the working hypothesis and the method of multiple hypotheses is that the former is often "proved," or disproven, through the use of statistics (requiring quantified findings), while the latter develops assumptions and questions based on the "weight of available evidence" (Botkin et al., 1993). This thesis employs the method of multiple hypotheses as its basic approach, as demonstrated by the series of questions that opens this chapter and by the identification of multiple causes of forest cover change documented in Chapter III,. Findings are both qualitative and quantitative, but results are based on subjective assessments of the total, and can be readily discounted or supported as existing information is augmented or reconsidered.

Possible Conditions of Prehistoric Forests

The beginning point for this thesis is 1500; a point in time preceding historical documentation of Soap Creek Valley forest cover patterns by more than three centuries, and preceding most documented eyewitness accounts of the same phenomena by more than four centuries. Because of this circumstance, descriptions of forest conditions for that time remain largely conjectural. Such descriptions are also necessarily based on the beliefs, biases, and assumptions of individuals that attempt to make them.

Prehistoric forest conditions in Oregon have been defined as "natural" by a number of regional scientists and governmental agencies (FEMAT 1993). This word is often used to describe conditions in environments without human presence (Kimmins 1987; Naveh & Lieberman 1993), but is also used to describe consitions in North America that preceded White exploration and settlement, or events outside human control and/or influence; e.g., lightning-caused fires, volcanic eruptions, or climate. Botkin (1992) lists three basic kinds of "natural" areas in the US: 1) as first viewed by Europeans; 2) as set aside to conserve specific species; and 3) as "truly isolated from direct human influences." The latter category presumes the existence of "direct human influences" for the first two conditions. In a later work, Botkin (1996) presents three possible types of prehistoric human influence on "natural" western Oregon forests (in this instance, he uses the definition "as first viewed by Europeans" to interpret the journals of Lewis and Clark during their visit to western Oregon in the Winter of 1805-06): 1) native forests were continuous and Indians "had essentially no impact" on them; 2) that, due to natural ("nonhuman," or "truly isolated from direct human influences") disturbances, forests were not continuous; still, Indians "had essentially no effect on such a forested region"; and 3) "natural (nonhuman) fire and storm damage were the rule and were dominant factors" that were merely "supplemented by the actions of the Indians." He then states a fourth, unnumbered, possibility (Botkin 1996):

> Some argue further that the forests of the Pacific Northwest as seen by Lewis and Clark were very much the product of intentional actions by the Indians, and that their character was primarily the result of Indian management, and that this management led to more open conditions than would have otherwise occurred.

We will use this latter description as "Botkin's fourth possible condition" when considering the affects of human and nonhuman disturbances on prehistoric Soap Creek Valley forests and forest cover patterns. Botkin's first possible condition—that biological processes and climatic events have very little long-term effect on forest cover patterns—is shown in Chapter III as not true for Soap Creek Valley. Available evidence can be used to consider Botkin's three remaining possibilities: that nonhuman processes and events affected prehistoric cover patterns, but that people were essentially inconsequential; that nonhuman processes and events affected forest cover patterns, and such effects were modified slightly by human actions; and that prehistoric people were the principal shapers of forest cover patterns.

Successional and Climax Forest Theories

Most current predictions of prehistoric forest conditions in the Pacific Northwest rely on climax theory models that depict forests as consistently and predictably evolving through a "successional" series of "seral stages" of "native" plant and animal "communities" toward a "steady-state," "old-growth," "non-declining, even-flow," "maximum potential age" condition (Franklin 1981; Kimmins 1987; Franklin & Dyrness c. 1988; Spies and Franklin 1988; Hunter 1990). Such predictions show a pattern for prehistoric and early historical western Oregon that features a "blanket" of conifer forest over most of the landscape that is characterized by large, old (even "ancient"), trees, mostly Douglas-fir (FEMAT 1993). This condition would be similar to the "potential" forest condition discussed in Chapter I, and is called a "climax" condition. The measurement of "potential" or "potential maximum age" vegetation, then, is a measure of forest conditions almost completely devoid of human influence or other disturbance. This condition is admittedly theoretical because: "True climax forests are rare, but examples of old-growth forests 400 to 700 years in age are common and allow us to draw some conclusions about climax species" (Franklin 1981). "Potential vegetation," by some definitions, is entirely theoretical as it represents "a conceptual abstraction and construction of vegetation that would become established if man suddenly disappeared" (Naveh & Lieberman 1994).

By using a climax theory predictive model, we might reasonably expect that—in the absence of people and their actions—Soap Creek Valley would be heavily forested with a multilayered canopy of large, old, hemlock and cedar trees, a few giant Douglas-fir trees and groves, numerous large snags, a few scattered openings with grasses, ferns, and young seedlings, and a substantial amount of coarse, woody debris ("CWD") on the forest floor, in Soap Creek, and in its tributaries.

Landscape Disturbance and Even-Aged Forest Theories

"Even-age," "disturbance," or "landscape disturbance" theories of forest development, in contrast to climax theories, use terms such as "association," "age-class," "resiliency," "dynamic," "opportunistic," "value," and "history" to describe forest evolution (Raup 1966; Stout 1981; 1994; Zybach 1996b). The basic idea of landscape disturbance theory is that the natural forest environment is dynamic, resilient, and unpredictable, and that large numbers of contiguous trees are routinely killed in short periods of time due to a wide variety of circumstances. Whether even-aged stands are a function of people "disturbing the vegetation" (Stout 1981), and/or of nonhuman "natural disturbances" (FEMAT 1993; Naveh & Lieberman 1994), the idea remains essentially the same: that, whether caused by fire, flood, wind, volcano, clearcut, plow, or other means, forests are periodically destroyed en masse, only to regenerate in opportunistic and even-aged response to their predecessor's destruction. This model is probably best described by Raup (Stout 1981), in which disturbed sites are repopulated by adjacent assemblages of "tolerant" plants and animals that have successfully adapted to local disturbance patterns. This form of species resiliency assumes long-term survival advantages from the types of catastrophic events, climate changes, freak weather events, disease outbreaks, and other natural and cultural disturbances that have characterized Soap Creek Valley forest history (see Chapter III). Raup states that a basic feature of North American forests is that they are either even-aged, or else "have one or more well-defined age classes in them" (Stout 1981). This conclusion is echoed by the observations of Pinchot (1987), Munger (1940), and Andrews & Cowlin (1940) in the Pacific Northwest.

Discussion. A basic difference between climax forest and landscape disturbance theories is the composition of vascular plant species that populate an area of forestland following a "stand replacement event." Climax theory predicts there will usually be a gradual shift of seral stages over time "from herbaceous plants to shrubs, then shade-intolerant trees, and then shade tolerant trees" (Hunter 1990). Disturbance theory assumes most of the trees that will grow to dominate a site are established almost immediately following a disturbance, and that the area can be generally characterized thereafter by the age of such trees (Stout 1981). As a result of this difference: 1) trees are likely to be much older in climax conditions than disturbed conditions, 2) there is less diversity of tree species in a disturbed conifer forest than in a climax conifer forest, and 3) only two or three major, even-aged tree canopies typically characterize a disturbed forest, compared to "multiple layers" of all ages in a climax forest.

Systematic Theories of Events, Cycles, and Periods

Forests can also be viewed systematically; as open biological systems of interdependent parts that interrelate in recognizable patterns over time (Naveh & Lieberman 1994). Such systems can be viewed episodically, to illustrate how people and wildlife respond to catastrophic events and other disturbances; cyclically, to illustrate the tendency of living systems toward equilibrium and a return to former conditions over time; and periodically, to illustrate how identified components interrelate over a given length of time (Hansen 1961; Naveh & Lieberman 1994). Systems are typically conceptual in nature and have predictive limitations for artificially bounded areas, such as Soap Creek Valley. Another problem with systems is in the conceptualization process itself, where

Bertalanffy has warned that “a purely technological and mechanistic systems approach” may lead “to further dehumanization and making human beings even more into replaceable units” (Naveh & Lieberman 1994).

FORESTS WITHOUT PEOPLE

How do human activities compare to other types of disturbances affecting Soap Creek Valley forest cover patterns? Initial comparisons support the contention that human actions have had a greater impact on local forest conditions than either catastrophic events or wildlife demographics (see Chapter III; Raup 1966; Stout 1981; 1994; Zybach 1988; 1994b; Anderson 1993; Peterson 1994). In order to measure the relative effects of human activities on Soap Creek Valley forestlands, it can be helpful to consider what the forest might be like if it were not subjected to any human influences at all (Naveh & Lieberman 1994). Such a consideration, when compared to actual forest conditions, is also a good test of Botkin’s first and second possible conditions of prehistoric Soap Creek Valley forests (Botkin 1996), which assume little or no human impacts on natural conditions. Map 19 was constructed by using basic tenets of climax forest theory (FEMAT 1993) in conjunction with current potential vegetation theory (Naveh & Lieberman 1994), but with the supposition that people have not been present in, or had an impact on, Soap Creek Valley forests for the entire 500-year period of this study.

Predictive Assumptions for Soap Creek Valley Forests

As described in Chapter I, Soap Creek Valley is one of the most protected areas in the Willamette Valley, the Oregon Coast Range, and the Douglas-fir Region. It is buttressed from fire and high winds on all sides by thick ridges of basalt reaching heights over 2000 feet above the surface and floodplains of the Willamette River, and is isolated from other forests and large fuel build-ups by Kings Valley on the east, the Luckiamute Valley to the north, the greater Willamette Valley to the east, and the Marys River basin to the south. All adjacent drainages are characterized by long flat stretches of wet soils and low-growing plants within close proximity to Soap Creek. The forests of Soap Creek Valley are also isolated from major urban populations and primary transportation corridors and, until recent years, had a relatively modest number of human inhabitants. It would seem likely that these combined environmental conditions should create a greater likelihood of developing old-growth or "ancient forest" conditions when compared to other areas of western Oregon; particularly other eastern-slope sub-basins of the central Oregon Coast Range. In other words, forested areas in northwest Oregon that have greater numbers of human residents or visitors, that are regularly subjected to catastrophic flooding and landslides, and/or have more exposure to high winds and periodic lightning storms, would seem more likely to have fewer and/or younger trees than Soap Creek Valley forests.

For the purposes of this analysis, Map 19 has been made with little consideration of tree ages, vertical forest structure (canopy layers), or wildlife diversity. Those topics will be more thoroughly considered in Chapters V and VI.

<u>Climate, 1788-1999</u>. Map 19 has been constructed with the assumption that Soap Creek Valley seasonal and long-term climate for the past 212 years is within the "normal range of variation" (FEMAT 1993). The Willamette Valley has one of the lowest rates of lightning strikes in the US; according to Morris, they are "rare over most of western Oregon" (Boyd 1986). Virtually all of the historic "Great Fires" and historical prairie fires of great magnitude in western Oregon can be traced to sources of known, or greatly suspected, human ignition, rather than lightning (Morris 1934; Pyne 1982; Zybach 1988). Seasonal patterns of rain, occasional snowstorms, windstorms, and drought, are discussed in Chapter III. It is assumed they have affected Soap Creek Valley's "potential" forest cover patterns to some degree.

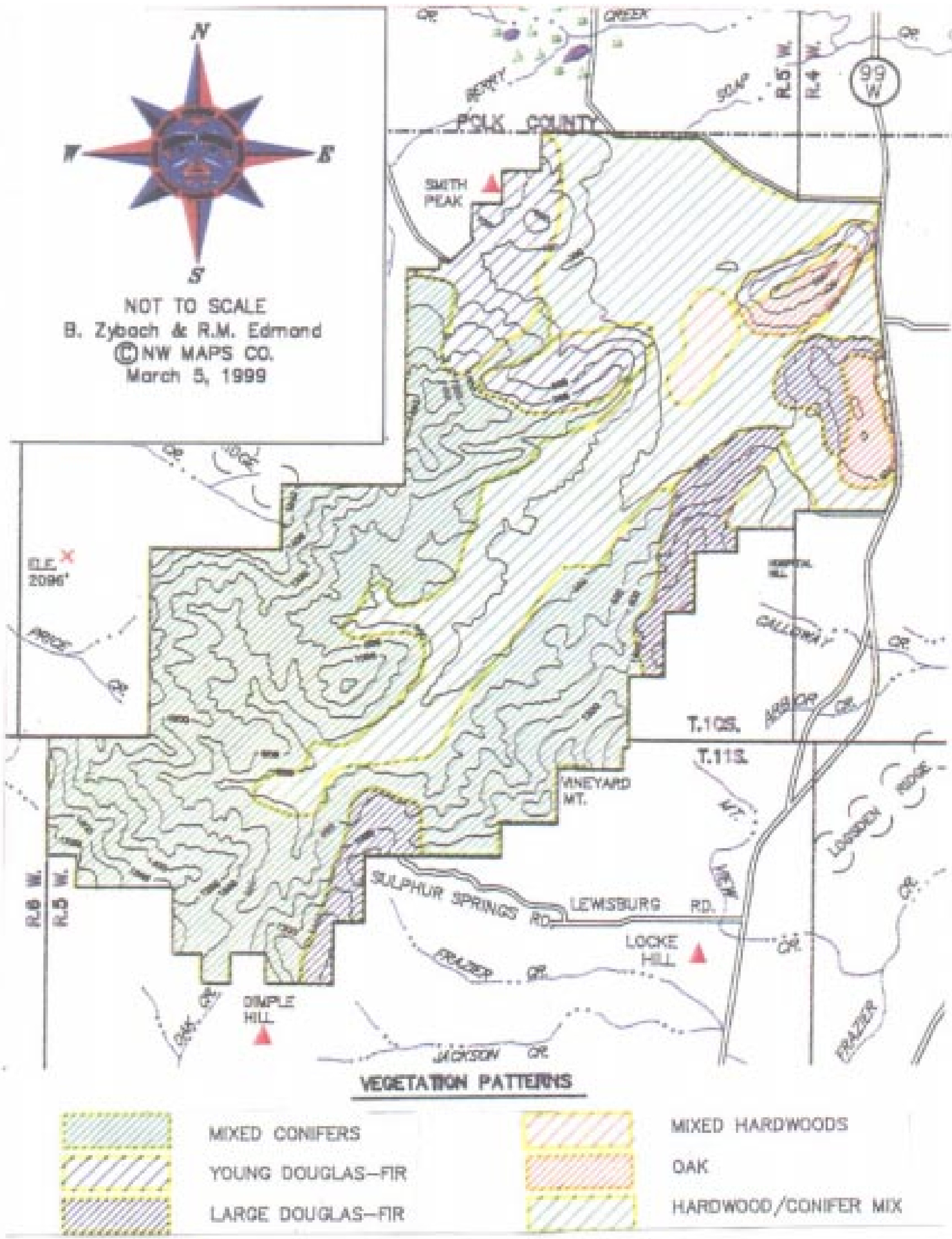
<u>Catastrophic Events, 1788-1999</u>. Most definitions of "catastrophic" all but fail to exist in Soap Creek Valley without considering human fire, plagues, and property losses. The term catastrophic event, then, is particularly suited for measuring forest cover change in terms of human values, rather than by other standards. For the purposes of constructing Map 19, however, winds and snowstorms of the past few centuries (and a few lightning-caused fires) will be considered normal, and somewhat regular, events for Soap Creek Valley.

Wild Animals, 1805-1845. As discussed in Chapter III, many animals, including honeybees, elephants (Fig. 11), ungulates, and beavers (Fig. 15), are capable of dramatically changing forest cover patterns. Archaeological evidence of extinct animals that have been butchered and/or cooked by people is a major indication of Paleoindian cultures (those that existed thousands of years ago; see Fig. 3). For the purposes of this analysis, it was assumed that extinct ice age animals would have "naturally" died out anyway, without influence of human contact. Local wild animals are presumed to be the same, or similar species, as existed shortly before European settlement. However, this latter assumption, with or without considerations of human-caused extinctions, is unlikely and probably impossible. For example, the c.1800 whitetail deer populations in the Willamette Valley were likely dependent on Kalapuyan burning to maintain desirable habitat. When domestic animals and white farmers became established in the Willamette Valley, whitetail deer were eliminated almost immediately (Longwood 1940; Storm 1941); the local deer population has been almost entirely blacktail since the 1870s or 1880s. Other ungulates and prairie animals, including butterflies, songbirds, rodents, and raptors, would also have reduced numbers or difficult survival chances with conversion of most grasslands to conifer forests; an assumed condition in the absence of people and their fires.

Dominant Tree Species, 1500-1845. The principal forest tree species are assumed to be the same as first surveyed in the 1850s (see Appendices E, F, and G; Tables 14 and 15). For conifers, principal species would be Douglas-fir, grand fir, western hemlock, and western redcedar. Hardwoods species include be Oregon white oak, bigleaf maple, red alder, Oregon ash, and black cottonwood (see Tables E.3 and F.1).

Understory Vegetation, 1826-1859. Shrub and grass species are assumed to be the same as existed before possible introduction of European grasses in 1826, and as first surveyed in the 1850s (see Appendices E, F, and G). For conifers, understory trees included western yew, hemlock and "pine" (possibly grand fir). For hardwoods, understory species included madrone, dogwood, chittum, choke cherry, Indian plum, ferns, and vine maple. Prairie plants include bunchgrasses, camas, tarweed, blackberries, and strawberries. For wetlands, camas, onions, sedges, rushes, and skunk cabbage are assumed to be native (see Tables E.3 and F.2).

Map 19. Soap Creek Valley "potential" forest cover pattern. This speculative pattern, constructed with a basic assumption of no human influence or occupation, can also be labeled "climax forest" or "naturally functioning ecosystem," among other terms in current use. It is representative of Botkin's first and second possible forest conditions (Botkin 1996) for the 1500 and 1826 times of initial conditions for this study (Giere 1979).



Map 19 was constructed using the theories and assumptions described above, combined with data summarized in Chapter III, and with my own knowledge and experience. The following sections describe specific portions of Map 19, as listed on the map's legend:

Oak and Grass: Fire and East Wind History

Oak savannah and grassy prairie lands in the Willamette Valley were maintained by Kalapuyan broadcast burning practices from earliest historical time until the 1850s (see Figs. 5 and 6; Boyd 1986). This practice may have terminated somewhat sooner in Soap Creek Valley, due to its settlement by livestock owners in the mid-1840s. The elimination of Indian burning in the mid-1800s, followed by reduced livestock grazing in the early 1900s, resulted in the rapid and steady afforestation of Soap Creek Valley prairies and meadows by oak and Douglas-fir (Fig. 21). In the absence of human intervention, it is quite possible that oak trees would all but disappear in Soap Creek Valley through successional processes shown in Figs. 17, 20, 21 and 22. Occasional lightning fires, either caused by direct hits to Soap Creek Valley, or brought in by easterly winds from the north, might provide sufficient clearing for some grassy plants and prairie animals; in such an instance, oak refugia would most likely be in the shallow, warm, dry, and exposed southern slopes of Coffin Butte and Tampico Ridge (see Map 2; Table 2). In time, even these areas would seem threatened by conifer shading between lightning fire events (Lord 1939; Sprague & Hansen 1946).

Douglas-fir: Fire and South Wind History

Douglas-fir typically exists in relatively pure, even-age stands and groves of trees (Andrews & Cowlin 1940; Munger 1940). Without human intervention, Douglas-fir depends on periodic stand replacement fires, windstorms, or volcanic eruptions for regeneration. Without these events, Douglas-fir canopies tend to break apart into openings that develop one or more age classes of such understory species as redcedar, western hemlock, grand fir, yew, bigleaf maple, and alder; i.e., mixed conifer conditions (Kimmins 1987).

The Columbus Day Storm of 1962 blew down several areas of trees; sufficiently large in size to regenerate naturally to Douglas-fir (Lord 1939), given the right conditions of seed, sunlight, and moisture (Munger 1940; Kummel, Rindt, & Munger 1944; Isaac 1949). In the undocumented assumption that such storms arrive from the south every century or two, the areas marked "large Douglas-fir" represent the possibility of maintaining stands through periodic windstorms and occasional lightning fires. The area marked "young Douglas-fir" represent the greater likelihood of stand replacement fire coming in from the northeast on an east wind, rather than from the south or from some other direction. Persistence of Douglas-fir seed trees in older, mixed conifer stands is due to age and size potentials. Subsequent to stand replacement fire, landslide, and/or hurricane events, the taller, older Douglas-fir are best able to cast their seed the furthest distances (Kummel et al., 1944; Isaac 1949).

Mixed Hardwoods: Fire and Flood History

The marshy, occasionally flooded ground north and west of Coffin Butte (Glender 1994) featured almost pure ash and camas stands in the early 1840s and 1850s (Elder 1853). Annual and other periodic flooding may be sufficient to eliminate most competition from conifers (see Fig. 20) within the area marked "mixed hardwoods." Better drained soils, with some alluvial flooding from tributary channels, might contain significant stands of Douglas-fir, redcedar, grand fir, and even western hemlock, in addition to bigleaf maple, willow, crabapple, choke cherry, Indian plum, cottonwood, alder, and possibly chittum. Fire would most likely enter this area from the northeast, on an east wind. Beaver activity would likely be greatest in this area, as would concentrations of bear, deer, rodent, raptor, reptile, and amphibian populations (Storm 1941; Sondenaa 1989: personal communication).

Mixed Conifers: Fire and Landslide History

Areas of mixed conifer are among the most protected in Soap Creek Valley (see Map 5), and therefore more likely to develop old trees and climax forest conditions. Trees are protected from western and southern windstorms by perpendicular ridges, from east wind-borne fires by the lack of nonhuman sources of ignition, from floods by elevation and slope, and from excessive solar radiation by the shadows cast from steep draws and east-west ridgelines. In fact, these portions of Soap Creek Valley appear to be among the most protected areas from nonhuman disturbances in the Willamette Valley (personal observation). Long-lived drought-resistant conifers would likely dominate the overstory of these areas, with Douglas-fir and grand fir being the most prevalent. Cedar would likely be present in many areas, and an understory of yew would also persist. Most hardwoods would be shaded out by larger and faster growing conifers over time, and overstory seed sources would tend to regenerate disturbed areas. There is a decided lack of hemlock in Soap Creek Valley at this time (personal observation), but reliable accounts exist of a large stand of these trees being present in the southeastern part of the basin in the early part of the century (Olson 1994; Rowley 1998: personal communication).

Summary. A secondary objective of this thesis is to provide a graphic depiction of the definition for "forestland" in Chapter I. Map 19 provides a basis for measuring human influence on Soap Creek Valley forest cover patterns and reflects (with the exclusion of direct human influences) known and assumed conditions in Soap Creek Valley during the past 500 years. Chapter V contains several forest cover maps based on documented historical conditions for specific points in time that are similar in scale and format to Map 19. Thus, relatively accurate and detailed comparisons can be made between theoretical "climax forest" conditions and those in which human activities take place.

FOREST PRODUCTS AND WILDLIFE HABITAT

This section provides a basis for considering Botkin's (1996) third and fourth possible conditions of prehistoric Soap Creek Valley forest cover patterns. (For the purposes of this thesis, the terms "forest cover patterns" (see Chapter I) and "wildlife habitat patterns" are used interchangeabley.) Discussion includes consideration that forest cover patterns reflect, to some degree, the values and technologies of local people who inhabit them and the possibility that wildlife habitat patterns (including locations, varieties and populations of wild plants and animals) are a partial function of human forest management objectives.

Changes in Forest Product Uses and Values

Human activities have been primary shapers of vegetation cover patterns in Soap Creek Valley for over 150 years (see Chapter III), and likely for as many years as people used The Valley before then (Pyne 1983; Kay 1995). Historical activities have been largely driven by local subsistence needs (e.g., food harvesting and processing, and firewood gathering), changing cultural values (e.g., log manufacturing, livestock grazing, homesite development, and community waste disposal), and external events (e.g., epidemic diseases, human migration, and international war). The degree and methods of human-based effects on Soap Creek Valley forest cover patterns have been largely regulated by the number and cultural practices of human occupants at a given time, available technologies (e.g., prescribed fire, tractors, and chain saws), and regional market conditions (e.g., edible roots, mammal furs, feathers, livestock, agricultural crops, and homes). It is assumed that overt human changes to Soap Creek Valley forest cover patterns include changes in local forest product uses and harvests.

Primary forest products extracted from Soap Creek Valley forests during the past 500 years are listed in Table 18. In general, product use is in accord with local survival strategies: prehistoric cultures derived a broader range of products needed for day-to-day survival (water, food, fuel, and shelter), and post-settlement cultures focused more on year round habitation (e.g., houses, fences and pastures) and regional markets (e.g., pulp and logs). Changes in technology also influenced local product use and manufacture. Examples include the change from stone tools to metal tools that corresponded to the introduction of European trade items in the early 1800s and directly affected local beaver, elk, condor, bear, wolf, and whitetail deer populations (Storm 1941); the change from firewood to fossil fuels and electricity for heat and cooking during WW II that directly affected the amounts of dead wood found in forested areas adjacent to Soap Creek Valley homes and roads (see Fig. 21); and the more recent discovery of medicinal value of yew for treating cancer that resulted in local policy restrictions on the harvest of that species (OSU College of Forestry Forest Planning Team 1993).

<ins>Summary</ins>. Uses and values associated with forest products are not direct causes of change to forest cover patterns in Soap Creek Valley. Rather, they are

drivers that stimulate and define human activities which, in turn, influence forest structure, composition, and extent (Raup 1966; Stout 1981; Zybach 1994b). If, when, where, and to what degree such activities have taken place in Soap Creek Valley has been the result of many factors, mostly unpredictable (Gleick 1987; Naveh & Lieberman 1994). In general, the needs and values of Soap Creek Valley residents and visitors, combined with external demands for surplus Soap Creek Valley forest products and factored by available labor and technologies (including communications), have formed a significant basis for altering and/or maintaining local forest cover patterns (see Chapter III). Opportunities and limitations provided by wildlife demographics, by the effects of catastrophic events, and/or by other conditions and circumstances, add definition to the processes of managing local forestlands for human products. Forest cover patterns of Soap Creek Valley can be interpreted as a direct reflection of local human populations, needs, and values, no matter what point in time is considered (Raup 1966).

Forest Product Values and Forest Cover Changes

The interrelationship of human populations, forest product extraction, and forest cover patterns can be viewed systematically. This type of condition can be termed a "symbiotic relationship," and is based on "structural-functional theory." Put simply, this theory "implies a relationship between two factors that is believed essential for the continuance of each and to the structure that contains them" (Schvanaveldt et al., 1993). Fig. 35 is a systems diagram that can be used to illustrate the structural-functional relationship between people and forest cover patterns in Soap Creek Valley. For example, Fig. 35 shows how information about local resources that exists in a number of forms on several scales can be transformed into local human actions that directly alter biological forest cover patterns. The cornerstone of the diagram is common human need for forest products, including fuel, food, water, and oxygen (see Table 18). On a strict subsistence level (an almost purely theoretical condition that has probably rarely, if ever, occurred in Soap Creek Valley), survival is "every man for himself." In this condition, basic products are identified and used almost exclusively for the immediate needs of individual survivors. In more complex social circumstances (such as characterize most human history and prehistory), the identification, harvest, manufacture, storage, and trade of products also becomes more complex.

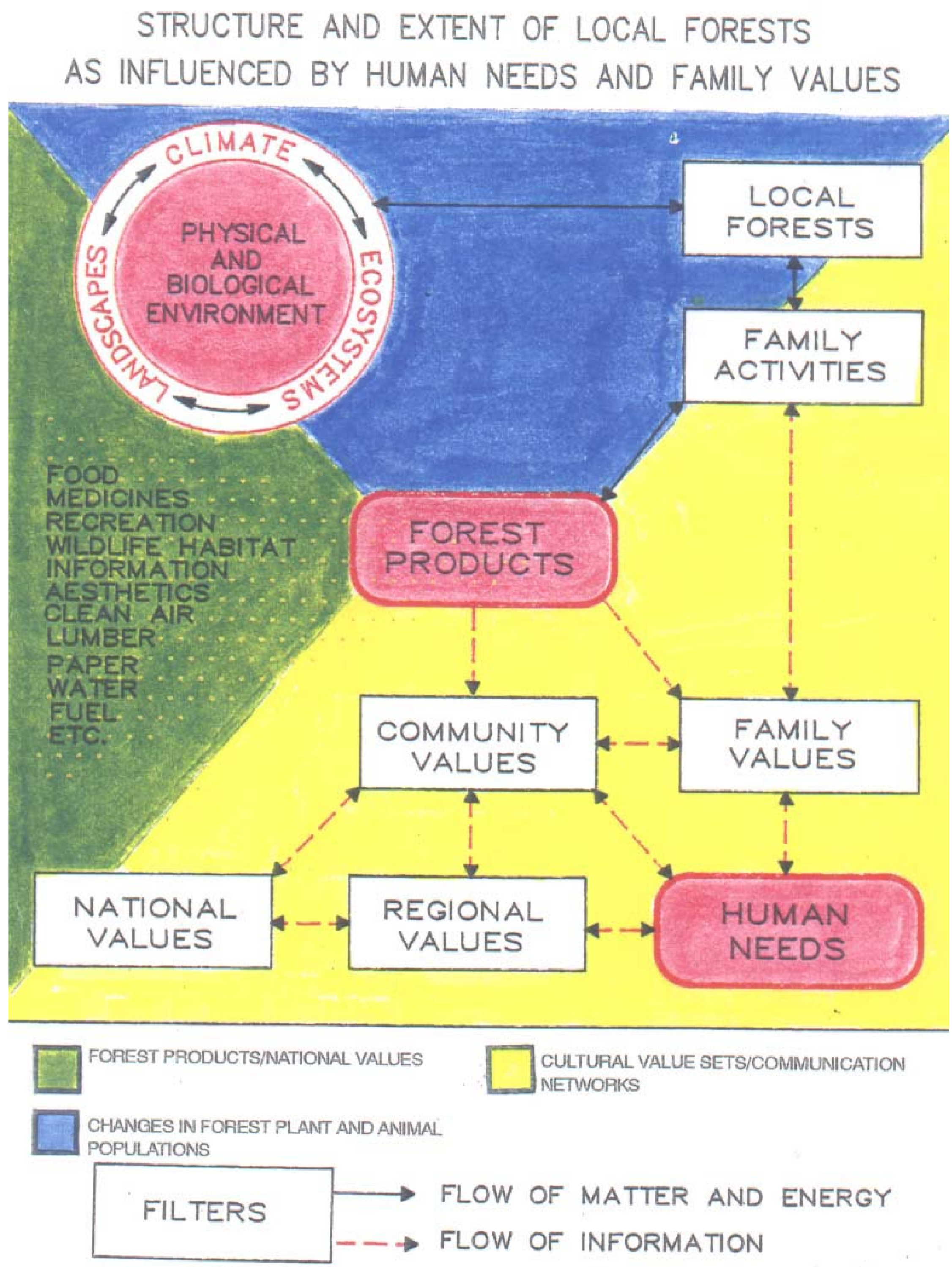
Table 18. Primary Soap Creek Valley forest products, 1500-1999.

	Forest Products	Kalapuyan	Pioneer	Modern	Total
		KALAPUYAN			
1.	Dyes	1500-1855			356
2.	Tools	1500-1855			356
3.	Weaving materials	1500-1855			356
		ALL			
4.	Firewood	1500-1855	1846-1899	1900-1941	442
5.	Food	1500-1855	1846-1899	1900-1915	416
6.	Lumber and poles	1500-1855	1846-1899	1900-1999	500
7.	Medicine	1500-1855	1846-1899	1980-1993	414
8.	Recreation and aesthetics	1500-1855	1846-1899	1900-1999	500
9.	Rock	1500-1855	1846-1899	1900-1999	500
10.	Waste disposal	1500-1855	1846-1899	1900-1999	500
11.	Water	1500-1885	1846-1899	1900-1999	500
		PIONEER & MODERN			
12.	Fence posts		1846-1899	1900-1940	95
13.	Fields and pasture		1846-1899	1900-1941	96
14.	Logs		1890-1899	1900-1999	110
15.	Rural residences		1846-1899	1900-1999	155
		MODERN			
16.	Pulp and chips			1930-1999	70
17.	Urban residences			1966-1999	35

Kalapuyan — Assumes prehistoric residents were Kalapuyan, or used similar products.
Pioneer — Begins with first log homes, fences, and wagon roads in 1846.
Modern — 20th century advent of electricity, automobiles, telephones, and TV.
Total — Number of years used in Soap Creek Valley during past five centuries. This measure provides some idea as to the cumulative effects the harvesting of specific types of products might have over time.

Activities are driven partly by individual need, but also by family and community values, local markets, regional laws, and national policies (Raup 1966; Stout 1981). Combinations of these cultural influences, existing almost solely as information, become key determinants as to what actions, if any, will be taken in Soap Creek Valley forestlands by local family members during the day, week, month, and/or year (see Fig. 35). Because values change (and assuming basic needs are fairly constant, or at least are directly related to the age, gender, and number of people in Soap Creek Valley at a given point in time), human activities are likely to change, in response, as well.

Fig. 35. Diagram of forest products/forest cover interrelationships. This diagram illustrates how local human needs, changing human values (Raup 1966; Stout 1981), and resultant forest product extractions (see Table 18) combine to alter the physical and biological environments of forested areas (Zybach 1994b), including Soap Creek Valley (Zybach 1993a).



Specific types of human activities, as described in Chapter III, have direct influences on local wild plant and animal populations (e.g., Figs. 14, 18, 19, 22, 25, 32, and 33), thereby altering local forest cover patterns. Fig. 35 shows how changed forest cover patterns can influence adjacent and regional environments, thereby potentially affecting climate, visible landscapes, and entire ecosystems. The scale of influence depends on the scale, amount, and type of change.

Summary. Information about human needs and values, in combination with local human populations, influences local levels of forest product use. Activities related to product harvesting, manufacture, storage, use, and/or trade have a direct effect on local forest cover patterns, thereby affecting other areas of the environment as well. This pattern reflects established interrelationships between human needs, cultural values, human communications, available technologies, climate, wildlife demographics, and wildlife habitat structures. The pattern is systematic, dynamic, and largely unpredictable, therefore, future conditions remain unpredictable as well.

Discussion. In general, both the weight of documentary and theoretical evidence support Botkin's fourth condition for prehistoric time; that the forests of Soap Creek Valley were "very much the product of intentional actions by the Indians, and that their character was primarily the result of Indian management, and that this management led to more open conditions than would have otherwise occurred" (Botkin 1996). The same assessment can be made for historical time, although the processes are better documented and the results are more apparent. This assessment is examined in greater detail in Chapter V.

Chapter V.
Chronological Account of Forest Cover Changes

> This countryside is not good now. Long, long ago it was good country. They were all Indians who lived in this countryside. Everything was good. No one labored. Only a man went hunting, he hunted all the time. Women always used to dig camas, and they gathered tarweed seeds. Such things were all we ate. They gathered acorns, they picked hazelnuts, they picked berries, they dried blackberries.
>
> —John B. Hudson, 1933

Most historical changes to Soap Creek Valley forest cover patterns can be characterized as resulting from the effects of human plague and subsequent reduction of broadcast burning by native Kalapuyan families, human influenced wildlife demographics, periodic catastrophic snowstorms (see Table 11), freezes, and windstorms, and value-driven human activities (see Chapters III and IV). This chapter places these combined events and processes into chronological order, from 1500 to the present. The chronology is divided into three primary sections: the "late prehistoric" period of time preceding written documentation (from 1500 until 1825), the "early historical" period preceding living memory (1826 to 1899), and the current period, in which oral histories add significant primary and secondary sources of data to our understanding of Soap Creek Valley forest cover patterns (the 20th century). Four forest cover maps are presented for the latter two periods: 1826 and 1853 patterns for the early historical period, and 1929 and 1945 patterns for the living memory period. These maps can be compared to Map 19, the theoretical "climax model" of "potential vegetation," compared to one another, and can be further analyzed through the use of GIS methodology, as illustrated by Maps 6 and 7.

This chronology places Soap Creek Valley events and activities in temporal context to one another and helps to identify resulting cumulative effects on The Valley's forest cover patterns. Another value is to aid in differentiating between the effects of incidental, periodic, and cyclic occurrences (Hansen 1961; 1967). Such determinations are helpful for predicting prehistoric and future conditions within The Valley's boundaries, for testing multiple hypotheses associated with this thesis (Chamberlin 1965), and for identifying interrelated cause-and-effect changes to local forest cover patterns.

PREHISTORIC CONDITIONS, 1500-1825

It is unknown how long Kalapuyan families lived in the Willamette Valley before their discovery by European Americans in 1806 (Thwaites 1959). However, technologies used by Kalapuyans during early historical time were employed locally for at least 9000 years to roast filberts (Friedel, Peterson, McDowell, & Connolly 1989), at least 5000 years to bake camas using bigleaf maple and Douglas-fir firewood (Reckendorf & Parsons 1966), and over 2000 years to hunt small game with bows and arrows (Aikens 1975). Thus, archaeological findings can provide certain insights into reconstructing prehistoric patterns of vegetation. The work of early ethnologists (Jacobs 1945; see Appendix H) adds to our understandings of late prehistoric and early historical cultural practices and subsistence strategies and how prehistoric peoples managed local landscapes (Snyder 1979; Boyd 1986; Gilsen 1989). Plant pollens (Hansen 1947; Heusser 1960), tree rings (Starker 1939; Bennet 1948; Nettleton 1956; Drew 1975; Graumlich 1987; Fritts & Shao 1995; Associated Press 1997), and persistent patterns of vegetation (Chapter III; Stout 1981; Zybach 1988; 1992a) are also useful tools for reconstructing prehistoric conditions, including forest cover patterns.

Perhaps the most easily recognized prehistoric forest cover patterns are those including old-growth trees (see Figs. 36 and 37; Table 19). Table 19 lists the largest and oldest Soap Creek Valley tree species on record and compares their sizes and ages to other areas in the Douglas-fir Region. Note that no Douglas-fir has been identified in Soap Creek Valley that existed before 1600 and no oak has been recorded that sprouted before 1550. Ages for Soap Creek Valley trees were determined by ring counts (Starker 1939; Rowley 1990; Zybach et al., 1990: personal communication; Johnson 1996: personal communication). Diameters were obtained from PLS survey notes (see Appendix F), early timber cruises (Bagley 1915), and OSU Research Forests inventory data (Nettleton 1956; Johnson 1996: personal communication). Note the great disparity in Douglas-fir and redcedar ages between local and regional measures, and the difference in diameters for all species. (The difference in diameter measures for bigleaf maple is possibly due to a typographical error, as 20-inch diameter specimens of this species are very common; older maples often attain a diameter of three feet or more).

Table 19. Extreme ages and diameters of wild tree species, 1853-1999.

	AGES			DIAMETERS		
Species	SCV	DFR	Difference	SCV	DFR	Difference
Douglas-fir	400	1,200	-800	84	170	-86
Grand fir	200	300	-100	40	80	-40
Redcedar	300	1,200	-900	48	250	-202
Hemlock	200	500	-300	40	100	-60
Maple	200	300	-100	48	20	+28
Cottonwood	100	200	-100	42	49	-7
Alder	100	100	0	30	30	0
Oak	450	500	-50	42	35	+7
Madrone	150	*	*	26	*	*
Yew	300	*	*	16	*	*
Ash	100	*	*	22	*	*

WFR Douglas-fir Region (Heilman, Anderson, & Baumgartner 1981; Zybach, Barrington, & Downey, 1995)
SCV Soap Creek Valley (see Map 2)
AGES Ages (in years) of species for SCV based on ring counts and estimates; for DFR based on Franklin (1981) and Franklin and Dyrness (c.1988).
DIAMETERS Diameter (in inches) of SCV species based on PLS and timber cruise data; for DFR based on Franklin (1981) and Franklin and Dyrness (c.1988).
* No measure available for DFR from either source used.
NOTE: Measures taken from Franklin (1981) are for “maximum” ages and diameters; for Franklin and Dyrness (c.1988), measures are those “typically attained” by species, with the qualification that “Maximum ages and sizes are generally much greater than those indicated here.” “Typical” DFR measures are given for grand fir, bigleaf maple, red alder, white oak, and black cottonwood, which are not listed in Franklin (1981).

The oldest Douglas-firs measured in Soap Creek Valley have been less than 400 years (Starker 1939; Nettleton 1956); about one half the age listed by Franklin (1981) as “typical” for the species and one third the age listed by Franklin and Dyrness (c.1988) as “maximum.” Also, there is little evidence of conifers in the entire Oregon Coast Range (including Soap Creek Valley) in excess of 600 years of age, much less 750 years or 1,200 years (Andrews & Cowlin 1940; Zybach 1988; Teensma, Rienstra, & Yeiter 1991). Douglas-fir ages of this magnitude have been recorded in isolated areas of the western Cascades (Teensma 1987; Associated Press 1997), Olympic Mountains (Henderson, Peter, Lesher, & Shaw 1989), and Vancouver Island, British Columbia (Henderson 1993: personal communication; Sandstrom 1996: personal communication), but are uncommon in those areas as well (Andrews & Cowlin 1940). Soap Creek Valley Douglas-fir and redcedar ages and sizes are within regional bounds described in eyewitness accounts by Leiberg (1900), Gannett (1902), Munger (1916), and Pinchot (1987), rather than the "typical" numbers listed by Franklin (1981).

Fig. 36. "Greg George Doug": old-growth Douglas-fir, 1989. OSU Forestry student, Greg George, stands next to namesake tree, at the time believed to be the largest Douglas-fir on OSU Research Forests property (see Map 4). This tree is located in Soap Creek Valley to the north of Lewisburg Saddle (see Map 2), and is likely more than 300 years of age, providing insight into local forest conditions for the past several centuries. (Photograph by author.)

Munger's (1916) description of tree ages for all of Washington and Oregon is consistent with findings for Soap Creek Valley: "Most of the so-called virgin stands are not over 350 or 400 years old, and trees over 600 years are quite uncommon."

1500-1625: Prehistoric Old-Growth

Alexander R. McLeod and David Douglas visited the Soap Creek Valley area in early October, 1826 (Davies 1961; Douglas 1905). Documentation of their travels described miles of barren plains burned clear of living vegetation by Kalapuyans, and occasional groves of oak and scattered "pine" (Douglas-fir) three and four feet in diameter on east slope Oregon Coast Range hills. Fig. 36 shows the largest Douglas-fir known in Soap Creek Valley. It is located near a group of trees dated to 1602 (Starker 1939), a five-foot diameter Douglas-fir measured in 1853 (Elder 1853), and a tree that contained ax marks dating to 1826 (Jackson 1980; Rowley 1997). A question is: Where are/were these trees'—which were of large second growth and young old-growth status when first described by Douglas and McLeod—parent seed sources located? No direct evidence exists for conifer in Soap Creek Valley earlier than 1600, yet such trees must have existed there, or very nearby (Kummel et al., 1947; Isaacs 1949). This question can be partly answered through examination of tree rings (see Fig. 37), timber cruises (see Map 11 and Table 14), and land surveys (see Chapter II; Appendix F).

However, the question remains: Where were the 1500-1600 era trees located that gave birth to these 1600-1800 stands of prehistoric second growth? And why are these trees so much smaller and younger than others of their species in the region (see Table 19)? Were the lands of Soap Creek Valley largely bereft of trees before these stands were created, or do remnant pockets of old-growth represent a relict population of a much larger stand that was deforested sometime in the late 16th or early 17th century? And, if the latter is true, why weren't relict stumps and snags of former forested areas noted by any 1820s explorers, 1840s pioneers, 1850s land surveyors, 1880s artists, or 1890s photographers?

Fig. 37. Old-growth logging stump, T. 11 S., R. 5 W., S. 6, 1990. Sometime around 1890, a regular practice of clearcut logging began in this section (Olson 1994), but the area and volume of large trees remained greatest for Soap Creek Valley (see Tables 14, 15, 20 and 21; Appendices F and G) until the entire stand was finally clearcut during and shortly after WW II (Sauerwein 1948; Jackson 1980; Rowley 1997). Section 6 also contains the only significant redcedar stand in Soap Creek Valley (see Appendix G; Garver 1996: personal communication), and was the probable location of the only large stand of western hemlock in The Valley (Olson 1994; Rowley 1998: personal communication). Prehistoric Soap Creek Valley families likely visited the stand for cedar and hemlock products, as partly evidenced by a relict meadow to the immediate north of the cedar grove (Bagley 1915). After the section was clearcut, its owners traded the land to OSU and it is now part of Paul M. Dunn Forest (Rowley 1997; see Map 3). Photograph by Kevin Sherer.

Most forested land in western Oregon can be defined in terms of even-aged stands of individual conifer species (Gannett 1902; Munger 1916; Andrews & Cowlin 1940). Forests are primarily Douglas-fir (Munger 1940), but also consist of even-aged stands of western hemlock (Silen 1989: personal communication), Sitka spruce (Vaughn c.1890), and other tree species native to Soap Creek Valley and the Douglas-fir Region (Leiberg 1900; Pinchot 1987; Rowley 1990: personal communication; Zybach 1994b). Many of these stands are extensive and individual age classes have existed for centuries, spread over hundreds of miles on a north-south axis covering tens and hundreds of thousands of acres (Franklin & Hemstrom 1981; Zybach 1988; Henderson 1990; Teensma et al., 1991). Other stands, including those in Soap Creek Valley, are isolated from the major timber belts of the western Cascades and Coast Ranges, yet retain the characteristic "even-aged" nature of the larger stands (Nettleton 1956; Rowley 1990: personal communication; Johnson 1991: personal communication; personal observation).

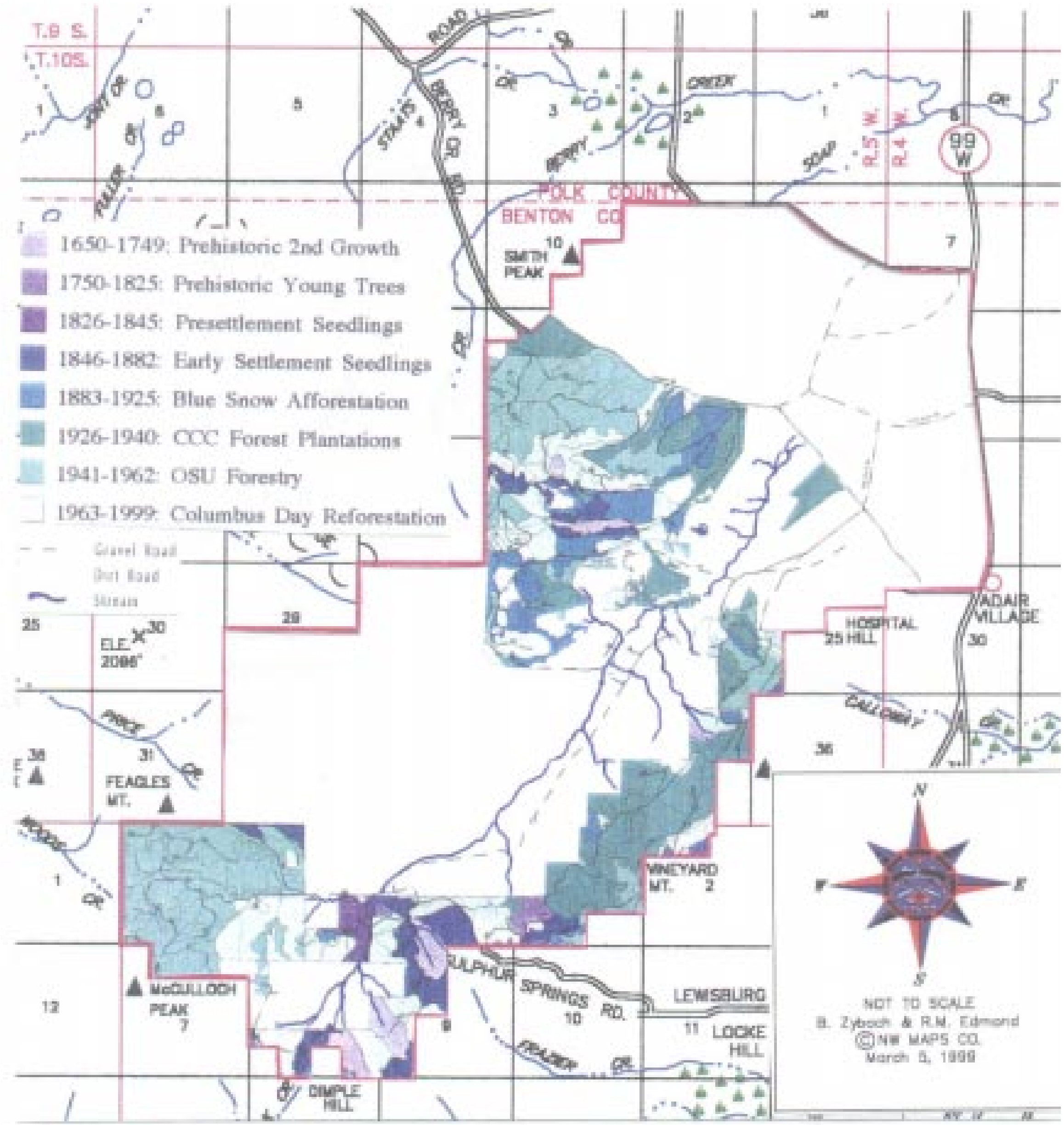
Ages of stands of OSU Research Forests' trees in 1990 within the study area are provided in Map 20. Note the relict stands of old-growth trees north of Writsmans Hill, north of Dimple Hill, east of Lewisburg Saddle (north of Vineyard Mountain), and along Bakers Creek (see Map 2 and Table 2). Also note the apparent outward expansion of the forest from these areas, as evidenced by a progressive reduction in age classes. Prehistoric even-aged stands are generally assumed to be products of catastrophic events; primarily fire (Franklin & Hemstrom 1981; Henderson 1993: personal communication; Pinchot 1987), wind (Starker 1939; Stout 1981; Henderson et al., 1989) or volcanic eruption (Sandstrom 1996: personal communication). Another possibility is that many of these prehistoric forests are a result of afforestation processes, similar to those that have seen the historical forests of Soap Creek Valley extend into adjacent savannah, meadows, and prairies (see Chapter III; Fig. 37). Map 20 illustrates the general rate of conifer afforestation in Soap Creek Valley that is documented temporally by Figs. 17, 18, 19, 20, 21, 22 and 38, and spatially by Figs. 26, 28, and 31 and by Map 12. This process appears to be representative of much of the Douglas-fir Region during the past 300 years or more (Zybach 1988), and may well have contributed to the establishment of older even-aged stands in the region (Andrews & Cowlin 1940; White 1995). If so, it is possible that the vast tracts of old-growth Douglas-fir encountered by pioneer Oregon lumber-men (MacCleery 1992) partly resulted from catastrophic losses of people rather than catastrophic losses of trees (Zybach 1988). This possibility raises important ethical and management questions for Douglas-fir Region land use planners, foresters, and wildlife specialists.

<u>Discussion</u>. What were Soap Creek Valley forest conditions in 1500, the initial point of this study (see Chapter IV)? There is little evidence of forest trees in Soap Creek Valley before 1550 (Nettleton 1956), and there is no evidence of

Fig. 38. Forest Peak prairie afforestation, 1991. Grassy prairies and meadows of Soap Creek Valley, dating to prehistoric times, have been incidentally and systematically afforested during the past 175 years. Alistar Zybach, 13-years old at the time of this photograph, gives size and structural perspective to planted and seeded Douglas-fir. These trees are beginning to displace perennial herbs and grasses in a portion of relict prairie visible in Figs. 16 and 21. Photograph by author.

major deforestation preceding their establishment. At that time, scattered oak trees and groves began growing over a wide portion of The Valley; followed in 50 years by the establishment of several stands of Douglas-fir in Soap Creek headwaters (see Sprague and Hanson 1946). It is unlikely the oak could have become so widespread if the previous forestland condition was Douglas-fir or grass, unless human intervention took place. Two conclusions are possible: 1) a 1500-era oak forest or savannah was completely destroyed by fire, wind, and/or

Map 20. OSU Research Forests' conifer stand ages, 1650-1992. A breakdown of Soap Creek Valley timber stand age classes by cultural markers (see Chapter II; Appendix C; Table 6) shows distinct patterns of afforestation and reforestation, as illustrated by this map of OSU Research Forests lands. The spread of Douglas-fir from a few isolated mid-1600s patches and steep headwater stands (see Tables 20 and 21) suggests a relationship to local human activities. Note in particular the dramatic change in age classes for Tsp. 11 S., Rng. 5 W., Sec. 5 and 6 (see Maps 2 and 11; Tables 14 and 15; Figs. 37 and 38; Appendices F and G).



disease, but scattered sprouts and acorns remained viable; or, 2) the land was cleared (perhaps centuries earlier) and the oak were planted by people. The second possibility is not so farfetched as it may seem. Wilkes (1845) remarked that the oak groves of the Willamette Valley in 1841 were so regularly spaced as to "appear to have been planted by the hands of man," and Kalapuyans of that time were known to cultivate tobacco from seed in isolated openings (Douglas 1905). At the time of settlement, white oak was found throughout the Willamette Valley, in western Washington, on the San Juan Islands (White 1995), and on Vancouver Island, Canada. People cultivated oak in the Sacramento Valley (Wilkes 1845), in northwestern California (Thompson 1991), and in southern Oregon. Although Kalapuyan people were known to be largely dependent on camas and tarweed for subsistence during early historical time (Zenk 1990), it is possible that their ancestors or predecessors in Soap Creek Valley were equally dependent on acorns, or favored oak for some other reason. If so, were those people capable of clearing a forest or planting a grassland in order to establish oak trees? This possibility seems not to have been considered by most forest ecologists or historians, yet the record of agricultural development in other areas of North America, including the Mississippi Valley, the Great lakes region, and southern Mexico, demonstrates the widespread practice of establishing and nurturing favored plant species over hundreds and thousands of years time (Burland 1970). Could the establishment and maintenance of white oak during the past 8,000 years in western Oregon (Hansen 1947; see Fig. 3) parallel the development of corn crops in Mexico during the same time period? If so, could the groves of oak described by Douglas (1906) and Wilkes (1845) in the early 1800s have been the result of purposeful management practices by Kalapuyans and/or earlier generations of people? Whether the Soap Creek Valley oak groves encountered by early surveyors (see Appendix F) were planted, or not, one thing seems certain: their existence was encouraged and maintained by Kalapuyan burning practices in late prehistoric and early historical time.

1626-1825: Prehistoric 2nd Growth

Prehistoric Soap Creek Valley forest cover patterns can be inferred reasonably for periods of time subsequent to the establishment of historical stands of old-growth. Specimens of individual trees and patches of perennial herbs, shrubs, and grasses can be located with similar methods and the same sources of information used in the preceding section. GLO and DLC surveys of the 1850s and 1880s add precision to details obtained from tree ring data and vegetation patterns (Bourdo 1956). Table 20 demonstrates how these combined sources of information can be used to locate possible parent tree seed sources that may have helped afforest Soap Creek Valley grasslands during historical time (see Figs. 3, 4, 17, 21, and 38). The Benton County timber cruise of 1915 (Bagley 1915; Map 11; Table 14; Appendix G) adds additional details, including locations of old-growth and patterns of forestation (Map 11), and tree species, heights, volumes, and diameters (Table 14). Table 21 summarizes original survey and cruise data. This table presents mapped tree locations and diameters and local tree ring data (Starker 1939; Rowley 1990: personal communication; Johnson 1991: personal communication) to obtain better understanding of prehistoric plant associations and stand sizes, locations, ages, and structures. This combination of data sets can be used to produce relatively accurate and detailed predictive maps and general descriptions of forest cover patterns for nearly 200 years of prehistoric time.

Table 20 also provides a general forest cover pattern for early historical Soap Creek Valley; a pattern directly inherited from late prehistoric time. This pattern includes scattered, nearly pure stands of ash that populate northern Valley flood plains established over 12,000 years earlier by Lake Allison; oak savannah on The Valley's foothills, southern, and eastern slopes; and Douglas-fir in steep tributary canyons, on higher elevations, and along southern headwaters (see Maps 2 and 5). Further detail can be added to these patterns by using land surveyors' field notes assembled in the 1850s and 1880s (see Map 2 and Table 21): camas and willow to areas containing ash; hazelnut and grasses to oak savannah; and bigleaf maple, yew, and fern to areas with Douglas-fir. Early aerial photos (see Figs. 26, 28, and 29), relict old-growth (see Figs. 36 and 37), swampland, and prairie patches (see Chapter III) add greater certainty to these predictions.

EARLY HISTORICAL CONDITIONS, 1826-1899

Forest conditions at the time of settlement in western Oregon, including those for Soap Creek Valley forests, are a matter of some controversy. Popular opinion dictates that much of the landscape was dominated at that time by a

Table 20. Size, location, and species of bearing trees, 1826-1882.

T-R-S	Landmark	Ash	A-Dia,	Oak	O-Dia.	DF	D-Dia.	M/M
			ASH					
10-5-12	County Line	4	8-15	3	15-18			
10-5-13	Coffin Butte	4	6-20	1	20			
10-5-24	Tampico Rd.	3	11-18	8	18-40			
10-5-14	Rifle Range	2	10-10	13	10-40			
10-5-23	Writsman Hill	1	14	21	10-36			1/0
10-5-11	Oak Hill	1	10	9	10-40			
10-4-7	Robison Rd.	1	12	4	10-30			
10-4-19	Tampico Ridge	1	20	2	10-15			
			OAK					
10-5-26	Soap Creek Road			17	8-36			0/1
10-5-34	Soap Creek Schoolhouse		10	12-30				
10-5-25	Glenders Hill			9	8-36			1/0
10-5-35	Nettleton Road			8	10-30			
10-5-27	OSU Research Ponds			8	10-30			1/1
10-5-15	Tampico Road			5	13-30			
11-5-3	Vineyard Mountain			5	12-16			1/0
10-4-18	Coffin Butte			3	15-24			
10-5-10	Smith Peak			1	30			
10-4-30	Hospital Hill			1	20			
11-5-2	Radio Hill			1	10			
			DOUGLAS-FIR					
11-5-7	McCulloch Peak							0/2
10-5-22	Forest Peak			8	11-30	1	24	0/2
11-5-4	Lewisburg Saddle			5	8-16	1	60	1/1
11-5-8	Bakers Creek			3	8-16	1	14	1/1
11-5-9	Patterson Road			2	16-20	1	14	1/1
10-5-33	Bakers Mountain			5	8-15	2	8-10	0/1
10-5-29	Kings Valley Ridge			1	24	2	8-30	1/0
10-5-28	Writsman Creek			4	8-12	3	8-13	1/0
11-5-5	Sulphur Springs			3	8-16	3	6-12	1/1
11-5-6	Cedar Grove			1	8	4	6-60	3/1
10-5-32	Beldon Creek					5	10-50	3/1
30 Sec.	Total BTs	17	6-20	161	8-40	23	6-60	15/13

T-R-S	Township S., Range W., Section No.
Landmark	1999 Soap Creek Valley landmark names. See Map 2 and Table 2.
Ash	Number of 1853-1859 ash BTs.
A-Dia.	Range of 1853-1882 ash BT diameters in inches.
Oak	Number of 1853-1882 oak BTs
O-Dia.	Range of 1853-1882 oak BT diameters in inches.
DF	Number and range of diameters for 1852-1882 Douglas-fir BTs.
D-Dia.	Range of diameters for 1852-1882 Douglas-fir BTs.
M/M	Number of bigleaf maple/misc. species for 1852-1882 BTs.

Table 21. Location, age, and species of tree seed sources, 1600-1915.

T-R-S	Seed 1	Seed 2	DF	Ash	Oak	Understory
		DOUGLAS-FIR				
11-5-6	1600 DF/RC	1650 DF/WF	4	1		fern/hazel/tassel
10-5-32	1650 DF/WF	1750 DF	5			fern/hazel/yew
11-5-5	1650 DF/WF	1750 DF/WF	3	3		fern/hazel
10-5-28	1650 DF/Oak	1800 DF	3	4		fern/grass/hazel
10-5-33	1650 DF/Oak	1800 DF/WF	2	5		fern/grass/hazel
10-5-29	1650 DF/Oak	1800 DF	2	1		grass/hazel
10-5-22	1650 DF/Oak	1750 WF/DF	1	8		fern/hazel
11-5-4	1650 DF/WF	1750 DF	1	5		fern/grass/hazel
11-5-8	1650 DF/WF	1750 DF	1	3		fern/hazel
11-5-2	1650 DF/Oak	1800 DF		1		
11-5-3	1650 DF/WF	1800 DF		5		arrowwood/grass
10-5-35	1650 DF/Oak	1800 DF		8		fern/hazel
11-5-7	1650 DF/WF	1750 DF				fern/hazel/tassel
11-5-9	1700 WF/DF	1750 DF/WF	1	2		fern/hazel
10-5-23	1750 DF/WF	1800 DF		21		
10-5-15	1800 DF/Oak	1850 DF		5		fern/hazel
				ASH		
10-5-12	Ash/Oak			4	3	camas/hazel
10-5-13	Ash/Oak			4	1	camas
10-5-24	Oak/Ash			3	8	
10-5-14	Oak/Ash			2	13	
10-5-11	Oak/Ash			1	9	
10-4-7	Oak/Ash			1	4	
10/4/19	Oak/Ash			1	2	
					OAK	
10/5/26	Oak/Alder				17	
10/5/27	Oak/Maple				9	Pine (*)
10/5/25	Oak/Maple				8	
10/5/34	Oak/Willow				10	Pine (*)
10/4/18	Oak				3	
10/4/30	Oak				1	
10/5/10	Oak				1	
30 Sec.	Totals		23	17	161	

T-R-S	Township S., Range W., Section No.
Seed 1	Estimated stand age. DF = Douglas-fir, WF = white fir, RC = redcedar
Seed 2	Estimated stand age
DF	Douglas-fir bearing trees, 1853-1882
Ash	Ash bearing trees, 1853-1859
Oak	Oak BTs, 1853-1882
Understory	Shrub, grass, and herbs noted by PLS surveyors, 1853-1882
Pine (*)	Although native pine occurs in Benton Co., none has been identified in Soap Creek Valley to this time. Surveyor may have used common name for DF (Douglas 1905) or misidentified WF.

“blanket” of large, old conifer trees that has been subsequently reduced in size and contiguity (FEMAT 1993):

> At the time of settlement . . . the Northwest was blanketed with forests. Perhaps 60 to 70 percent of the forest was old growth . . . over 200 years of age . . . Even on public lands, cutting has created so many holes in the blanket of the forest, that the fabric holding the segments together has been severed.

This perspective has been generated, in part, by modern forest scientists. For example, according to Franklin and Dryness (c.1988):

> At the time of the first settlers, conifer stands clothed almost the entire area of western Washington and northwestern Oregon from ocean shore to timberline except for the Willamette valley and some prairies in the Puget Sound trough. Presently, 82 percent of western Washington and Oregon is still classed as forest land.

Map 19 illustrates a condition of land blanketed with old trees; a condition not supported or documented by the findings of this study (see Chapter III). For example, Thornton T. Munger, a forest scientist who lived in the Pacific Northwest during the early twentieth century, noted in 1916:

> Instead of finding an uninterrupted forest carrying 100,000 feet or more per acre reaching from the Cascades to the Pacific, the first settlers seventy-five years ago [1840] found in The Valleys great areas of “prairie” land covered with grass, brakes, or brush which were burned and kept treeless by the Indians, and mountain sides upon which forest fires had destroyed the mature forest and which were then covered by a “second growth” of Douglas fir saplings or poles.

Maps, figures, tables, quotations, and references contained in this thesis support Munger’s 1916 eyewitness account over more current descriptions. Map 21 summarizes theses data in a format that can be compared to Map 19 and to general popular and scientific accounts.

1826-1845: Exploration and Epidemic

The first historical account of the Soap Creek Valley area was provided by the 1826 Hudson's Bay Company (HBC) beaver hunting expedition led by Alexander Roderick McLeod (Douglas 1905; Davies 1961) that passed southward, up the west side of the Willamette Valley. Traveling on horseback, the troupe established a new trail from HBC headquarters in Vancouver, on the Columbia River, to the Umpqua River. The HBC expedition is the first known to horse trail traversing the length of the Willamette Valley, along a route that approximately follows the course of Highway 99W today (see Maps 13 and 18). In addition to McLeod's crew of predominantly Metis ("French Canadians": usually refers to Canadian-born "half-breeds" of French and Iroquois ancestry; see Jackson 1995 for a discussion of these terms) trappers, was Scottish botanist David Douglas, who gathered plant specimens to send to Europe. Both McLeod and Douglas kept detailed daily journals, which have been published and widely quoted (Douglas 1904; 1905; Davies 1961). Their journals constitute the earliest historical accounts of native Polk and Benton county people, plants, and animals.

On October 4, 1826, in the approximate area of Berry Creek (see Map 2), McLeod noted a group of Kalapuyans "gleaning a miserable existence digging roots" (Davies 1961). These observations were in the immediate vicinity of prehistoric sites noted by Rohner (1993) and Hanish (1994), on land claimed as "ancestral" by Luckymute and Chapanafa Kalapuyans a quarter century later (see Chapter III; Map 13; Mackey 1974). Thus, the written accounts of McLeod and Douglas constitute the first records of prehistoric (and now, "early historical") human families, land management practices, food harvesting methods, and forest cover patterns, in the Soap Creek Valley area. They are also the first records of domestic animals (the expedition's horses) to graze in the vicinity of Soap Creek. Douglas and McLeod noted an almost total lack of grass and unburned vegetation along the entire length of the Willamette, a result of "Indian burning." Purposes ascribed by Douglas (1905) for the widespread broadcast burning of Kalapuyans included hunting, honey production, and "habit." The reference to honey is curious because honeybees are not thought to have been present in the Willamette Valley the late 1840s, when they arrived via the Oregon Trail (Carey 1971). In this instance, Douglas may have been referring to the Kalapuyan practice of burning out wasp nests and eating the cooked larvae (Boyd 1986).

On October 5, 1826, the men camped in a "small circular valley" (Douglas 1905) that may have been Soap Creek Valley. From the present location of the Soap Creek bridge on Tampico Road, The Valley appears to be circular, surrounded by Coffin Butte, Tampico Ridge, Glenders Hill, Bakers Mountain, Writsmans Hill, and Smith Peak (see Map 2; Table 2; Zybach and Fraser 1998). In 1979, Rowley (Jackson 1980; Rowley 1996) described "axe marks" dating to 1826 in a Soap Creek Valley tree near Lewisburg Saddle. If Rowley's interpretations are correct, this likely constitutes the earliest physical evidence of Europeans (and of metal) in Benton County; and perhaps the only remaining physical evidence of McLeod's and Douglas' historic journey that has been identified in western Oregon.

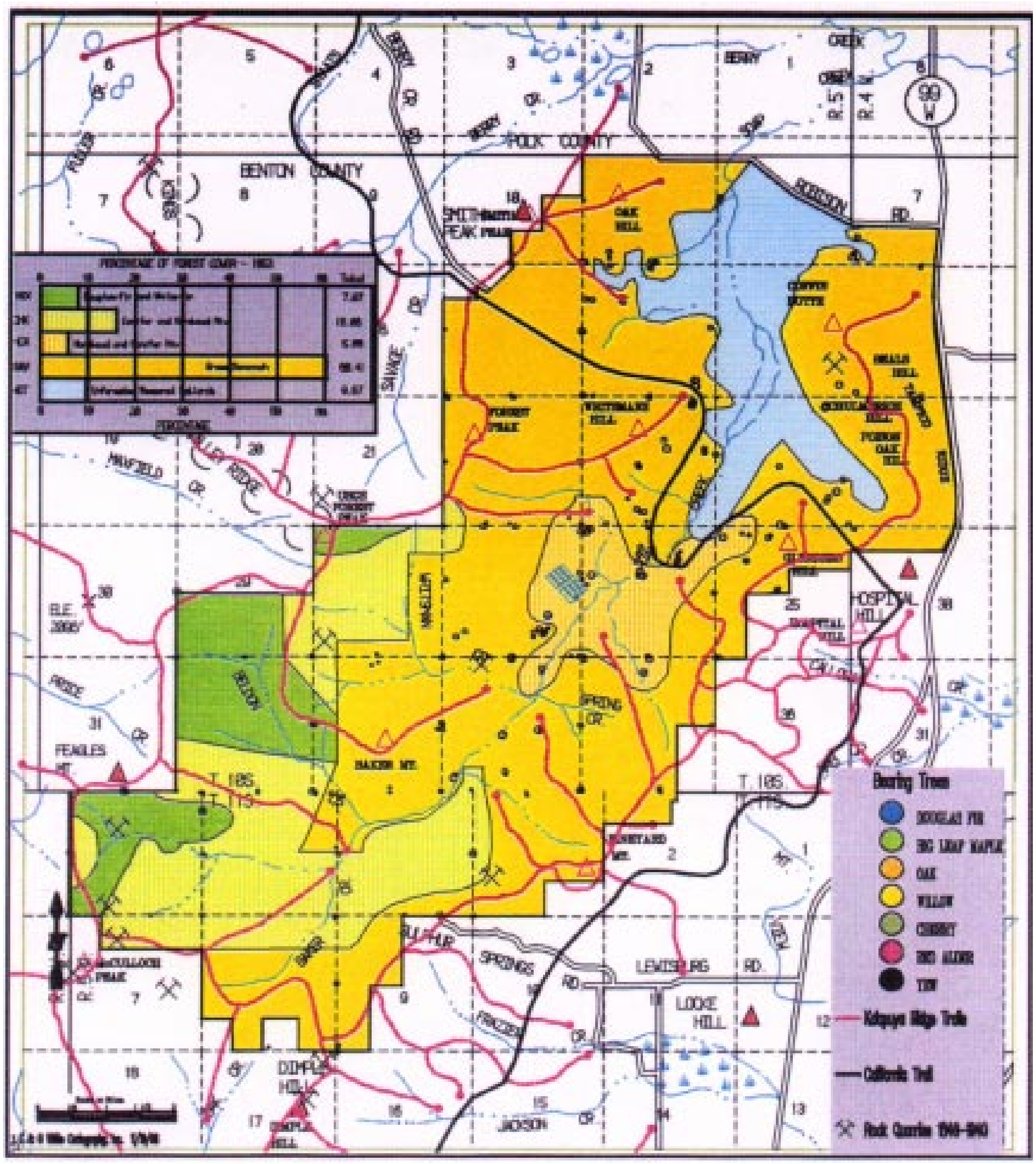
In 1834, HBC Chief Trader John Work and his beaver hunting brigade followed the same route blazed by McLeod's 1826 expedition. Work noted similar conditions of universal broadcast burning in the Willamette Valley that had been recorded by his predecessors (Scott 1923). He had also noted widespread sudden sickness and subsequent death among hundreds of Indian families during his journey through western Oregon and northern California during the previous two years (Scott 1928; Maloney 1942; Cook 1955; Boyd 1986). Many of the men and women in his troupe had also fallen ill at the time, and several died during the course of the expedition. It is currently believed that Work may have carried malaria with him on his travels through Idaho, eastern Oregon, California, and western Oregon (Boyd 1990: personal communication), and the spread of this disease was a primary cause of the decimation of many of the Indian communities he visited during that time. By 1841, Charles Wilkes noted that only 400 or so Kalapuyans survived in the entire Willamette Valley (Wilkes 1845)—the remnants of at least a half dozen nations estimated to have numbered 10,000 to 12,000 or more individuals prior to the time of the Lewis and Clark expedition in 1805-1806 (Boyd 1986; 1990). When the first American emigrants settled in Soap Creek Valley in 1846, Klickitat Indians (who had owned horses for several decades and had associated with white trappers for nearly 40 years) were claiming ownership of the Willamette Valley, having "conquered" the decimated Kalapuyans (Fagan 1885; Minto 1903; Rawie 1994).

Horizontal forest cover patterns of Soap Creek Valley in 1826 are depicted in Map 21. This provides a measure of plant species diversity called "importance" (Kimmins 1987). Map 21 is based on public land surveys completed between 1852 and 1882 (see Maps 2 and 11; Tables 20 and 21; Appendix F). Mapped Kalapuyan foot trail routes (see Map 18) have been developed throughout the area by reconstructing archaeological data, anthropological research (e.g., Minore 1976), and oral history information (Zybach et al., 1990; Rohner 1993; Hanish 1994; Cook 1995; Rowley 1997). At that time, grizzly bears, whitetail deer, California condors, lamprey eels, and cutthroat trout also inhabited the Soap Creek Valley area on a seasonal basis (Boyd 1986; Jacobs 1945; see Appendices E and H). Most of the landscape could be characterized as wet and bunchgrass prairies, oak savannah, and conifer forests. A large camas field, located to the northwest of Coffin Butte, and a stand of cedar, about 2 miles upstream from Sulphur Springs, were likely resource gathering and processing areas for local families. Other local plants used by Kalapuyans in 1826 included tarweed, oak, brackenfern, blackberries, strawberries, hazelnuts, arrowwood, yew, and onions (see Table E.3). This map represents initial conditions for Soap Creek Valley for historical time (see Chapter IV), and—based on available evidence—likely represents general conditions for 1500 as well.

1846-1882: Ranching and Home Construction

The settlement of Soap Creek Valley by American pioneers in 1846 was quickly followed by establishment of permanent homes, fences, plowed fields, wagon roads, orchards, and the eviction of remaining local Indian families (Longwood 1940). Bear and wolves were systematically exterminated from the area through hunting (Fagan 1885; Storm 1941), blacktail deer replaced whitetail deer (Poesch 1961), and orchardgrass, bachelor buttons, and vetch spread outward from the settlers' lawns and fields (Glender 1994). Large herds of cattle and horses, many destined for trade in the gold fields of California, southern Oregon and, later, eastern Oregon and Idaho, grazed available prairies and meadows (Longwood 1940). Kalapuyan burning was replaced by mass livestock grazing, and prairies remained largely free of tree seedlings and brush (see Figs. 18 and 24). An attempt to create a small town in The Valley during the mid-1850s quickly failed for a variety of economic, geographical, and political reasons.

Map 21. Forest cover patterns & bearing tree locations, 1826. Soap Creek Valley was largely grassy savannah and prairie at the time of discovery by Europeans. This map is based on original PLS BTs and surveyor notes of conditions between 1850 and 1883 (see Appendix F). Note Kalapuyan foot trail network and the location of horse trail blazed in 1826 (see Fig. 28; Map 13). Wetland to west of Coffin Butte was a major camas grove used by Kalapuyan families (Rohner 1993). The cedar grove in SE 1/4 of NW 1/4 of Sec. 6, Tsp. 11 S., Rng. 5 W. was also a likely resource procurement site for prehistoric families (see Appendix G; Zybach et al., 1990).



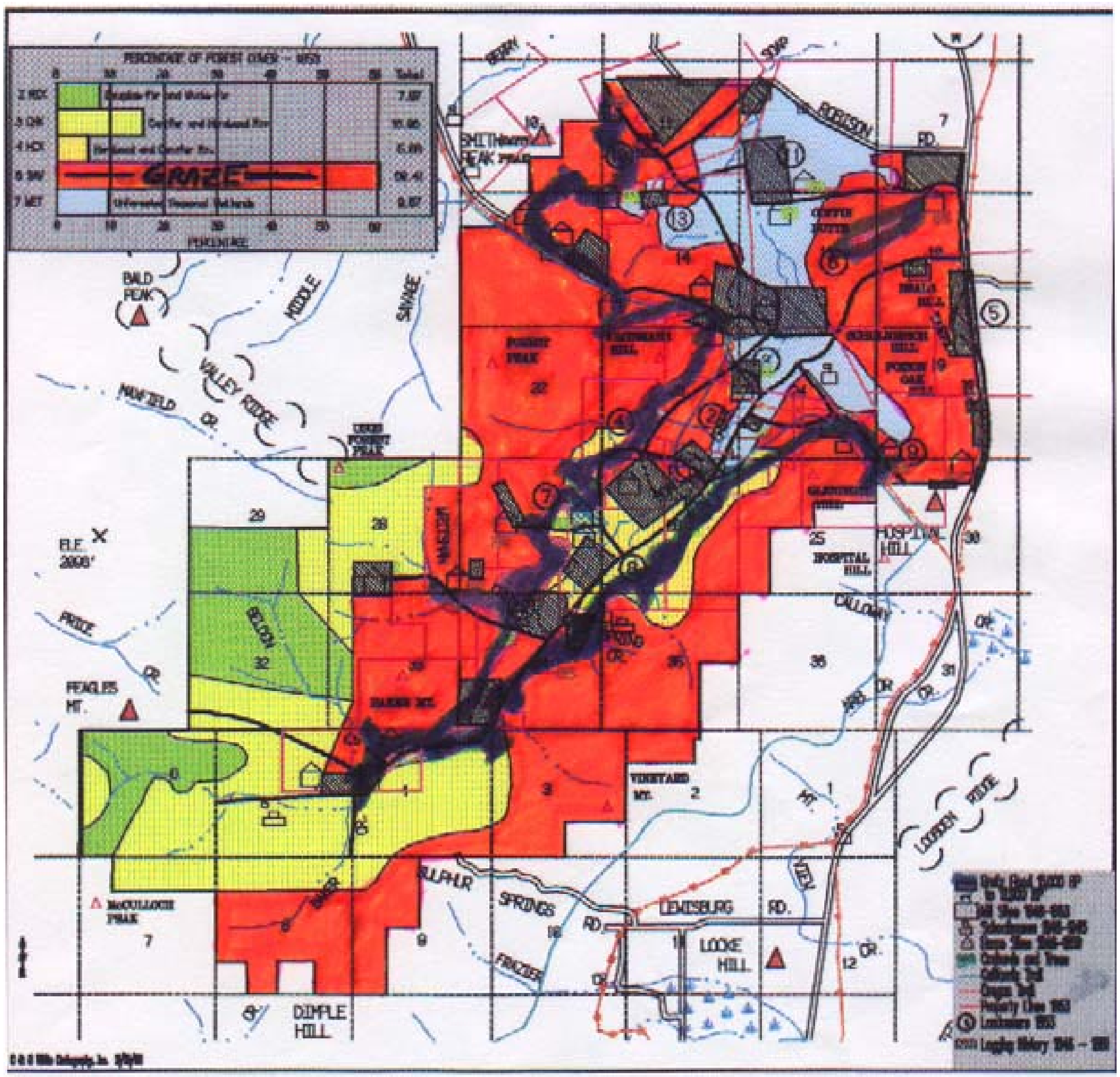
The snowstorm of 1861 likely killed a majority of the livestock in the Willamette Valley (Oliphant 1932), including herds based in Soap Creek Valley. Economic depression, brought about partly by the Civil War, prevented local farmers and ranchers from rebuilding their herds for several years (Oliphant 1932; Longwood 1940). The snowstorm of 1881-82 also had a devastating effect on local livestock populations (Oliphant 1932; Nettleton 1956; Jackson 1980; Starker 1984), and local landowners began to develop alternate strategies to produce income.

Map 22 shows the original locations of pioneer homes, orchards, fields, and wagon roads—and new property boundaries—that had been established by landowners between 1846 and 1853 (see Maps 2, 5, and 10; Table D.2). Note the extent of the conifer forest is about the same as 27 years earlier (Map 21), but virtually all savannah and prairie lands have been converted to fenced crops (to reduce open range livestock damage) and unfenced pasture by local residents. Very little of the forested area has been claimed by these pioneer landowners, indicating the relative property values of that time that separated grassy prairies and tillable flats from timbered hillsides. Basic methodology used to construct this map (and Map 21) from original land survey data is described by Bourdo (1956). This method has been subsequently used by a number of researchers to describe other areas of pioneer-era vegetation patterns in the Willamette Valley (see Habeck 1961; Thilenius 1964; 1968; Johannessen, Davenport, Millett, & McWilliams 1971; Towle 1974; 1982).

1883-1914: Fencing and Farming

By the early 1880s, a new generation of farmers and landowners had succeeded their pioneer predecessors in Soap Creek Valley. Steamboats were regularly transporting local crops to the international ports of the Columbia River and railroads had connected the Willamette Valley to national markets in California and the eastern US. Pastureland that had been dedicated to the production of beef and wool were being converted to wheat and oat crops and planted to commercial fruit and nut orchards. (Longwood 1940). Still, basic farming methods remained the same as they had been for decades, and farm families continued to depend upon horses for transportation and powering farm

Map 22. Forest cover patterns & landowner boundaries, 1853. Pioneer settlement in 1846 resulted in significant changes to Soap Creek Valley forest cover patterns: establishment of year around residences, cessation of Indian broadcast burning, grazing of prairie grasses by domestic livestock, and widespread plantings of exotic trees, herbs, shrubs, and grasses. Numbers within property boundary lines (see Maps 5 and 11) correspond to landowner names in Table D.2. Hatched areas are locations of first cleared and fenced fields in Soap Creek Valley, many of which were planted to wheat (Longwood 1940; Murphy 1995). Note correlations of land claims to pasture lands and to the extent of Bretz Flood influences.



equipment (see Fig. 24). The national economic depression of the 1890s likely affected local families to a lesser degree than their urban counterparts due to a tradition and capability of self sufficiency. Increased populations in western Oregon led to attempts to settle hillside lands that had been avoided by pioneer landowners (Longwood 1940; Bowen 1978; Olson 1994). The establishment of local sawmills during the 1890s resulted in the first industrial clearcut logging in Soap Creek Valley and offered opportunities for local landowners to capitalize on forested hillsides that had previously held little financial value (Thomas & Schroeder 1936).

LIVING MEMORY, 1900-1999

The memories of the oldest participants in the Soap Creek Valley Oral History Series begin to take shape in the early 1900s (see Fig. 4; Table 4), at about the same time local farming, ranching, and logging methods began to change dramatically. For that time, at least two distinctly different viewpoints currently represent forest conditions in western Oregon. One view, popularized in recent years by forest ecologists, environmentalists, wildlife biologists, and others with an interest in Douglas-fir Region history (FEMAT 1993), is summarized by Spies and Franklin (1988):

> In the early part of this century, most of the forested area west of the crest of the Cascade Range was covered by old-growth forests consisting of Douglas-fir, western hemlock . . . and several other large, long-lived species. Most of these forests were probably more than 300 years old and many exceeded 750 years.

By "most" (over half) of the forested area, the authors apparently rely on information that: "At the time of the first settlers, conifer stands clothed almost the entire area of western Washington and northwestern Oregon from the ocean shore to the timberline . . . [of which] 82 percent of western Washington and Oregon is still classed as forest land" (Franklin & Dyrness c.1988). The cause of reduction of forest land from nearly 100% ("except for the Willamette Valley and some prairies in the Puget Sound trough") to 82% in 150 years is stated to have been caused by: "Clearing away the obstructing forest was, of course, the first order of business for settlers . . . The lumber industry began almost simultaneously and grew rapidly in importance about the turn of the century" (Franklin & Dyrness c.1988).

A differing perspective is provided by Gannet (1902), who reported for 1900: “the total area of [Oregon] west of the crest of the [Cascade] range is 28,877 square miles, of which 15,089 square miles, or 52 percent, are occupied by merchantable timber [of all ages], and 7, 102 square miles, or 24 per cent, are open country.” Although the two views are for slightly different areas of land, the descriptions remain clearly contradictory for most of western Oregon, including Soap Creek Valley. One view is that pioneer settlers had cleared their claims of timber, yet nearly 90% or more of the land remained forested by 1900, of which most of the remaining timber was old-growth (about 50% or more of the total land area). The other view is that pioneer landowners had settled the open prairies of western Oregon and that forested land was at that time (and in 1900, as well) predominantly young reproduction and second growth, with scattered stands and pockets of old-growth (Leiberg 1900; Gannett 1902; Munger 1916; Zybach 1994b). For Soap Creek Valley, the amount of old-growth conifer acreage remained about the same from 1845 until 1900 (see Chapter III; Figs. 36, 37, and 38; Maps 12 and 22; Tables 14, 15, 20, and 21; Appendices F and G), of which the oldest trees were barely 300 years of age in 1900 (see Table 19), and much of the prairie lands had afforested to young stands of Douglas-fir and grand fir less than 40 years of age (see Chapter III; Figs. 14, 17, 19, 20 and 21).

1883-1914: Fencing and Farming (cont.)

As noted above, at some point in the late 1800s or early 1900s, the first memories of the oldest Soap Creek Valley informants (see Fig. 4; Table 4) began to be formed. Olson (1994), Cook (1995), and Murphy (1995), had clear descriptions of events and circumstances in the area from that time. Olson, in fact, is shown in a c.1902 Soap Creek School photograph in which he could still identify most of the other 20 students and adults (including his “7-foot tall” school teacher, Mrs. de Moulin) nearly 90 years later, in 1990 (Olson 1994). The principal change to Soap Creek Valley farming and logging during this time was the advent of the internal combustion engine (see Fig. 25).

Beginning in the early 1900s, the local use of automobiles and tractors permitted “deep plowing” farming practices and the creation of “truck farms”; i.e., the ability to drive select crops to local markets. Both Olson (1994) and Murphy (1995) claimed the “coming of the automobile” was the biggest change they had witnessed in their lives, while Rohner (1993), Glender (1994), and Cook (1995) emphasized the dramatic changes the use of internal combustion engines brought to farming. As farms became smaller in size and more intensely managed for a greater variety of crops, fencing between fields and ownerships became more common—not to keep livestock out, as in pioneer times, but to keep them in. Free ranging cattle and horses began losing value, while milk cows, turkeys, and goats became more common (Longwood 1940; Glender 1994; Cook 1995).

1915-1940: Automobiles and Logging

In 1915, the State's "Good Roads" policy led to a rapid increase in road construction throughout western Oregon. This policy led to better market access for rural farms and forestlands not served by railroads or navigable streams (Carey 1961), including the farms and timber of Soap Creek Valley. World War I created an immediate demand for agricultural goods and lumber products, and The Valley's landowners were able to quickly capitalize on the new markets (Olson 1994; Cook 1995). The diversification of farming practices and creation of new logging and sawmill jobs helped lead to an increased local population during the 1920s (Rohner 1994; Hindes 1996), but the Great Depression of the 1930s caused the local economy to stagnate. As a result, many local families moved to other locations and The Valley's population declined for several years (Hanish 1994; Vanderburg 1995). In the 1920s and 1930s, the OSC College of Forestry began to buy logged over land in The Valley, under the leadership of T. J. Starker (Jackson 1980; Starker 1984). Establishment of the State's forest seedling nursery in the 1920s (McDaniel 1931) and a CCC camp in the 1930s (Thomas 1980) on nearby property provided the trees and manpower necessary to begin planting the new land acquisitions (see Fig. 19; Thomas & Schroeder 1936; Sekermestrovich 1990; Zybach c.1991). A catastrophic snowstorm in 1937 killed hundreds of local sheep and other livestock (Dickey 1995), but had a lesser effect on local landowners than similar events in the 1800s and early 1900s. A principal reason for the difference is that farmers and loggers were no longer dependent on livestock for transportation or to operate harvesting and processing equipment (Rohner 1993).

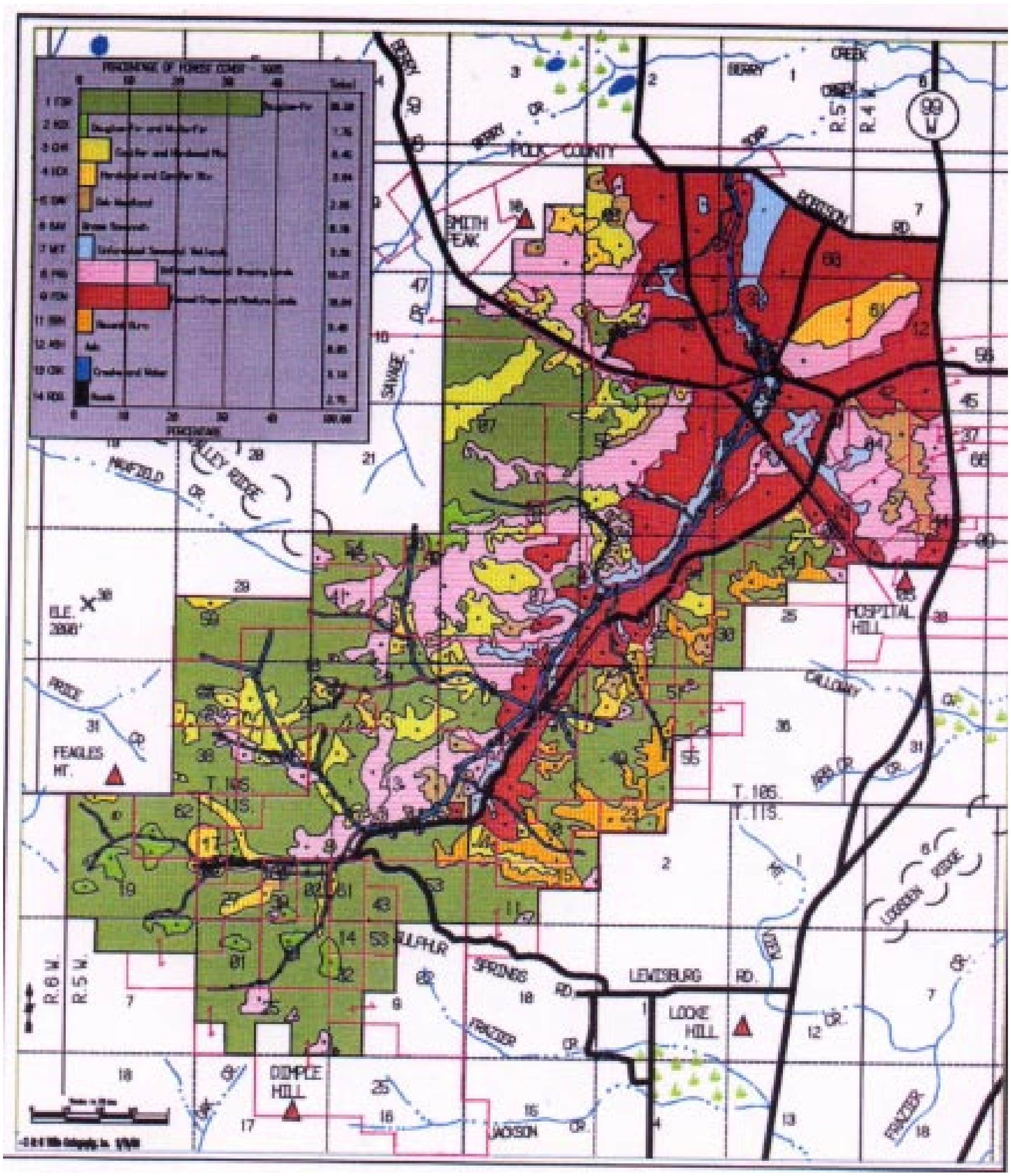
Map 23 shows horizontal forest cover patterns of Soap Creek Valley as documented in 1936 by aerial photographs (see Figs. 26 and 29). Property lines and landowners are based on Metsker maps from 1929 (1929a; 1929b; 1929c). Owners are listed in Table D.3. Note the large increase in number of owner/ residents since 1853, and that few family names are consistent with the list of 1853 owners (Table D.2). This indicates an active immigration and emigration on the part of landowners and residents during the first 75 years of Soap Creek Valley settlement. In addition, a large increase in conifer forest area can be noted, primarily due to the decreased need for grazing land in the previous 25 years (see Fig. 21).

1941-1962: Wind and War

The establishment of Camp Adair at the outset of WW II (Berg 1983; Rohner 1993; Glender 1994; Rawie 1994; Dickey 1995; Polk County Historical Museum 1992; 1993; Zybach & Phelps 1997) resulted in the large scale evacuation of most Soap Creek Valley residents, an almost complete stoppage of farming and logging practices in The Valley, and the removal of most fencing, houses, and barns. This change in land use resulted in a noticeable increase in deer, bear, and raptor populations, likely due to the general lack of competition from domestic animals and a sharp reduction in predator control, hunting, and fishing by local residents. After the War, much of the Camp Adair property was obtained by OSU (see Maps 3 and 16), and families began to move on to adjacent properties. Many of the new families were residential, rather than farmers, and new home construction reflected this change (Grabe 1990).

Map 24 shows the horizontal forest pattern in 1945, based on US Army aerial photographs from that year (UO Knight Library Map Room) and local forest surveys (see Fig. 28). Note the continued increase in conifer forest area, the sharp decrease in agricultural use, and the military and industrial development of the Coffin Butte area (see Figs. 31 and 32). Development boundaries were interpreted from 1990 Benton County tax lot maps (Benton County Tax Assessors Office 1990; Zybach et al., 1990). Windfall resulting from the October 14, 1962 Columbus Day storm caused an immediate increase in local clearcut logging and a more thorough continuation of previously established salvage logging operations (see Table 16; Jackson 1980; Rowley 1996; Davies 1997).

Map 23. Forest cover patterns & landowner boundaries, 1929. By the start of the Great Depression in 1929, much of Soap Creek Valley had been subdivided into smaller farms and ranches and fenced (see Figs. 27 and 28), or afforested to stands of Douglas-fir and oak (see Map 20; Chapter III). Numbers within property boundary lines correspond to landowners listed in Table D.3. Note the great increase in residential landowners that has occurred since pioneer settlement (Metsker 1929a; Metsker 1929b; Metsker 1929c).



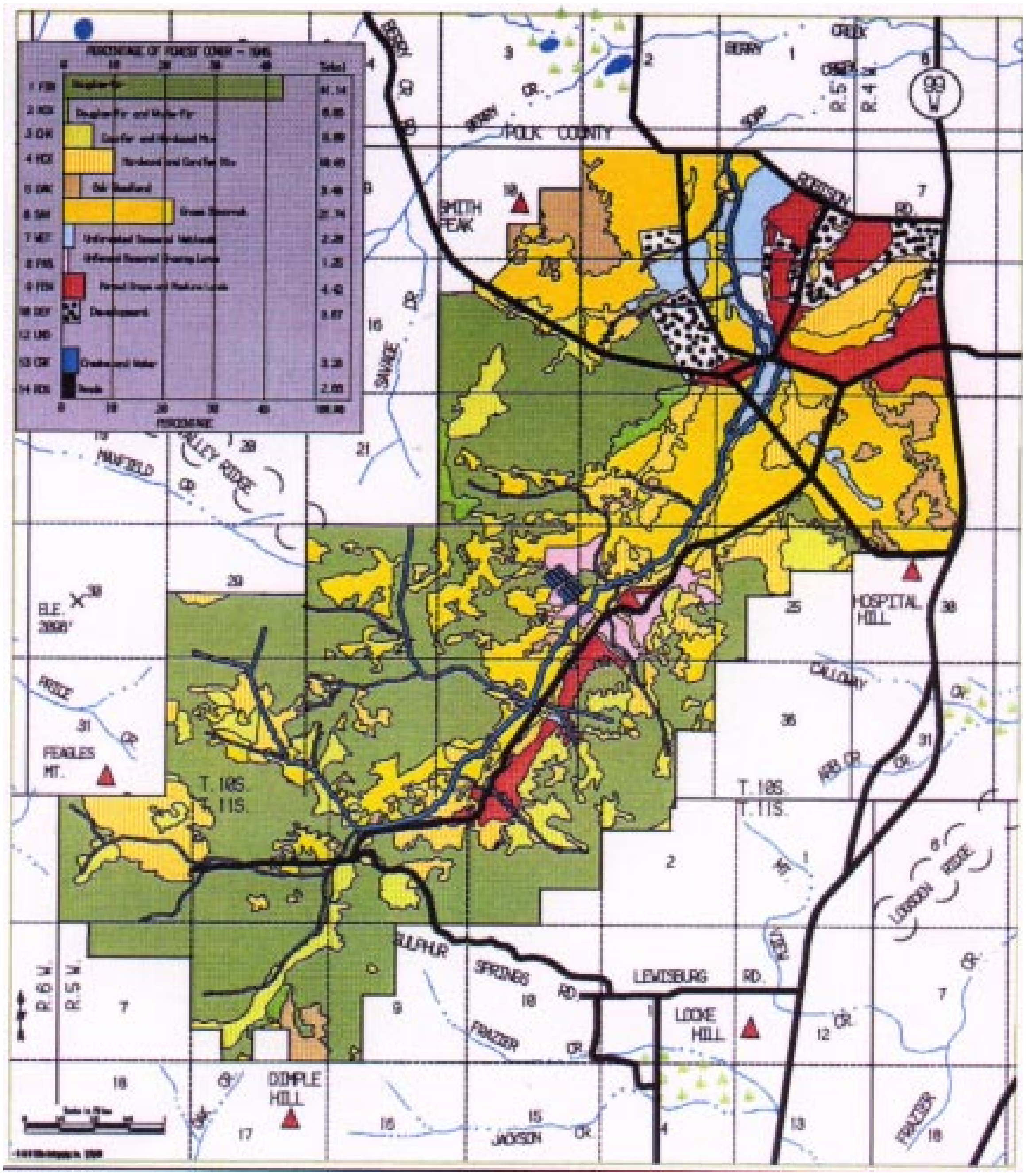
1963-1999: Recent Developments

Since 1963, changes that have affected forest cover patterns of Soap Creek Valley include the widespread establishment of conifer plantations in old clearcuts (including those associated with the Columbus Day Storm) and prairie lands acquired by OSU, establishment of a major solid waste landfill to the south of Coffin Butte (see Figs. 33 and 34; Westlund 1993; Kessinger 1999), and creation and proliferation of numerous residential housing developments (see Map 3; Table D.4). Conifer forestland has continued to increase in area, and commercial agricultural uses have decreased during this period. Dramatic increases in human population have been accompanied by corresponding increases in pet populations, secondary road and driveway constructions, lawn and ornamental plantation establishments, and home building projects.

Land ownership patterns for 1990 are shown in Map 3. Landowners are listed in Table D.4. Information regarding land ownership is based upon county survey data (Zybach et al., 1990). Note, again, the lack of family ownership stability and the increase in numbers of residential landowners between 1920 and 1990. Local land ownership changes and population growth rates have been at least as great in the recent (1929-1990) 62-year period as in the previous (1853-1928) 76-year period. This pattern also exists for the (1826-1852) 26-year period preceding the 1853 survey and the most recent (1991-1999) nine-year period (see Land ownership patterns for 1990 are shown in Map 3. Landowners are listed in Table D.4. Information regarding land ownership is based upon county survey data (Zybach et al., 1990). Note, again, the lack of family ownership stability and the increase in numbers of residential landowners between 1929 and Table 17; Appendix D). Dominant trends continue to be decreased numbers and varieties of large wild vertebrates (since 1811), increased variety of introduced plants and animals (since 1826), increased human population (since 1832), decreased grassland area (since 1832), increased conifer forest area (since 1832); decreased agricultural uses (since 1941), ephemeral land ownership claims (since 1846), decreased wild carnivore populations (since 1846), and smaller residential properties (since 1857).

<u>Summary</u>. Table 22 provides a chronological listing of events affecting Soap Creek Valley forest cover patterns during the past 500 years. Map 20 shows

Map 24. Forest cover patterns & Camp Adair developments, 1945. The dedication of most Soap Creek Valley land to a single use (see Map 17) by a single owner (see Map 16) resulted in rapid and dramatic changes to forest cover patterns: livestock and fences were removed and grass species went wild; Coffin Butte quarry operations were greatly increased (see Fig. 32); and quarried rock was used to build several new roads, most of which remain to this time (see Fig. 31; Map 18)).



how these events have combined to alter distribution and ages of Douglas-fir forestlands on OSU Research Forests properties (see Map 3). Table 23 and Map 24 summarize primary changes to horizontal patterns (and plant species “importance”) as shown on Maps 16, 17, 18, and 19. The living conifer forests of Soap Creek Valley owe their existence largely to the decline of Indian burning tied to human plagues in the early 1830s, pioneer settlement by American families in the 1840s, the decline of grazing mammal populations tied to the introduction of automobiles and tractors in the early 1900s, tree planting projects tied to CCC and OSU activities in the 1930s, and sharp increases in the value of Douglas-fir timber after WW II. The majority of these stands, and most of the area they cover in Soap Creek Valley, are a direct result of afforestation processes that occurred between 1830 and 1960 (see Chapter III; Maps 20, 21, and 24). The majority of trees are Douglas-fir, most of which were established by afforestation and reforestation tree planting projects that began in the early 1930s and continue through today (see Figs. 19, 21, and 38). Despite the relatively young age of most Soap Creek Valley forest trees (see Map 20 and Table 19), a significant number of old-growth Douglas-fir and oak existed in The Valley at the time of settlement (see Map 12; Tables 14, 15, 20, and 21; Appendices F and G), most of which were subsequently logged (see Figs. 21, 26 and 37; Map 15; Table 16).

Discussion. Table 23 summarizes basic changes to forest cover patterns in Soap Creek Valley from 1926 to 1945, as shown on Maps 21, 22, 23, and 24. These can also be interpreted as basic changes in land use for the same time periods, as illustrated by Map 25. The interrelationships between changing human values, changing human activities, changing forest cover patterns, and changing wildlife populations, as illustrated by Fig. 35, is also shown by Map 25. These patterns can be called “cultural landscape patterns,” forest cover patterns, or wildlife habitat patterns, depending on personal bias or perspective. In 1826, people grew camas and tarweed and harvested acorns; oak savannah and grassy prairies were the most common forest cover pattern and the principal form of wildlife habitat. In 1853, people established permanent homes and raised livestock on the open range provided by former prairie lands; rangeland became the most common forest cover pattern, and predatory carnivores and raptors were exterminated. In 1929, people maintained family farms for subsistence and income, and afforested rangelands were logged for timber crops and planted and seeded for future income; wildlife was introduced and specifically

Table 22. Timeline of events affecting forest cover patterns, 1500-1999.

	PREHISTORIC CONDITIONS
1500	Introduced diseases decimate North American families and communities
1539	Birth of savannah oak to the southwest of Soap Creek Valley
1550	Birth of oldest historical Soap Creek Valley oaks
1602	Birth of Soap Creek Valley Douglas-fir to north of Lewisburg Saddle
1788	American fur traders note metal knives and smallpox to the west
1805	Lewis and Clark note 20-year old smallpox epidemic to the north
	EARLY HISTORICAL CONDITIONS
1826	First record of Europeans and domestic animals in the area
1832	Epidemics kill most Kalapuyans in western Oregon
1837	First major cattle drive through Soap Creek Valley
1846	First pioneer settlers in Soap Creek Valley
1848	Last major forest fire in Soap Creek Valley
1852	Private land and road surveys are formalized and PLS initiated in The Valley
1857	Town of Tampico platted along California Trail/Territorial Road
1861	Catastrophic snowstorm kills thousands of livestock in Willamette Valley
1881	Major snowstorm kills livestock, crushes buildings in Willamette Valley
1890	First commercial sawmills begin operation in Soap Creek Valley
	LIVING MEMORY
1905	Introduction of internal combustion engine for farming, transportation
1915	Oregon Good Roads movement gains noted/Soap Creek Valley forests are cruised
1925	Oregon Forest Nursery begins production a few miles east
1926	Sawmill camp established in Soap Creek Valley
1931	Dust storm from the east, Eston Carter home burns at base of Coffin Butte
1933	CCC Camp Arboretum is established adjacent to Oregon Forest Nursery
1936	Large plantation established following clearcut and fire in E. Soap Creek Valley
1937	Catastrophic snowstorm kills livestock, crushes buildings in Soap Creek area
1941	US Army establishes Camp Adair, begins training in Soap Creek Valley
1948	OSC obtains majority of Soap Creek Valley lands from US Army
1950	Four feet of snowfall on Soap Creek Valley ridgelines, one of deepest on record
1956	Major cold snap affects region, including Soap Creek Valley area
1962	Columbus Day hurricane from the south
1966	Housing subdivisions for urban commuters begin to appear in Soap Creek area
1973	US Endangered Species Act is adopted; spotted owls become local concern
1981	Friday the 13th windstorm from the west
1993	“Dean’s Plan” draft adopted for management of OSU Research Forests
1999	Coffin Butte Landfill catches on fire

bred for recreational hunting and fishing opportunities. In 1945, Army troops learned field maneuvers and weaponry and the land was used almost exclusively for that purpose; trees were clearcut for wartime needs and wildlife populations rebounded with the elimination of competition from domestic plants and animals. In sum, Raup’s observation that: “No forest has value until human beings feel a need for it . . . [American foresters] seemed unaware of the fact that those demands were governed by peoples’ value judgments, and that people

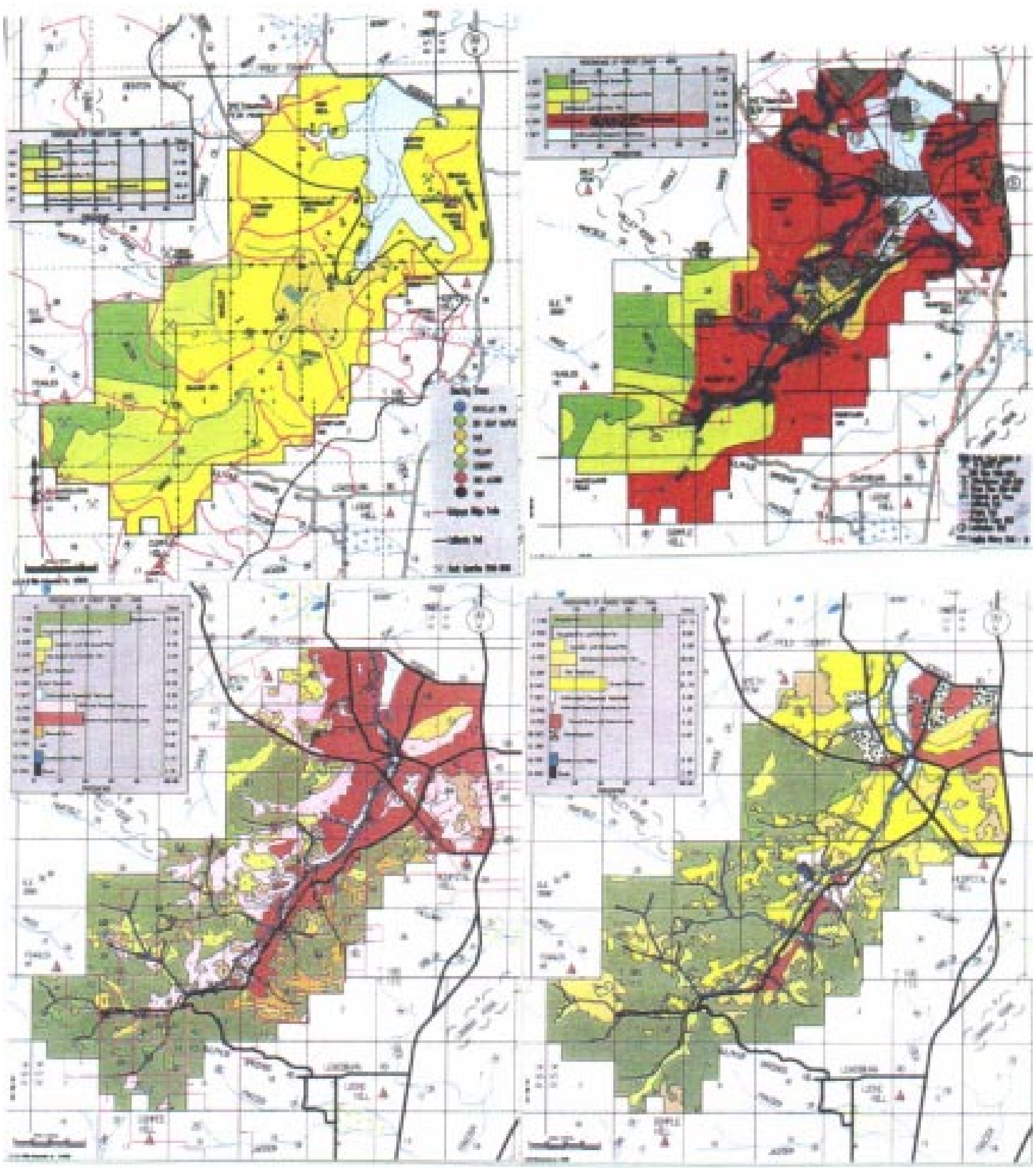
Table 23. Changes in horizontal forest cover patterns, 1826-1945.

Forest cover type	1826	1853	1929	1945	% Change	
Oak savannah	62	0	0	22	-40	
Wetland prairie	11	6	6	5	-6	
Douglas-fir/grand fir	8	8	41	41	+33	
Conifer/hardwood mix	14	16	8	6	-8	
Hardwood/conifer mix 5	6	6	14		+9	
Fenced crops	0	1	19	4	+4	
Open grazing	0	62	18	1	+1	
Structural development	0	1	2	7	+7	
TOTAL PERCENTAGE	100	100	100	100	-54	+54

Based on descriptions and figures contained in thesis body.
1826 Percentage of total Soap Creek Valley area shown on Map 16.
1853 Percentage of total Soap Creek Valley area shown on Map 17.
1929 Percentage of total Soap Creek Valley area shown on Map 18.
1945 Percentage of total Soap Creek Valley area shown on Map 19.
% Change in percentage of Soap Creek Valley forest cover type between 1826 and 1945. Negative changes as shown with a minus ("-") sign. Increases are shown with a positive ("+") sign.

changed their values at will" (Stout 1981) is consistent with the history of Soap Creek Valley forestlands. It is likely also consistent with the prehistory of those same lands, beginning with the time that people first entered The Valley's forests—a time probably 10,000 or more years ago.

Map 25. Comparative forest cover patterns, 1826, 1853, 1929 & 1945. Note relationships between forest cover patterns, wildlife habitat patterns, cultural values, and human products, and compare with theoretical models (see Fig. 34; Maps 19, 21, 22, 23, and 24; Tables 18, 22, and 23).
Upper Left. 1826: acorns, berries, camas, firewood, filberts, onions, seeds.
Upper Right. 1853: firewood, grain crops, orchards, pasturage, wood homes.
Lower Left. 1929: crops, firewood, homes, logs, plowed fields, wood fencing.
Lower Right. 1945: field maneuvers, mining, rifle range, sport hunting.



Chapter VI.
Conclusions

> I think the largest single need in American forest biology is the study of man's relation to forest land. Our foresters need to understand much more than most of them do about purely human motives and aspirations with respect to the land. They ought to become genuinely knowledgeable and respectful of people's economic, social, and aesthetic institutions.
>
> —Hugh Raup (Stout 1981)

This thesis has used oral histories to document the causes and extent of change to forest cover patterns in Soap Creek Valley, Oregon, over the past 500 years. Findings can be placed into three categories: 1) the value of using oral history research methods to perform this study (see Chapter II), 2) documented conditions of Soap Creek Valley forests over time (see Chapters III and V), and 3) theoretical test results (see Chapter IV). This chapter contains brief summaries and conclusions for each type of finding.

RELEVANCE OF ORAL HISTORIES TO DOCUMENTING AND UNDERSTANDING FOREST COVER PATTERNS, 1999.

The use of oral history research methods for interdisciplinary scientific research proved both efficient and productive. The Soap Creek Valley Oral History Series added significant information and documented several informed perspectives regarding the changing forest cover patterns of Soap Creek Valley. Established qualitative research methods for a number of disciplines proved useful for this study, including the fields of archival and historical research, anthropology, feminist studies, information sciences, and the general field of oral history. In particular:

1) Useful oral history research data were credibly gathered and documented using standard qualitative research methods;

2) Oral history subjects often provided significant new details and insights, thus augmenting scientific information from other sources;

3) Data documented by this research provides better understandings of the natural and cultural histories of Soap Creek Valley;

4) Most observations of oral history subjects are consistent with most scientific findings of a similar focus; and

5) Oral history research data is useful for testing theories related to forest history and forest ecology.

SUMMARY OF SOAP CREEK VALLEY FOREST COVER CONDITIONS AND TRENDS, 1500-1999

Soap Creek Valley data show that forest cover patterns have changed constantly and dynamically throughout historical time, and probably throughout prehistoric time as well. Documented history is shown to be useful for describing forest conditions (points in time) and conditional trends (directional changes over periods of time) for Soap Creek Valley. These data indicate that:

1) Current forest cover patterns are primarily a result of prairie and savannah afforestation by Douglas-fir since 1826, and residential and industrial development since 1846;

2) Initial conditions for Soap Creek Valley forests in 1826 included even-aged stands and groves of forest trees less than 230 years of age, with a few individual specimens or groves (most likely oak, possibly Douglas-fir or redcedar) that may have exceeded that age by a few years or decades. Most trees were less than 50 years of age, and most land was bunchgrass and white oak savannah. Headwater conifer stands were likely sources of cedar and hemlock products, yew bows, arrowwood, firewood, game, water, berries, and roots. The general forest cover pattern for 1500 was likely similar to 1826 and may have contained fewer or younger trees, but with a species' distribution similar to early historical time;

3) Current conditions for Soap Creek Valley forests include a blanket of even-aged stands of conifer trees, mostly Douglas-fir—mostly the result of plantation, and/or pre-commercial thinning, and/or commercial thinning

projects—in areas that existed as scattered stands and groves at time of settlement. Most trees are still less than 50 years of age, and there are more trees are in excess of three hundred and (possibly) four hundred years of age than in the 1820s, but fewer total trees exist in excess of one and two hundred years of age;

4) Biodiversity "richness" increased dramatically in Soap Creek Valley during early historical and post-settlement periods, particularly for wild vascular understory plants, herbs, and grasses. Large, wild carnivores were mostly exterminated during the same time and have not been reintroduced. There has been a simultaneous and persistent major shift in species "importance" for thousands of acres of forestland—from oak and bunchgrass savannah to Douglas-fir forests and introduced trees, shrubs, herbs, and grasses;

5) Humans have been primary shapers of Soap Creek Valley forest cover patterns for the past 500 years, and likely the past 10,000 years (or more), as well;

6) Documented trends in forest cover pattern changes include decreased numbers and varieties of large wild carnivores and commercial fur-bearing mammals (since 1811), increased variety of introduced wild plant and animal species (since 1826), increased human population (since 1832), larger numbers and areas of Douglas-fir trees, human residences, road surfaces, ornamental shrubs and grasses, and pet enclosures (since 1845), and decreased agricultural uses (since 1941).

TESTS OF EXISTING THEORIES OF FOREST HISTORY AND ECOLOGY

The principal theoretical tests undertaken with this research are: 1) What were the initial conditions of Soap Creek Valley forests in 1500 and in 1826?; 2) Were prehistoric Soap Creek forests a product of succession or of disturbance?; and 3) Do symbiotic relationships exist between human actions and wildlife populations? Based on the weight of the evidence presented in Chapters III and V, the following conclusions can be made:

1) Botkin's fourth possible condition of western Oregon prehistoric forests (see Chapter IV), that they were "very much the product of intentional actions by the Indians, and that their character was primarily the result of Indian management, and that this management led to more open conditions than would have otherwise occurred" (Botkin 1996), was shown to be true for 1826 and presumed likely to be true for 1500. By substituting the word "people" for "Indians," this condition can also be shown to be true for the 1853, 1929, and 1945 study dates (see Map 25) as well.

2) Climax forests are described as having very old, very large trees of a number of different species and ages. Succession theory holds that different communities of plants and animals occupy the same piece of ground over time, progressing through identifiable stages toward a climax forest condition. There is no evidence that climax forest conditions have existed in Soap Creek Valley during the past 500 years. Rather, forest trees exist in stands of similar ages ("even-aged"), having been established typically within a few months or years of a major site disturbance. There is no evidence of preliminary "seral stage" plant community development prior to tree establishment for Soap Creek forests.

3) A symbiotic interrelationship can be shown to exist on many levels between human actions and wildlife populations over time (see Fig. 35). Identifiable systematic relationships can be shown to exist between available information and local action; cultural values and visual landscapes; forest product harvesting and wildlife habitat conditions, etc., that affect Soap Creek Valley forest cover patterns. These interrelationships are based on local human values that change unpredictably from time to time. As a result of changing values, Soap Creek forest conditions also change from time to time, also in unpredictable ways.

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Zybach, Bob and Md. Shahid Islam 1999. Index to Monographs #01 to #15, Soap Creek Valley, Oregon, Oral History Series, 1978-1999. In preparation. Soap Creek Valley History Project, Monograph #16. Oregon State University Research Forests and College of Forestry, Corvallis, OR.

Zybach, Bob and Patrick Maeder 1996 (September 5). Report on 1996 Inventory of 1955-1977 Oregon Timber Tax Maps. Final report draft prepared for various sponsoring Oregon State agencies and organizations by NW Maps Co., Corvallis, OR: 89 pp.; copy available as of August 30, 1999 on Internet: http://www.New-Albion.com/BZ/NWMC/Reports/OR_Tax_Maps.htm

Zybach, Bob and Janet Meranda 1989. The Town of Tampico, Benton County, Oregon: An Historical and Cultural Resources Survey. Unpublished student report prepared for David Brauner, Oregon State University Department of Anthropology. Copies of the report and appendices are being prepared by authors for Oregon State University Archives, Corvallis, OR: 85 pp. w/appendices.

Zybach, Bob and Janet Meranda 1994. Eugene Glender. Growing Up on a Tampico Family Farm, Benton County, Oregon: 1910-1941. Soap Creek Valley History Project, Monograph #09. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 155 pp.

Zybach, Bob and Cynthia Phelps 1997 (July). Coffin Butte: Cultural Resources Inventory and Historical Overview with Recommendations. Report prepared for Valley Landfills, Inc. by NW Maps Co., Corvallis, OR: 28 pp.

Zybach, Bob and Kevin Sherer 1994. James Hanish. Biographical Sketch and a Tour of Berry Creek, Benton and Polk Counties, Oregon: 1930-1938. Soap Creek Valley History Project, Monograph #06. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 85 pp.

Zybach, Bob and Kevin Sherer 1995. Wanda Marcks Cook. The Story of the Sulphur Springs Stock Ranch, Benton County, Oregon: 1904-1939. Soap Creek Valley History Project, Monograph #12. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 100 pp.

Zybach, Bob, Kevin Sherer and Angela C. Sondenaa 1990. 1990 Oregon State University Research Forests "Human Use" Cultural Resource Inventory. Report prepared for William Atkinson, Jeffrey Garver, and Royal Jackson. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 202 pp.

Zybach, Bob and Angela C. Sondenaa 1994. Charlie Olson. Biographical Sketch and Early History of Sulphur Springs, Benton County, Oregon: 1900-1920. Soap Creek Valley History Project, Monograph #07. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 185 pp.

Zybach, Bob and Neil Vanderburg 1995. Donald Dickey. Family History and Life on Berry Creek, Benton County, Oregon: 1928-1941. Soap Creek Valley History Project, Monograph #03, 2nd printing. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 69 pp.

Zybach, Bob and George B. Wisner 1995. Neil Vanderburg. Family Farming and Saw Milling on Berry Creek, Benton County, Oregon: 1935-1941. Soap Creek Valley History Project, Monograph #08, 2nd printing. Oregon State University Research Forests and College of Forestry, Corvallis, OR: 169 pp.

Zybach, Bob and George B. Wisner 1999 (March 31). Report with Recommendations on Findings of March, 1999 Cultural Resources Survey at Coffin Butte, Benton County, Oregon. Report prepared for Bill Webber, Valley Landfills, Inc., by NW Maps Co., Corvallis, Or: 25 pp.

APPENDICES

APPENDICES
TABLE OF CONTENTS

Appendix A.
Soap Creek Valley Oral History Series Monographs, 1990-1999

This appendix lists the 17 oral history monographs that were created as a basis for this thesis. The appendix is in the form of two tables: the first simply lists the title names and monograph numbers of the 17 Soap Creek Valley Oral History Series; the second provides a summary of total and type of index pages for each monograph.

Table A.1 is taken from Monograph #14. Table A.2 lists the number of concordance file index pages (Zybach & Islam 1999), the number of Table of Content pages—usually arranged and titled thematically and/or chronologically—, and the number of indexed maps, for each monograph. Soap Creek valley index maps were produced from the same base maps used for this thesis (see Maps 2 and 15), and located specific interview points. Not all of the oral histories involved on-site interviews, and only Vanderburg's (1995) required the use of two maps. The total number of index pages, based upon common themes, maps, and words, indicates the relative efficiency in which non-linear access to common data can be obtained for the entire series of monographs. Additional value is that resulting data can be readily scaled in time and place, depending on its purpose or focus.

Table A.1 Monograph numbers and titles

Monograph # 01:	Lorna Grabe. Family history and story of the Soap Creek Schoolhouse Foundation, Benton County, Oregon.
Monograph # 02:	Paul M. Dunn. Biographical sketch and story of the Adair Tract, Benton County, Oregon.
Monograph # 03:	Donald Dickey. Family history and life on Berry Creek, Benton County, Oregon: 1928-1942.
Monograph # 04:	Edward Sekermestrovich. Life at CCC Camp Arboretum, Benton County, Oregon: 1935-1940.
Monograph # 05:	John Jacob and Wilma Rohner. Family farming on Coffin Butte between World Wars, Benton County, Oregon: 1919-1941.
Monograph # 06:	James Hanish. Biographical sketch and a tour of Berry Creek, Benton County, Oregon: 1930-1938.
Monograph # 07:	Charlie Olson. Biographical sketch and early history of Sulphur Springs, Benton County, Oregon: 1900-1920.
Monograph # 08:	Neil Vanderburg. Family farming and saw milling on Berry Creek, Benton County, Oregon: 1935-1941.
Monograph # 09:	Eugene Glender. Growing up on a Tampico family farm, Benton County, Oregon: 1910-1941.
Monograph # 10:	Velma Carter Rawie. A history of the Carter family and the town of Wells, Benton County, Oregon: 1845-1941.
Monograph # 11:	Bessie Murphy. Botanizing in Benton County, Oregon: 1900-1991.
Monograph # 12:	Wanda Marcks Cook. The Story of the Sulphur Springs Stock Ranch, Benton County, Oregon:1904-1939.
Monograph # 13:	William A. Davies. Biographical Sketch and Management of OSU Research Forests. Benton & Polk Counties, Oregon: 1946-1973.
Monograph # 14:	Charles and Norman Hindes. Family History and Story of the Soap Creek Sawmilling and Logging Camp, Benton County, Oregon:1928-1931.
Monograph # 15:	Marvin Rowley. Biographical Sketch and History of OSU Research Forests, Benton and Polk Counties, Oregon: 1950-1987.
Monograph # 16:	Index to Monographs #01-#15. Soap Creek Valley, Benton County, Oregon, Oral History Series.
Monograph # 17:	Documenting Natural and Cultural Resources Research. Soap Creek Valley, Benton County, Oregon, Oral History Series, 1989-1996.

Table A.2 Total oral history pages, tour maps, and index pages.

	Tour Map	Idx	T/C	pp	
Lorna Grabe		0	8	1	77
Paul M. Dunn		0	6	1	53
Donald Dickey		0	11	1	79
Edward Sekermestrovich		0	4	1	41
John Jacob and Wilma Rohner		1	10	2	132
James Hanish		1	9	1	85
Charles Olson		1	14	1	185
Neil Vanderburg		2	17	2	169
Eugene Glender		1	9	1	155
Velma Carter Rawie		0	10	1	100
Bessie Murphy		0	12	1	114
Wanda Marcks Cook		1	10	1	100
William Davies		0	9	2	84
Charles and Norman Hindes		1	8	1	76
Marvin Rowley		1	81	2	175
Index to Monographs #1-#15		1	61	2	189
Documenting Oral Histories Research		1	51	2	136
Totals		11	193	23	1950

Tour Map	Number of indexed tour maps
Idx	Number of concordance file index pages
T/C	Number of table of contents pages
pp.	Total number of numbered pages

Appendix B.
Informant Consent Forms and Filings, 1975-1999

Appendix B. provides copies of the informed consent documents that were developed and used for the oral histories in this research. Signed, original agreements span from 1975 to 1999, and reflect specific research purposes and affiliations for which they were designed. The following copies are a representative selection of original signed agreements that have been altered to protect the confidentiality of participants.

Figure B.1 is a copy of the earliest agreement used to provide published content for the Soap Creek Valley Oral History Series, signed in 1975. Figures B.2 (1979) and B.3 (1980) document the College of Forestry oral history program (Jackson 1980), in cooperation with OSU Horner Museum (Berg 1983; Davies 1997; see Chapters I and II). Fig. B.4 reflects the initiation of the Soap Creek Valley Oral History Series' interviews by OSU Research Forests, in late 1989 and early 1990. Fig. B.5 (eight parts reproduced in 4 pages) is a copy of new "human subject" filings required by OSU, in 1995. This requirement was developed subsequent to the beginning of the Soap Creek Valley History Project, which describes the apparent incongruity of sequence; i.e., today this form would have to be filed in advance of recording agreements, not 5-20 years after their filings. Fig. B.6 is an updated OSU Research Forests' agreement, reflecting recent technological changes in oral history documentation processes, and Fig. B.7 is a current agreement, reflecting potential digital products and possible income from those products.

Fig. B.1 OSU Oral History Program Interviewee Agreement, 1975

OREGON STATE UNIVERSITY

ORAL HISTORY PROGRAM

INTERVIEWEE AGREEMENT

I, ______________________________, in my desire to
(Interviewee, please print)

increase the understanding of the Northwest experience and in view of the historical and scholarly value of this information, voluntarily permit Oregon State University the full use of the information taped during interviews made in connection with the Oregon State University Oral History Program.

I hereby grant all of my rights pertaining to this information to Oregon State University, Corvallis, Oregon, with the understanding that it will be used for research by qualified scholars, for scholarly publications, for university instruction, and other related purposes.

____
Interviewee (signature)

____
Interview Number

Aug. 13th 1975
Date

by Judy Carlson

The interviewee has the right to make conditions for use of the material or specific restrictions on the information given to the Oral History Program of the University with respect to the tape of the interview, the verbatim original typescript, and/or the final retyped and edited transcript.

Fig. B.2 OSU Horner Museum voluntary permission form, 1979

HORNER MUSEUM

OREGON STATE UNIVERSITY

I, ______________________________, knowingly and voluntarily give my permission to Horner Museum and to Royal Jackson and Jennifer Lee to use this tape recording(s), for scholarly and educational purposes, with no restrictions.

____
signed

Feb. 7, 1979
date

Interviewer(s):

Royal Jackson
Jennifer Lee

Date of Interview:

January 25, 1979
January 31, 1979
February 7, 1979

Place of Interview:

Peavy Hall-OSU
Corvallis, Ore

Fig. B.3 OSU Horner Museum Gift and Release Agreement, 1989.

Horner Museum Oregon State University Corvallis, Oregon 97331 (503) 754-[illegible]

Lucy Skjelstad
Director

GIFT AND RELEASE AGREEMENT

I, ______________________, do hereby give and grant to the Horner Museum, Oregon State University, as a donation for such scholarly and educational purposes as the Museum shall determine, the following tape recording(s) and its contents. As an unrestricted gift, I understand that I relinquish any literary rights and legal title which I may possess to the contents of such tape(s) and its transcript(s). This gift does not preclude any use which I may want to make of the information in the recordings myself.

____
Signature

January 26, 1989
Date

Marlene Finley
Interviewer(s)

January 26, 1989
Date(s) of Interview(s)

home: 7555 Valley View Dr., Corvallis
Place of Interview

Fig. B.4 OSU Research Forests Gift and Release Agreement, 1990

OSU RESEARCH FORESTS
OREGON STATE UNIVERSITY
Corvallis, Oregon 97331

GIFT AND RELEASE AGREEMENT

I, ______________________, agree to give and grant to the OSU Research Forests, Oregon State University, as a donation for such research and educational purposes as the University shall determine, the following tape recording(s) and its (their) contents. This gift is unrestricted. As such, I understand that I am giving away any literary rights or legal titles which I may possess to this gift.

This gift does not prohibit any personal use of tape recording transcripts by myself, heirs, or assigns. I retain complete and unrestricted legal use of all information contained in the recording(s).

I am willing to have authorized copies of my transcript distributed to the general public. (Yes ____ No ____) The following conditions may also apply (use back of this form or more paper, if needed):

____

____

____

Signature Date

Interviewer(s) Date(s) of Interview(s)

Place(s) of Interview(s)

NOTES:

BZ/900918

Fig. B.5 OSU Protection of Human Subjects exemption filing, 1995. Page 1 of 4.

OFFICE
OF
DEAN OF RESEARCH

OREGON
STATE
UNIVERSITY

Administrative Services
A312
Corvallis, Oregon
97331-2140

503-737-3437
FAX - 503-737-3093
INTERNET
scanlanr@ccmail.orst.edu

April 27, 1995

Principal Investigator:

The following project has been approved for exemption under the guidelines of Oregon State University's Committee for the Protection of Human Subjects and the U.S. Department of Health and Human Services:

Principal Investigator: Ann Bennett Rogers

Student's Name (if any):

Department: Research Forests

Source of Funding:

Project Title: Oral History Program

Comments:

A copy of this information will be provided to the Chair of the Committee for the Protection of Human Subjects. If questions arise, you may be contacted further.

Sincerely,

Mary E. Nunn
Mary E. Nunn
Sponsored Programs Officer

cc: CPHS Chair

APPLICATION FOR APPROVAL OF THE OSU INSTITUTIONAL REVIEW BOARD (IRB) FOR THE PROTECTION OF HUMAN SUBJECTS

Principal Investigator* Ann Bennett Rogers

Department OSU Research Forests Phone 7456332, ext 8

Project Title Oral History Program

Present or Proposed Source of Funding available College of Forestry funds

Type of Project: X Faculty Research Project

___ Student Project or Thesis*
Student's name ___ Phone ___
Student's mailing address ___

Type of Review Requested: X Exempt ___ Expedited ___ Full Board

The Oregon State University Institutional Review Board (IRB) for the Protection of Human Subjects is charged with the responsibility of reviewing, prior to its initiation, all research involving human subjects. The Board is concerned with justifying the participation of subjects in research and protecting the welfare, rights and privacy of subjects.

All material, including this cover sheet, should be submitted <u>IN DUPLICATE</u> to the Research Office, AdS A312. Please call x7-3670 if you have questions. The following information must be attached to this form with each item identified and addressed separately or the application will be returned without review.

1. A brief description (one paragraph) of the significance of this project in lay terms.
2. A brief description of the methods and procedures to be used during this research project.
3. A description of the benefits (if any) and/or risks to the subjects involved in this research.
4. A description of the subject population, including number of subjects, subject characteristics, and method of selection. Justification is required if the subject population is restricted to one gender or ethnic group.
5. A copy of the informed consent document. The informed consent document must include the pertinent items from the "Basic Elements of Informed Consent" and must be in lay language.
6. A description of the methods by which informed consent will be obtained.
7. A description of the method by which anonymity or confidentiality of the subjects will be maintained.
8. A copy of any questionnaire, survey, testing instrument, etc. (if any) to be used in this project.
9. Information regarding any other approvals which have been or will be obtained (e.g., school districts, hospitals, cooperating institutions).
10. If this is part of a proposal to an outside funding agency, attach a copy of the funding proposal.

Signed Ann Bennett Rogers Date April 20, 1995
Principal Investigator*

*NOTE: Student projects and theses should be submitted by the major professor as Principal Investigator.

Fig. B.5 (cont.), page 2 of 4.

Oral History Program
OSU Research Forests

1. The project under consideration is the Oral History Program at the OSU Research Forests. This program uses oral interviews to document the lives of people important to the College of Forestry and to document past lifeways. The history of the lands now owned by the OSU Research Forests are such that the people who grew up on them can recall and document past land use practices. The collection of oral histories is a major part of the cultural resource management of the OSU Research Forests and aids in compliance with the National Historic Preservation Act, ORS 390.235 to 390.240, and ORS 358.905 to 358.955.

2. Oral histories are tape recorded interviews, usually focusing on a specific geographic area or time period. Interviews are conducted in a variety of settings, including OSU property, or at the subject's residence. Follow up interviews, to clarify issues and to visit places mentioned in interviews, may be conducted. Photo albums are reviewed and sometimes borrowed so that copies of the personal photos which enhance the oral history can be included. The photographs provide a way to identify the changing cultural landscape. These tapes will be transcribed and reviewed by the subject; in some cases they may be published. A preface will be placed on the tape at the beginning of the interview which will identify the interviewer(s) and subject(s), where the interview is conducted, the date of the interview, and a brief statement about the subject which indicates why they are being interviewed. The interviewer will keep written notes during the interview. These notes are to identify collateral materials such as photographs, diaries or other mementos that might be of interest and to identify topics that might be of interest for a later interview. A photograph will be taken of the subject during the interview.

3. The OSU Research Forests benefits from the project by understanding past land-use on the forest. The project also assists in the identification of historic sites in terms of their function, chronological placement, and the people associated with the site. Significantly, the project helps comply with the state and county goals of recognizing Oregon's state heritage.

4. Subjects selected for interview are individuals with ties to OSU Research Forest lands. These include former Forest managers, former Camp Adair officials, and long term local residents,

5. Attached is a copy of the informed consent and examples of types of restrictions that may be applied to the interview.

6. Informed consent will be obtained at the time of the first interview before any taped interview is conducted. The interviewer will identify themselves as a representative of the OSU Research Forests, provide them with their name and an address and phone number, the name and address of the Cultural Resource Manager and the Research Forest Director and how these people can be contacted in the future. The interviewer and the subject will review the consent form. The interviewer shall inform the subject of examples of restrictions that might be attached to the consent form and inform them that these restrictions will also be added at a later date if the subject so desires. If additional interviews are conducted the consent form will be updated to identify those dates.

7. Anonymity and confidentiality will be discussed when consent is obtained. If the subject desires anonymity the subjects wishes will be respected and restrictions to the consent form will reflect this. For example, a transcription may be undertaken with the subject anonymous and the tape sealed, or the tape sealed and no transcription or the tape simply returned to the subject with no further work. The consent form would be amended to reflect any of these restrictions, especially if it occurs after the initial interview.

8. The following background information will be collected at each initial interview:

OSU RESEARCH FORESTS
ORAL HISTORY PERSONAL DATA RECORD

Name__________ Address__________
Date of Birth__________ Place of Birth__________
Year you or your parents came to Oregon __________
Year you came to the area you now live in __________ Place first lived __________
Place emigrated from __________
Mode of travel __________
Route of travel __________
FAMILY: Spouse __________ Date and place married__________
Brothers and sisters (married names)__________

Fig. B.5 (cont.), page 3 of 4.

Father's name ______________________
Date of birth ____________ Place of birth ____________
Date of death ____________ Place of death ____________
Ancestor's homeland ______________________
Major occupation (s) (what, where, when if known)

Mother's Maiden name ______________________
Date of birth ____________ Place of birth ____________
Date of death ____________ Place of death ____________
Ancestor's homeland ______________________
Date married ____________ Place married ____________

Children(narrators)
Name   Date of birth   Place of Birth

Narrators Career Record
Occupation(s) what, where, and when

Schooling

Principal activities and interests other than livelihood

Military service and rank

Additional notes

9. No other approvals are anticipated.

10. Currently this is not part of an outside funding proposal, but future outside funding may be pursued, and a copy of the proposal will be submitted at that time to the OSU Research Office.

OSU RESEARCH FORESTS
OREGON STATE UNIVERSITY
Corvallis, Oregon 97331

GIFT AND RELEASE AGREEMENT

I, ________________________________, **agree to give** and grant to the **OSU Research Forests,** Oregon State University, as a donation for such **research and educational** purposes as the University shall determine, the following **tape recording(s)** and its (their) contents. This gift is unrestricted. As such, **I understand that I am giving away any literary rights or legal titles which I may possess to this gift.**

This gift does not prohibit any personal use of tape recording transcripts by myself, heirs, or assigns. **I retain complete and unrestricted legal use of all information** contained in the recording(s).

I am willing to have authorized copies of my transcript distributed to the general public. (Yes ____ No ____) The following conditions may also apply (use more paper, if needed):

____

____

____

____
Signature   Date

____
Interviewer(s)   Date(s) of Interview(s)

____
Place(s) of Interview(s)

NOTES:

BZ/900918

Fig. B.5 (cont.), page 4 of 4.

Possible Restrictions on Consent Form

Closed, Total Interview:

Except that the entire tape and transcript will be closed to all users until ____________ (date).

Except that the parties hereto agree that the entire tape and transcript will not be made available to anyone other than the parties hereto until ___________ (date).

Closed, Except with Permission:

The interview tape and transcript will not be available to anyone without permission until __________ (date) after which it can be made available for general research.

The parties hereto agree that the entire tape and transcript will not be available to anyone other than the parties hereto until ____________ (date), except with permission of _____________________ narrator.

Closed, Some Pages:

The following transcript pages and the tape relating thereto shall be closed to all users until ____________ (date) except with the express permission of __________________ (narrator). Transcript pages: ___________.

Limited Publication Rights Except with Permission:

It is agreed that the OSU Research Forest will not authorize publication of the transcript or any substantial part thereof during my lifetime without my permission, but the OSU Research Forest may authorize researchers and others to make brief quotations therefrom without my permission.

It is agreed that the OSU Research Forests will not authorize the publication by others of the transcript or any part thereof during my lifetime without my express permission.

Narrator Retains Publication Rights:

I reserve all literary property rights to the interview until ___________ (date), at which time these literary property rights shall vest in the OSU Research Forests.

Fig. B.6 OSU Research Forests Gift and Release Agreement, 1995

OSU RESEARCH FORESTS
OREGON STATE UNIVERSITY
Corvallis, Oregon 97331

GIFT AND RELEASE AGREEMENT

I, ______________, agree to give and grant to the OSU Research Forests, Oregon State University, as a donation for such research and educational purposes as the University shall determine, the following tape recording(s) and its (their) contents. This gift is unrestricted. As such, I understand that I am giving away any literary rights or legal titles which I may possess to this (these) gift(s).

This gift does not prohibit any personal use of the recording(s) or transcript(s) by myself, heirs, or assigns.

The following conditions may also apply

PERMISSION TO BOB ZYBACH AND TO OSU RESEARCH FORESTS FOR DIGITAL & RECORDED USES WITH RESEARCH + EDUCATION PROJECTS USING COMPUTERIZED ENVIRONMENTS, INCLUDING GIS, MULTIMEDIA + CD-ROM FORMATS-

Signature ______ Date Aug 10, 1995

Bob Zybach / Shahid Islam
Interviewer NOTES

8/10/95
Date of Interview

Yachats, Oregon
Place of Interview

Fig. B.7 Agreement to Reproduce and Distribute Oral History, 1998

AGREEMENT TO REPRODUCE AND DISTRIBUTE ORAL HISTORY

Permission is given to Bob Zybach and/or the Benton County (Oregon) Historic Resources Commission to reproduce my oral history memoirs for educational and research purposes. Reproductions may include selected graphics or portions of text.

Printed and electronic versions of the oral history can be reproduced and distributed without charge to schools and to the general public to enhance understanding of Benton County history. If content or reproductions are sold, then an accurate accounting of total sales will be made annually and 10% of all gross income will be paid directly to the Benton County Historical Museum in Philomath, Oregon.

Other agreements and/or restrictions: None
BZ/19980209

______________ 2/9/98
Date

2050 NW 23rd Street
Corvallis, Oregon

______________ 2/9/98
Date

Bob Zybach
321 SW 4th Street
Corvallis, Oregon

Appendix C.
Historical Themes, Markers, and Periods, 1788-1999

Appendix C provides thematic information about Soap Creek Valley time periods in a tabular format. Historical themes (subsequent to documented 1788 accounts of smallpox and metal tools along the Oregon Coast, due west of Soap Creek Valley; see Elliott 1928) related to changing forest cover patterns were identified in the research analysis process (see Chapters II and III). Significant themes identified included patterns and histories of land ownership (Table C.1), land uses (Table C.2), local politics (Table C.3), structural (human) developments (Table C.4), transportation and communications network developments (Table C.5), and wild animal populations management (Table C.6).

Significant events or points in time ("historical markers") for Soap Creek Valley were determined for each theme by review of oral history research data (see Chapter II). Markers were then listed chronologically for the entire 1788-1999 timeframe in each table. Time between markers is defined as a "period" of historical time. Assigned names for each period, the total number of periods, the shortest period, the longest period, and the average length of each period is computed and listed for each table. Results of all six tables are summarized in Table 6 and generalized for all historical Soap Creek Valley themes (related to changing forest cover patterns) in Table 7.

Table C.1 Land Ownership themes, markers, and periods

Historical Markers	Time Period	Length
Kalapuyan Family Claims	1788-1817	30
British/US Reciprocal Agreements	1818-1845	28
OR Donation Land Claims	1846-1858	13
Stock Ranches	1859-1905	56
General Farms	1906-1940	26
Camp Adair	1941-1952	12
Oregon State University	1953-1999	47
Number: 7 Total: 212	**Minimum: 12**	**Average: 30**

Table C. 2 Land Use themes, markers, and periods

Historical Markers	Time Period	Length
Pyroculture	1788-1825	38
Livestock Pasture	1826-1845	20
Ranching	1846-1914	69
Farming	1915-1927	13
Logging	1928-1940	13
Military Training	1941-1952	12
Forestry	1953-1972	20
Home Construction	1973-1999	27
Number: 8 Total: 212	**Minimum: 12**	**Average: 26**

Table C. 3 Local Politics themes, markers, and periods

Historical Markers	Time Period	Length
Kalapuyan Community	1788-1825	38
Hudsons Bay Company	1826-1845	20
Benton County	1846-1858	13
US Civil War	1859-1870	12
Early Oregon	1871-1914	44
World War I	1915-1928	14
Great Depression	1929-1940	12
World War II	1941-1952	12
Oregon State University	1953-1999	47
Number: 9 Total: 212	**Minimum: 12**	**Average: 24**

Table C. 3 Human Development themes, markers, and periods

Historical Markers	Time Period	Length
Camps and Ovens	1788-1825	38
Horse Trails	1826-1845	20
Homes and Wagon Roads	1846-1859	14
Fences, Poles and Crops	1860-1889	30
Sawmills and Rock Roads	1890-1940	51
Rock Quarries and Artillery Ranges	1941-1954	14
Clearcuts and Forest Plantations	1955-1982	28
Housing and Solid Waste Disposal	1983-1999	17
Number: 8 Total: 212	**Minimum: 14**	**Average: 26**

Table C.5 Transportation themes, markers, and periods

Historical Markers	Time Period	Length
Foot and Canoe	1788-1825	38
Horse and Ship	1826-1845	20
Wagon and Steamboat	1846-1879	34
Railroad	1880-1914	35
Automobile	1915-1999	85
Number: 5 Total: 212	**Minimum: 20**	**Average: 42**

Table C.6 Wildlife Management themes, markers, and periods

Historical Markers	Time Period	Length
Bows and Arrows	1788-1810	23
Steel Traps and Guns	1811-1845	35
Livestock Predator Control	1846-1882	37
Exotic Game Animals	1883-1904	22
Seasons and Limits	1905-1972	68
Endangered Species	1973-1999	27
Number: 6 Total: 212	**Minimum: 22**	**Average: 35**

Appendix D.
Landowner Names, Locations, and Types, 1841-1990

This appendix contains four tables that list the names and locations of landowners and other key residents in Soap Creek Valley at specific points in time: 1841 (Table D.1; see Maps 5, 10, 13, 18, 20, and 21); 1853 (Table D.2: see Maps 2, 5, 11, 14, 18, 20, and 22), 1929 (Table D.3; see Maps 2, 9, 15, 16, 20, and 23), and 1990 (Table D.4; see Maps 2, 3, 5, 17, and 24). Each year is represented by a separate table, and tables are subdivided into groups, according to size, type, and/or location of Soap Creek Valley landowners and residents listed. Tables were derived from a computerized database assembled for OSU Research Forests in 1990 (Zybach et al., 1990; Trosper & Zybach 1996).

Table D.1 lists 18 Luckymute and 27 Chapanafa Kalapuyan individuals that were likely alive and frequenting Soap Creek Valley in 1841, at the time of the Wilkes Expedition (Wilkes 1845). Each of these individuals lived until 1860, at least (Whitlow 1988), and were probably counted among the 44 individuals counted during the May, 1851 treat negotiations (Mackey 1974; see Chapter III; Map 13) at Champoeg, Oregon. The spelling and national affiliation of each individual is taken from Grande Ronde Indian Reservation census rolls for the years 1860 (column "C1860") and 1880 (column "C1880"). An asterisk ("*") is used to identify years that the individual was counted. These rolls are the source of the estimated birthdates of individuals (column "DOB"); listing is given in descending order of age, with those individuals most likely to have survived the epidemics of the 1830s (and also, with claims to the longest periods of land ownership and strongest claims to genetic and cultural heritage) listed first.

Table D.2 lists pioneer Soap Creek Valley landowners of 1853, as listed in public land survey records (Hathorn 1854a; 1854b), census rolls (Moore 1947), and local histories (Fagan 1885). Table D.4 lists Depression-era farmers and landowners, as shown on contemporaneous cadastral maps (Metsker 1929a; 1929b; 1929c). Table D.4 lists landowners, as of 1990 (Benton County, Oregon Tax Assessor's Office 1990; Zybach 1990).

Table D.1 Native Kalapuyan landowners and residents, 1841. See Maps 10, 13, 18, 20, and 21. Page 1 of 2.

Chapanafa Nation

Name	DOB	C 1860	C 1888
Elkins, Old	1797		*
Barlow, William "Marysville William"	1807	*	*
Voutrant, John the Baptist	1807		*
Belknap, Lucy	1809	*	
Elkins, Nancy	1817		*
Machell, Louisa	1817	*	
Sangaretta, Joseph	1823	*	*
Heartless, George	1825	*	
Heartless, Nancy	1825	*	
Bill, Alsea	1826		*
Churchill, Betsy	1826	*	
Churchill, Thomas "Muddy Tom"	1826	*	
Sangaretta, Nancy	1827	*	*
Belknap, Rachael	1829	*	
Menard, Elizabeth	1835	*	*
Menard, Peter	1835	*	
Stewart, Lily	1835	*	
Barlow, Jennie	1837		*
Machell, Louis	1837	*	
Machell, Susan	1837	*	
Stewart, James "Muddy Jim"	1837	*	*
Voutrant, Mary Ann	1837		*
Barlow, Mary	1839		*
Menard, John	1841		*
Avery, David "Old David"		*	
Frigginger, John		*	
Heartless, (unknown female)		*	

Number 27

Name As recorded by Whitlow (1988) from 1860 and 1888 Indian census data. A few individuals may be listed under more than one name.

DOB Approximate year of birth, from census, birth, and death records (Whitlow 1988). Actual date may be 1 to 10 (or more) years different.

C 1860 Listed by name, family, and tribal affiliation, on the 1860 Grand Ronde Indian Reservation census.

C 1888 Listed by name, age, family, and tribal affiliation, on the 1888 Grand Ronde Indian Reservation census.

Table D.1 (cont.), page 2 of 2.

Luckymute Nation

Name	DOB	C 1860	C 1888
Wheeler, Samanthy	1816	*	
Wheeler, Peter “Luckiamute Pete”	1836	*	*
Wheeler, Jenny	1836	*	
Jack, Calipooya	1837		*
Wheeler, Jacob “Luckiamute Jake”	1837	*	*
Wheeler, Mary Ann	1837	*	
Davis, David	1839	*	*
Charly, Mary	1841		*
Davis, Sarah Jane		*	*
Durbin, James “Luckiamute Jim”			*
Durbin, Sally		*	
Holman, James		*	
Judson, Charles		*	
Judson, Mary (1)		*	
Judson, Mary (2)		*	
Judson, Sally		*	
Wilson, Judge		*	
Judson, Susan		*	

Number 18

Name As recorded by Whitlow (1988) from 1860 and 1888 Indian census data. A few individuals may be listed under more than one name.

DOB Approximate year of birth, from census, birth, and death records (Whitlow 1988). Actual date may be 1 to 10 (or more) years different.

C 1860 Listed by name, family, and tribal affiliation, on the 1860 Grand Ronde Indian Reservation census.

C 1888 Listed by name, age, family, and tribal affiliation, on the 1888 Grand Ronde Indian Reservation census.

Table D.2 Pioneer landowner names, types, and locations, 1853 (see Maps 2, 11, and 22).

Map #	Name	DLC	Tsp	Rng	Sec	Qrtr
FAMILY						
	Beatty, William F.		10 S.	5 W.	10	SE
	Bell, A. J.		10 S.	5 W.	11	SW
	Bresler, W. S.		10 S.	5 W.	25	NW
	Brown, George W.		10 S.	5 W.	27	NW
	Burns, John		10 S.	5 W.	26	NE
1	Carson, David	45	10 S.	5 W.	25	NW
2	Carson, David Estate	44	10 S.	5 W.	23	SE
3	Davis, David D.	40	10 S.	5 W.	24	NW
4	Garrison, Ephraim	49	10 S.	5 W.	22	SE
	Garrison, William M.		10 S.	5 W.	34	NE
5	Hodges, Monroe	46	10 S.	4 W.	18	SW
6	Hughart, Joseph T.	41	10 S.	5 W.	13	NE
	Hunter, J. C.		10 S.	5 W.	28	SW
	Jackson, Sampson W.		10 S.	5 W.	33	SE
7	Jones, Silas M.	48	10 S.	5 W.	27	NE
	Last, M.		10 S.	5 W.	14	SE
	Miller, James		10 S.	5 W.	12	NW
8	Modie, Jacob	46	10 S.	5 W.	35	NW
9	Roberts, George W.	57	10 S.	4 W.	19	SW
	Roe, M.		10 S.	4 W.	07	SW
	Sheets, Isaac		11 S.	5 W.	05	NE
	Sheets, Zebulon		11 S.	5 W.	04	NW
10	Smith, Green Berry	51	10 S.	5 W.	11	NW
11	Wiles, John	42	10 S.	4 W.	07	SW
	Wood, F.M.		10 S.	5 W.	24	NE
12	Writsman, Alfred	47	10 S.	5 W.	34	NW
13	Writsman, Francis	50	10 S.	5 W.	14	NE
Number: 27						
USA/OREGON						
	School Indemnity		10 S.	5 W.	22	SE
	University Lands		10 S.	5 W.	15	SW
	Unclaimed					
Number: 3						
Total Number: 30						

Map # Corresponds to circled numbers on Map 2.
Name Corresponds to names on Map 11, other legal records.
DLC Refers to OR Donation Land Claim Survey No. (see Map 11)
Tsp PLS Township, South of the Willamette Meridian
Rng PLS Range, West of the Willamette Meridian
Sec PLS Section No.
Qrtr Section quadrant in which bulk of the DLC is located

Table D.3 Depression-Era landowner names and locations, 1929 (see Maps 9 and 23). Page 1 of 2.

Map #	Name	Tsp	Rng	Sec
CORPORATION				
02	Albany State Bank	11 S.	5 W.	09
57	Travelers Ins. Co.	10 S.	4 W.	19
66	Union Central Life Ins. Co.	10 S.	4 W.	19
Number: 3				
FAMILY				
01	Agnew, S. Gert	11 S.	5 W.	08
03	Baker, Abbie	11 S.	5 W.	05
04	Beals, S. E.	10 S.	4 W.	19
05	Blake, E. A.	10 S.	4 W.	30
06	Bradley, B. A.	10 S.	5 W.	24
07	Brown, R. E. L.	10 S.	5 W.	15
08	Bruce, C. J.	10 S.	5 W.	11
09	Burkhart, J. F.	10 S.	4 W.	30
10	Cardi, Solomon	11 S.	5 W.	03
11	Carlson, Peter	11 S.	5 W.	03
12	Carter, Eston A.	10 S.	4 W.	18
13	Cook, Elmer S.	10 S.	5 W.	34
14	Darginest, Leon	11 S.	5 W.	09
15	Davenport, R. J.	11 S.	5 W.	03
16	Dodele, C. G.	10 S.	4 W.	19
17	Farrier, Elizabeth H.	11 S.	5 W.	05
18	Fowler, William	10 S.	5 W.	29
19	Garman, J. D.	11 S.	5 W.	06
20	Glender Brothers	10 S.	5 W.	24
21	Govier, Alva L.	10 S.	5 W.	35
22	Govier, Elmer E.	10 S.	5 W.	26
23	Harwood, Phillip	11 S.	5 W.	02
24	Hoffman, Henry	10 S.	5 W.	25
25	Jackson, E. D.	11 S.	5 W.	08
26	Johnson, D. E.	10 S.	5 W.	28
27	Johnson, Swanty	11 S.	5 W.	05
28	Jorgensen, Bessie, et al.	10 S.	5 W.	32
30	Lawrence, C. W.	10 S.	5 W.	25
31	Leman, V.	10 S.	5 W.	22
32	Logsdon, T. B.	11 S.	5 W.	09
33	Mackey, Ezra	10 S.	5 W.	13
34	Marcks, Helen	10 S.	5 W.	23
35	Matthews, Irving & Frank	10 S.	5 W.	32
36	Matthews, W. H. "Junk"	11 S.	5 W.	05
37	McKenzie, J. E.	10 S.	4 W.	19
38	Olson, John et al.	10 S.	5 W.	32
39	Owens, Kate B.	11 S.	5 W.	05
40	Pearson, M.	10 S.	5 W.	28
41	Quinn, Edward	10 S.	5 W.	28
42	Rohner, Jacob	10 S.	4 W.	18
43	Ruminski, Max F.	11 S.	5 W.	04

Table D.3 (cont.), page 2 of 2.

Map #	Name	Tsp	Rng	Sec
FAMILY (cont.)				
44	Schaffer, B. H.	10 S.	4 W.	19
45	Schulmerich, George	10 S.	4 W.	18
46	Shepherd, John	10 S.	5 W.	14
47	Smith, John C.	10 S.	5 W.	15
48	Smith, Lee C.	10 S.	5 W.	14
49	Smith, Stella	10 S.	5 W.	35
50	Stambaugh, Joseph A.	10 S.	5 W.	13
51	Starker, Thurmon J.	10 S.	5 W.	35
52	Steel, S. N.	10 S.	5 W.	14
53	Stevenson, A. L.	11 S.	5 W.	04
54	Strong, Harold	10 S.	5 W.	28
55	Thompson, R. C.	10 S.	5 W.	35
56	Torgeson, Ethel	10 S.	4 W.	18
60	Wiles, E. F.	10 S.	5 W.	13
61	Wiles, Walter T.	10 S.	4 W.	07
61	Wiles, Walter T.	10 S.	5 W.	24
61	Wiles, Walter T.	11 S.	5 W.	04
61	Wiles, Walter T.	11 S.	5 W.	08
62	Wilson, Effie May	11 S.	5 W.	05
62	Wilson, Effie M.	11 S.	5 W.	06
Number: 57				
UNITED STATES				
59	United States	10 S.	5 W.	29
Number: 1				

Total Number: 61

Map #	Corresponds to uncircled numbers on Maps 9 and 22
Name	Landowner's name (Metsker 1929a; 1929b; 1929c)
Tsp	PLS Township, South of the Willamette Meridian
Rng	PLS Range, West of the Willamette Meridian
Sec	PLS Section No.

Table D.4 Modern landowner names, types, and locations, 1990. See Map 3.
Page 1 of 4.

Map #	Name	Tsp	Rng	Sec	Qrtr	TL #
	CORPORATION					
063	Smith Hill Properties Inc.	10 S.	5 W.	10	SW	300
063	Smith Hill Properties Inc.	10 S.	5 W.	14	NW	300
063	Smith Hill Properties Inc.	10 S.	5 W.	15	NE	200
066	Starker Forests Inc.	11 S.	5 W.	08	NW	100
066	Starker Forests Inc.	11 S.	5 W.	09	NW	200
066	Starker Forests Inc.	10 S.	5 W.	28	NE	100
066	Starker Forests Inc.	10 S.	5 W.	29	SE	200
066	Starker Forests Inc.	10 S.	5 W.	29	SE	201
066	Starker Forests Inc.	10 S.	5 W.	32	NE	100
066	Starker Forests Inc.	10 S.	5 W.	32	NE	101
066	Starker Forests Inc.	10 S.	5 W.	33	NW	100
066	Starker Forests, Inc.	10 S.	5 W.	28	NW	200
067	Starker, Elizabeth	11 S.	5 W.	03	NW	200
067	Starker, Elizabeth	11 S.	5 W.	04	NW	100
067	Starker, Elizabeth	10 S.	5 W.	27	SW	200
067	Starker, Elizabeth	10 S.	5 W.	34	SE	2600
067	Starker, Elizabeth	10 S.	5 W.	34	NW	1100
071	United Presbyterian Church	10 S.	5 W.	13	NW	500
073	Valley Landfills Inc.	10 S.	5 W.	13	SE	1000
073	Valley Landfills Inc.	10 S.	4 W.	18	NW	801
073	Valley Landfills Inc.	10 S.	4 W.	18	SW	1107
073	Valley Landfills Inc.	10 S.	4 W.	18	NW	301
073	Valley Landfills Inc.	10 S.	4 W.	18	SW	1200
073	Valley Landfills Inc.	10 S.	5 W.	24	NE	103
078	Western Timber Co.	10 S.	5 W.	32	NW	200
079	Willamette Industries Inc	10 S.	5 W.	35	NW	200
079	Willamette Industries Inc.	10 S.	5 W.	26	SW	400
124	Starker, Elizabeth	11 S.	5 W.	04	NE	600
Number: 6						
	FAMILY					
001	Andrews, Andor & Genevieve	10 S.	5 W.	14	SE	124
001	Andrews, Andor & Genevieve	10 S.	5 W.	14	NE	190
002	Andrews, Genevieve	10 S.	5 W.	14	SE	100
003	Andrews, Melvin	10 S.	5 W.	14	NE	120
003	Andrews, Melvin	10 S.	5 W.	14	SE	122
004	Andrews, Melvin & Janet	10 S.	5 W.	14	NE	115
004	Andrews, Melvin & Janet	10 S.	5 W.	14	NE	101
005	Bauman, Harold & Mary	10 S.	5 W.	32	SE	300
006	Beatty, Faris	10 S.	5 W.	13	NW	501
007	Benneth, David	10 S.	5 W.	13	NE	203
008	Bischof, Rudy & Sue	10 S.	5 W.	25	NW	305
009	Brenneman, Rod & Audrey	10 S.	4 W.	19	SW	
010	Briskey, William & Terri	10 S.	5 W.	13	NE	400
011	Bunn, Dan E.	10 S.	4 W.	18	SW	1100
012	Burch, Robert & Patricia	10 S.	5 W.	13	SW	600
013	Cadart Richard & Odette	10 S.	5 W.	34	NW	2300

Table D.4 (cont.), page 2 of 4.

Map #	Name	Tsp	Rng	Sec	Qrtr	TL #
	FAMILY (cont.)					
014	Carlson, Theodore & Swanhild	10 S.	4 W.	19	SW	400
015	Cornelius, Grant & Gail	10 S.	5 W.	25	NE	100
016	Cornelius, Timothy	10 S.	5 W.	25	NE	103
017	Cornell, Bryan & Jennie	10 S.	5 W.	14	NW	2500
018	Croeni, Curtis & Deborah	10 S.	5 W.	34	NW	2400
019	Daily, Helen	10 S.	5 W.	34	NE	100
020	Danton, Grace	10 S.	5 W.	12	SE	400
021	Larsen, David	10 S.	5 W.	34	SW	600
022	Deardorff, Shirley & Donald	10 S.	5 W.	34	NW	2700
023	Denoma, John & Dagnie	10 S.	5 W.	13	NE	300
024	Ellis, Gloria	10 S.	5 W.	24	NE	190
025	Fleck, Stephen & Louise	10 S.	5 W.	25	NW	304
026	Gerding, Richard & Sandra	10 S.	4 W.	18	NW	200
027	Hackleman, David	10 S.	5 W.	13	NE	200
028	Hackleman, David & Debra	10 S.	5 W.	13	NE	201
029	Hancock, Astrid	10 S.	5 W.	14	SW	900
031	Holmes, Richard & Charley	10 S.	4 W.	19	SW	800
032	Jeffers, Shirley	10 S.	5 W.	24	SE	105
033	Chambers, Florence	10 S.	5 W.	34	SW	400
034	Johnson, Bruce & Cheryl	11 S.	5 W.	03	NW	501
034	Johnson, Bruce & Cheryl	11 S.	5 W.	03	NW	1000
034	Johnson, Bruce & Cheryl	11 S.	5 W.	04	NE	100
035	Kingsley, Richard	10 S.	5 W.	13	NE	202
036	Kipper, Robert & Richard	10 S.	4 W.	19	NW	402
037	Lantz, Richard & Carol	10 S.	5 W.	34	NW	900
038	Liday, Karen G.	10 S.	4 W.	18	NW	300
039	Luebbert, Edwin & Mona	10 S.	5 W.	25	NW	300
040	Maine, Elmore & Jackie	10 S.	5 W.	14	NW	100
041	Mankin, Buddy & Donna	10 S.	5 W.	12	NW	602
042	McGee, Charles & Gloria	10 S.	5 W.	13	SE	800
042	McGee, Charles & Gloria	10 S.	5 W.	24	NE	200
043	Moore, Dale & Ann	10 S.	5 W.	14	NW	200
044	Newman, S. & Hawk, A.	10 S.	4 W.	30	NW	100
045	Nibler, W G & Rosemary	11 S.	5 W.	05	NE	100
046	OBrien, Jo II, Je, Jo III, & L	11 S.	5 W.	05	NE	200
047	Olson, Irvin & Leota	10 S.	5 W.	24	NE	104
048	Opoien, Jeffrey & Kathleen	10 S.	4 W.	30	NW	602
054	Portz, Edward & Joann	10 S.	5 W.	14	NE	104
055	Reinhard, Robert & Carol	11 S.	5 W.	03	NW	1100
055	Reinhard, Robert & Carol	10 S.	5 W.	34	SW	700
056	Roth, Jean	10 S.	5 W.	24	SE	600
056	Roth, Jean	10 S.	5 W.	25	NW	200
057	Schaeffer, Delbert & Sandra	10 S.	5 W.	24	NE	106
058	Schell, Samuel	10 S.	5 W.	34	NE	2700
059	Schmidt, David	10 S.	5 W.	11	SE	100
059	Schmidt, David	10 S.	5 W.	12	SW	600
060	Schwanke, Howard & Hannah	10 S.	5 W.	11	NE	101
061	Shine, Kevin & Karie	10 S.	4 W.	30	NW	600

Table D.4 (cont.), page 3 of 4.

Map #	Name	Tsp	Rng	Sec	Qrtr	TL #
	FAMILY (cont.)					
062	Shine, Robert & Catherine	10 S.	4 W.	30	NW	601
064	Smith, Alvin & Gladys	11 S.	5 W.	05	NE	1100
065	Denison, William & Margaret	11 S.	5 W.	04	NW	401
068	Tillotson, Ruth	10 S.	5 W.	12	NW	401
069	Trotta, John & Elaine	10 S.	5 W.	13	SW	601
074	Voss, Wesley & Aileen	10 S.	4 W.	07	SW	300
074	Voss, Wesley & Aileen	10 S.	5 W.	13	NE	100
075	Walker, Jon & Imogenen	11 S.	5 W.	05	NE	400
076	Weaver, Gary & Aundria	10 S.	5 W.	13	NW	502
080	Wold, Ronald	10 S.	5 W.	34	SW	300
081	Wolfson, Murray & Betty	10 S.	5 W.	34	NW	1400
082	Yates, Barbara	11 S.	5 W.	04	NE	200
084	Morrison, Clifford & Susan	11 S.	5 W.	05	SE	1990
085	Neidig, James & Louise	10 S.	5 W.	34	SW	500
086	Pruden, Mary	11 S.	5 W.	04	NW	400
102	Hardenbrook, Glenn & Mary	10 S.	4 W.	19	SW	1800
102	Hardenbrook, Glenn & Mary	10 S.	4 W.	19	NW	1600
105	Powell, Byron & Charlotte	10 S.	4 W.	18	SW	1106
109	Webb, Kenneth & Cheryl	10 S.	4 W.	19	NW	1500
Number: 72						
	LOTS					
900	7 Lots (7 acres)	10 S.	4 W.	07	SW	0
901	14 Lots (4 acres)	10 S.	4 W.	18	NW	0
902	15 Lots (4 acres)	10 S.	4 W.	19	NW	0
903	16 Lots (3 acres)	10 S.	4 W.	30	NW	0
904	4 Lots (4 acres)	10 S.	5 W.	13	NE	0
905	37 Lots (4 acres)	10 S.	5 W.	14	NW	0
906	3 Lots (4 acres)	10 S.	5 W.	24	NE	0
907	4 Lots (3 acres)	10 S.	5 W.	25	NW	0
908	18 Lots (5 acres)	10 S.	5 W.	26	NE	0
910	46 Lots (4 acres)	10 S.	5 W.	34	NW	0
911	9 Lots (4 acres)	11 S.	5 W.	03	NW	0
912	41 Lots (4 acres)	11 S.	5 W.	04	NW	0
913	12 Lots (3 acres)	11 S.	5 W.	05	NE	0
Number: 226						
	OREGON					
049	Oregon	11 S.	5 W.	02	NW	700
049	Oregon	11 S.	5 W.	03	NE	100
052	Oregon Highway Dept.	10 S.	4 W.	18	NW	800
053	OSU Forestry School	11 S.	5 W.	05	NW	300
053	OSU Forestry School	11 S.	5 W.	08	NW	200
053	OSU Forestry School	11 S.	5 W.	08	SW	300
053	OSU Forestry School	11 S.	5 W.	09	NW	100
053	OSU OSC	10 S.	5 W.	13	SW	700
053	OSU OSC	10 S.	5 W.	26	NW	200
053	OSU OSC	10 S.	5 W.	34	SE	2800

Table D.4 (cont.), page 4 of 4.

Map #	Name	Tsp	Rng	Sec	Qrtr	TL #
	OREGON (cont.)					
053	OSU OSC	10 S.	5 W.	35	NE	100
053	OSU State Board Higher Ed	11 S.	5 W.	04	SW	100
053	OSU State Board Higher Ed	10 S.	5 W.	14	SW	700
053	OSU State Board Higher Ed	10 S.	5 W.	15	SW	100
053	OSU State Board Higher Ed	10 S.	5 W.	22	NW	100
053	OSU State Board Higher Ed	10 S.	5 W.	23	NW	100
053	OSU State Board Higher Ed	10 S.	5 W.	24	SE	500
053	OSU State Board Higher Ed	10 S.	5 W.	24	NW	300
053	OSU State Board Higher Ed	10 S.	5 W.	25	SW	500
053	OSU State Board Higher Ed	10 S.	5 W.	25	NE	400
053	OSU State Board Higher Ed	10 S.	5 W.	27	NW	100
053	OSU State Board of Forestry	11 S.	5 W.	06	NW	100
053	OSU State Board of Higher Ed	11 S.	5 W.	07	NE	100
Number: 4						
	UNITED STATES					
070	US National Guard	10 S.	5 W.	10	SE	100
070	US National Guard	10 S.	5 W.	11	NW	200
072	USA	10 S.	5 W.	29	SW	300
Number: 2						
	XLOT					
077	10-4-19B	10 S.	4 W.	19	NW	1500
084	10-5-SE	10 S.	5 W.	05	SE	
???	10-4-19B	10 S.	4 W.	19	NW	1600
Number: 3						

Total Number: 313

Map #	Corresponds to uncircled numbers on Map 3
Name	Landowner's name (Benton County, Oregon, Tax Assessor's Office 1990)
Tsp	PLS Township, South of the Willamette Meridian
Rng	PLS Range, West of the Willamette Meridian
Sec	PLS Section No.
TL#	Current Tax Lot No. (Benton County, Oregon, Tax Assessor's Office 1990)

XLOT Subdivisions for which inadequate or contradictory information exists

Appendix E.
Native, Extirpated, and Exotic Wildlife Species, 1500-1999

This appendix lists wild terrestrial vertebrate and vascular plant species known to exist, or believed to have existed, in Soap Creek Valley during the past 500 years (see Chapter III). The appendix is comprised of four tables: a list of native terrestrial vertebrates (Table E.1; see Fig. 14); a list of introduced and extirpated wild terrestrial vertebrates (Table E.2; see Fig. 13); a list of native vascular plants (Table E.3; see Figs. 17, 18, 20, and 21); and a list of wild vascular plants introduced since 1825 (Table E.4; see Figs. 16 and 19). These tables are summarized in the text as Tables 12 and 13. They were derived from two databases assembled for OSU Research Forests between 1990 and 1995 (Trosper & Zybach 1996).

Table E.1 was compiled from existing texts (Storm 1941; Nussbaum, Brodie, & Storm 1983; Sondenaa 1991; Ingles 1992; Glender 1994; Olson 1994) and expert opinion (Sondenaa 1989: personal communication; Chambers, C. 1993: personal communication). Species are grouped by order and listed alphabetically by family and Latin name. Local names (see Chapter I) are given as they are used in the text.

Table E.2 was compiled by the same methods, and by using the same basic sources, as Table E.1. Historical texts were also used (e.g., Wilkes 1845; Fagan 1885; Douglas 1905; Poesch 1961) to identify extirpated animals. Species are grouped as locally extinct (extirpated) and as introduced since 1805 (exotic). They are listed alphabetically by family and Latin name. Local names are given as they are used in the text.

Table E.3 was compiled from existing texts (Haskins 1934; Hall & Alabeck 1982; Comacho & Otting 1993; Murphy 1995; Comacho & Otting 1997) and expert opinion (Chambers, K. 1990: personal communication; Hays 1990: personal communication; Sondenaa 1989: personal communication). Plant species are grouped by type and listed alphabetically by local name (see Chapter I). Listing order is not standard, but makes text and oral history references to local names easier to locate.

Table E.4 was compiled in the same manner and from the same sources as Table E.3, but with additional consultations (Compton 1990: personal communication; Gu 1990: personal communication). Plants are grouped in the same manner as Table E.3, but are listed alphabetically by family and Latin name.

Table E.1 Native terrestrial vertebrates, 1805-1999. Page 1 of 2.

Local Name	Family	Species
AMPHIBIANS		
Salamander, northwestern	Ambystomatidae	Ambystoma gracilis
Salamander, long-toed	Ambystomatidae	Ambystoma macrodactylum
Salamander, Pacific giant	Dicamptodontidae	Dicamptodon ensatos
Frog, Pacific tree	Hylidae	Hyla regilla
Salamander, Ensatina	Plethodontidae	Ensatina erscholtzii
Frog, red-legged	Ranidae	Rana aurora
Newt, rough-skinned	Salamandridae	Taricha granulosa
NUMBER: 7		
CARNIVORES		
Coyote	Canidae	Canis latrans
Fox, gray	Canidae	Urocyon cinereoargenteus
Cougar	Felidae	Felis concolor
Bobcat	Felidae	Lynx rufus
Otter, river	Mustelidae	Lutra canadensis
Skunk, striped	Mustelidae	Mephitis mephitis
Ermine	Mustelidae	Mustela erminea
Weasel, long-tailed	Mustelidae	Mustela frenata
Mink	Mustelidae	Mustela vison
Skunk, spotted	Mustelidae	Spilogale gracilis
Raccoon	Procyonidae	Procyon lotor
Bear, black	Ursidae	Ursus americanus
NUMBER: 12		
HOOFED		
Elk, Roosevelt	Cervidae	Cervus elaphus
Deer, blacktailed	Cervidae	Odocoileus hemionus
NUMBER: 2		
INSECTIVORES		
Shrew, Pacific water	Soricidae	Sorex bendirei
Shrew, Pacific	Soricidae	Sorex pacificus
Shrew, water	Soricidae	Sorex palustris
Shrew, Trowbridge’s	Soricidae	Sorex trowbridgii
Shrew, vagrans	Soricidae	Sorex vagrans
Mole, shrew-mole	Talpidae	Neurotrichus gibbsii
Mole, coast	Talpidae	Scapanus orarius
Mole, Townsend’s	Talpidae	Scapanus townsendii
NUMBER: 8		
RABBITS AND HARES		
Rabbit, snowshoe hare	Leporidae	Lepus americanus
Rabbit, brush bunny	Leporidae	Sylvilagus bachmani
Rabbit, Nuttall cottontail	Leporidae	Sylvilagus nuttallii
NUMBER: 3		

Table E.1 (cont.), Page 2 of 2.

Local Name	Family	Species
RODENTS		
Beaver	Castoridae	Castor canadensis
Mouse, kangaroo	Dipodidae	Zapus trinotatus
Porcupine	Erithizontidae	Erethizon dorsatum
Gopher, camas pocket	Geomyidae	Thomomys bulbivorus
Gopher, western pocket	Geomyidae	Thomomys mazama
Vole, red-backed	Muridae	Clethrionomys californicus
Vole, long-tailed	Muridae	Microtus longicaudus
Vole, gray-tailed	Muridae	Microtus montanus
Vole, creeping	Muridae	Microtus oregoni
Vole, Townsend's	Muridae	Microtus townsendii
Woodrat, bushy-tailed	Muridae	Neotoma cinerea
Woodrat, dusky-footed	Muridae	Neotoma fuscipes
Muskrat	Muridae	Ondatra zibethicus
Mouse, deer	Muridae	Peromyscus maniculatus
Vole, white-footed	Muridae	Phenacomys albipes
Vole, red tree	Muridae	Phenacomys longicaudus
Squirrel, northern flying	Sciuridae	Glaucomys sabrinus
Squirrel, western gray	Sciuridae	Sciurus griseus
Squirrel, gray digger	Sciuridae	Spermophilus beecheyi
Chipmunk, Townsend's	Sciuridae	Tamias townsendii
Squirrel, Douglas'	Sciuridae	Tamiasciurus douglasii
NUMBER: 21		
REPTILES		
Lizard, northern alligator	Anguidae	Elgaria coerulea
Snake, rubber boa	Boidae	Charina bottae
Snake, racer	Colubridae	Coluber constrictor
Snake, sharptail	Colubridae	Contia tenuis
Snake, ringneck	Colubridae	Diadophis punctatus
Snake, bullsnake	Colubridae	Pituophis melanoleucus
Snake, northwestern garter	Colubridae	Thamnophis ordinoides
Snake, garter	Colubridae	Thamnophis sirtalis
Turtle, western pond	Emydidae	Clemmys Marmorata
Lizard, western fence	Iguanidae	Sceloperus
Lizard, western skink	Scincidae	Eumeces skiltonianus
NUMBER: 11		

TOTAL NUMBER: 64

Table E.2 Exotic and exirpated terrestrial vertebrates, 1805-1999

Local Name #1	Family	Species
EXOTIC		
Fox, red	Canidae	Vulpes vulpes
Nutria	Capromyidae	Mycastor coypus
Possum	Didelphidae	Didelphis virginiana
Rabbit, eastern cottontail	Leporidae	Sylvilagus floridanus
Mouse, house	Muridae	Mus musculus
Rat, Norway	Muridae	Rattus norvegicus
Frog, bullfrog	Ranidae	Rana catasbiana
Number: 7		
EXTIRPATED		
Boomer*	Aplodontidae	Aplodontia rufa
Wolf, timber	Canidae	Canis lupus
Deer, whitetailed	Cervidae	Odocoileus virginianus
Rabbit, blacktailed hare	Leporidae	Lepus californicus
Fisher	Mustelidae	Martes pennanti
Wolverine	Mustilidae	Gulo gulo
Bear, grizzly	Ursidae	Ursus arctos
Rattlesnake, western	Viperidae	Crotalus viridis
Number: 8		

Boomer* It could not be determined if boomer, also known as "mountain beaver," had ever established colonies in Soap Creek Valley. No physical evidence of their existence in The Valley could be found, and no interviewee recalled seeing or hearing of these animals in the general vicinity. They are listed here because Soap Creek Valley is considered to be within their "natural range" (Sondenaa 1991).

Table E.3 Native vascular plants, 1500-1999. Page 1 of 8.

Local Name	Family	Latin Name
FERN		
Fern, Bladder	Dryopteridaceae	Cystopteris fragilis
Fern, Bracken	Dennstaedtiacea	Pteridium aquilinum
Fern, Deer	Blechnaceae	Blechnum spicant
Fern, Lady	Dryopteridaceae	Athyrium felix-femina
Fern, Licorice-root	Polypodiaceae	Polypodium glycyrrhiza
Fern, Maidenhair	Pteridaceae	Adiantum aleuticum pedatum
Fern, Shield	Dryopteridaceae	Dryopteris arguta
Fern, Sword	Dryopteridaceae	Polystichum munitum
NUMBER: 8		
GRAMINOID		
Cat-tail	Typhaceae	Typha latifolia
NUMBER: 1		
GRASS		
Barley, Meadow	Poaceae	Hordeum brachyantherum
Bentgrass	Poaceae	Agrostis exarata
Bentgrass, Hall's	Poaceae	Agrostis hallii
Bentgrass, Rough	Poaceae	Agrostis scabra
Bluegrass, Loose-Flowered	Poaceae	Poa laxiflora
Bluegrass, Weak	Poaceae	Poa marcida
Brome, California	Poaceae	Bromus carinatus
Brome, Columbia	Poaceae	Bromus vugaris
Brome, Pacific	Poaceae	Bromus pacificus
Fescue, Bearded	Poaceae	Festuca subulata
Fescue, California	Poaceae	Festuca californica
Fescue, Crinkle Awn	Poaceae	Festuca subuliflora
Fescue, Idaho	Poaceae	Festuca ovina ingrata
Fescue, Western	Poaceae	Festuca occidentalis
Hairgrass, Annual	Poaceae	Deschampsia danthonioides
Hairgrass, Tufted	Poaceae	Deschampsia cespitosa
Junegrass, Prairie	Poaceae	Koeleria macrantha
Mannagrass, Tall	Poaceae	Glyceria elata
Needlegrass, Lemmon's	Poaceae	Achnatherum lemmonii
Oatgrass, California	Poaceae	Danthonia californica
Oniongrass, Alaskan	Poaceae	Melica subulata
Rye, Blue Wild	Poaceae	Lymus glaucus
Squirreltail, Big	Poaceae	Elymus multisetus
Trisetum, Tall	Poaceae	Trisetum canescens
Wheatgrass, Slender	Poaceae	Agropyron caninum
Woodreed	Poaceae	Cinna latifolia
NUMBER: 26		

Table E.3 (cont.), page 2 of 8.

Local Name	Family	Latin Name
HERB		
Agoseris, Large-Flowered	Asteraceae	Agoseris grandiflora
Anemone, Bog	Ranunculaceae	Anemone oregana
Anemone, Lyall’s	Ranunculaceae	Anemone lyallii
Anemone, Three-leaf	Ranunculaceae	Anemone deltoidea
Anise, Sweet	Apiaceae	Osmorhiza occidentalis
Arrowwood, Indian	Rosaceae	Holodiscus discolor
Aster, Douglas’	Asteraceae	Aster subspicatus
Avens, Largeleaved	Rosaceae	Geum macrophyllum
Balsamroot, Deltoid	Asteraceae	Balsamorhiza deltoidea
Baneberry, Red	Ranunculaceae	Actaea rubra
Bedstraw, Oregon	Rubiaceae	Galium oreganum
Bedstraw, Sweet-scented	Rubiaceae	Galium triflorum
Betony, Great	Lamiaceae	Stachys cooleyae
Betony, Mexican	Lamiaceae	Stachys mexicana
Bigroot, Oregon	Cucurbitaceae	Marah oreganus
Bittercress, Little Wester	Brassicaceae	Cardamine oligosperma
Bittercress, Pennsylvania	Brassicaceae	Cardamine pensylvanica
Bleeding Hearts	Fumariaceae	Dicentra formosa
Borage	Boraginaceae	Borago officianlis
Brodiaea, Elegant	Liliaceae	Brodiaea elegans
Brodiaea, Harvest	Liliaceae	Brodiaea coronaria
Broom, Chapparal	Asteraceae	Baccharis pitularis
Bugbane, Tall	Ranunculaceae	Cimicifuga elata
Bur-reed, Simplestem	Sparganiaceae	Sparganium emersum
Buttercup, Little	Ranunculaceae	Ranunculus uncinata
Buttercup, Spiny-Fruit	Ranunculaceae	Ranunculus maricatus
Buttercup, Straight-beaked	Ranunculaceae	Ranunculus orthohynchus
Buttercup, Western	Ranunculaceae	Ranunculus occidentalis
Butterweed, Puget	Asteraceae	Senecio macounii
Camas	Liliaceae	Camassia quamash
Camas, Death	Liliaceae	Zigadenus venenosus
Carrot, American	Apiaceae	Daucus pusillus
Cat’s ear, Tolmie’s	Liliaceae	Calochortus tolmiei
Cicely, Mountain Sweet-	Apiaceae	Osmorhiza chilensis
Cinquefoil, Five-Finger	Rosaceae	Potentilla gracilis
Cinquefoil, Sticky	Rosaceae	Potentilla glandulosa
Clarkia, Lindely’s	Onagraceae	Clarkia amoena
Clarkia, Rhombic-petaled	Onagraceae	Clarkia rhomboidea
Clarkia, Small-Flowered	Onagraceae	Clarkia quadrivulnera
Clarkia, Twiggy	Onagraceae	Clarkia viminea
Cleavers	Rubiaceae	Galium aparine
Clover, Pinole	Fabaceae	Trifolium bifidum
Clover, Spanish	Fabaceae	Lotus purshiana
Clover, Thimble	Fabaceae	Trifolium microdon
Clover, Tomcat	Fabaceae	Trifolium tridentatum
Clover, Wooly	Fabaceae	Trifolium microcephalum
Collinsia, Bigflower	Scrophulariaceae	Collinsia grandiflora
Collinsia, Small-Flowered	Scrophulariaceae	Collinsia parvifolia
Collomia, Bigflower	Polemoniaceae	Collomia grandiflora

Table E.3 (cont.), page 3 of 8.

Local Name	Family	Latin Name
HERB (CONT.)		
Collomia, Varied-Leaf	Polemoniaceae	Collomia heterophylla
Coltsfoot, Sweet	Asteraceae	Petasites frigidus
Columbine, Red	Ranunculaceae	Aquilegia formosa
Coralroot, Spotted	Orchidaceae	Corallorhiza maculata
Coralroot, Striped	Orchidaceae	Corallorhiza striata
Cress, Wood Bitter	Brassicaceae	Cardamine angulata
Cryptantha, Common	Boraginaceae	Cryptantha intermedia
Cudweed, Lowland	Asteraceae	Gnaphalium palustre
Daisy, Willamette	Asteraceae	Erigeron decumbens
Dock, Willow	Polygonaceae	Rumex salicifolius
Dogbane, Spreading	Apocynaceae	Apocynum androsaemifolium
Downingia, Douglas's	Campanulaceae	Downingia elegans
Duckfoot	Berberidaceae	Vancouveria hexandra
Duckweed, Large	Lemnaceae	Spirodela polyrhiza
Fairy-bell, Hooker	Liliaceae	Disporum hookeri
Fairy-bell, Smith	Liliaceae	Disporum smithii
Fireweed	Onagraceae	Epilobium angustifolium
Flax, Perennial	Linaceae	Linum lewisii
Fleabane, Showy	Asteraceae	Erigeron speciosus
Foamflower	Saxifragaceae	Tiarella trifoliata
Forget-Me-Not, Small Flower	Boraginaceae	Myosotis laxa
Four-O'Clock, MacFarlane's	Nyctaginaceae	Mirabilis macfarlanei
Fringecup	Saxifragaceae	Tellima grandiflora
Fringepod	Brassicaceae	Thysanocarpus curvipes
Geranium, Bicknell's	Geraniaceae	Geranium bicknellii
Geranium, Oregon	Geraniaceae	Geranium oreganum
Ginger, Wild	Aristolochiaceae	Asarum caudatum
Goldenrod, Canadian	Asteraceae	Solidago canadensis
Goldthread, Western	Ranunculaceae	Coptis laciniata
Gumweed	Asteraceae	Madia sativa
Gumweed, Willamette	Asteraceae	Grindelia integrifolia
Harebell, Scouler's	Campanulaceae	Campanula scouleri
Hawkweed, White-Flowered	Asteraceae	Hieracium albiflorum
Helibore, California False	Liliaceae	Veratum californicum
Helibore, Siskiyou False	Liliaceae	Veratrum insolitum
Heuchera, Small-flowered	Saxifragaceae	Heuchera micrantha
Horsetail, Field	Equisetaceae	Equisetum arvense
Horstail, Giant	Equisetaceae	Equisetum telmateia
Hound's Tongue, Pacific	Boraginaceae	Cynoglossum grande
Hyacinth, Brody's	Liliaceae	Brodiaea hyacintha
Indian Pipe	Ericaceae	Monotropa uniflora
Iris, Blue-eyed Grass	Iridaceae	Sisyrinchium angustifolia
Iris, Oregon Flag	Iridaceae	Iris tenax
Larkspur, Menziesies'	Ranunculaceae	Delphinium menziesii
Larkspur, Peacock	Ranunculaceae	Delphinium pavonaceum
Larkspur, Poison	Ranunculaceae	Delphinium trolliifolium
Lentil, Water	Lemnaceae	Lemna minor
Lettuce, Malheur Wire	Asteraceae	Stephanomeria malheurensis
Lily, Oregon	Liliaceae	Erythonium oregonum

Table E.3 (cont.), page 4 of 8.

Local Name	Family	Latin Name
HERB (CONT.)		
Lily-Of-The-Valley, False	Liliaceae	Maianthemum dilatatum
Linanthus, Bicolor	Polemoniaceae	Linanthus bicolor
Lomatium, Barestem	Apiaceae	Lomatium nudicaule
Lomatium, Cook's	Apiaceae	Lomatium cookii
Lomatium, Fine-Leaf	Apiaceae	Lomatium utriculatum
Lomatium, Nine-leaf	Apiaceae	Lomatium triternatum
Lotus, Little-Flowered	Fabaceae	Lotus micranthus
Lotus, Meadow	Fabaceae	Lotus denticulatus
Lotus, Nevada	Fabaceae	Lotus nevadensis
Lovage	Apiaceae	Ligusticum apiifolium
Luina, Silvercrown	Asteraceae	Luina nardosmia
Lupine, Broadleaf	Fabaceae	Lupinus latifolius
Lupine, Kincaid's	Fabaceae	Lupinus sulphureus var. kincaidii
Lupine, Large	Fabaceae	Lupinus polyphyllus
Lupine, Small-Flowered	Fabaceae	Lupinus micranthus
Mallow, Meadow	Malvaceae	Sidalcea campestris
Mallow, Nelson's	Malvaceae	Sidalcea nelsoniana
Mallow, Rose Checker-	Malvaceae	Sidalcea virgata
Meadow-rue, Western	Ranunculaceae	Thalictrum occidentale
Microsteris, Pink	Polemoniaceae	Microsteris gracilis
Miner's Lettuce	Portulacaceae	Montia perfoliata
Mission Bells	Liliaceae	Fritillaria lanceolata
Mistletoe	Loranthaceae	Phoradendron flavescens
Mistmaiden, Sitka	Hydrophyllaceae	Romanzoffia sitchensis
Mitrewort, Star-Shaped	Saxifragaceae	Mitella caulescens
Monkey Flower, Slimy	Scrophulariaceae	Mimulus moschatus
Monkeyflower, Three-Colored	Scrophulariaceae	Mimulus tricolor
Monkeyflower, Tooth-leaved	Scrophulariaceae	Mimulus dentatus
Monkeyflower, Yellow	Scrophulariaceae	Mimulus guttatus
Montia, Dwarf	Portulacaceae	Monte linearis
Montia, Siberian	Portulacaceae	Montia siberica
Morning-Glory	Convolvulaceae	Convolvulus nyctagineus
Nemophila, Small-Flowered	Hydrophyllaceae	Nemophila parviflora
Nemophila, Sticky	Hydrophyllaceae	Phacelia nemoralis
Nettle, Slim	Urticaceae	Urtica dioica
Nevarretia, Needle-leaf	Polemoniaceae	Nevarretia intertexta
Nightshade, Enchanter's	Onagraceae	Circaea alpina
Onion, Congested Fool's	Liliaceae	Brodiaea congesta
Onion, Thin Leaf	Liliaceae	Allium amplectens
Onion, Wild	Liliaceae	Allium, sp.
Orchid, Calypso	Orchidaceae	Calypso bulbosa
Orchid, Elegant	Orchidaceae	Habernaria elegans
Orchid, Phantom	Orchidaceae	Eburophyton austiniae
Owl-Clover, Hairy	Scrophulariaceae	Orthocarpus hispidus
Paintbrush, Golden	Scrophulariaceae	Castilleja levisecta
Paintbrush, Harsh	Scrophulariaceae	Castilleja hispida
Parsley, Bradshaw's Desert	Apiaceae	Lomatium bradshawii
Parsley, Hedge	Apiaceae	Caucalis microcarpa
Parsley, Pacific Water-	Apiaceae	Oenanthe sarmentosa

Table E.3 (cont.), page 5 of 8.

Local Name	Family	Latin Name
HERB (CONT.)		
Parsnip, Cow	Apiaceae	Heracleum lanatum
Pathfinder	Asteraceae	Adenocaulon bicolor
Pea, Mountain Golden	Fabaceae	Thermopsis montana
Pearly-Everlasting	Asteraceae	Anaphalis margaritacea
Peavine, Leafy	Fabaceae	Lathyrus polyphyllus
Peavine, Pacific	Fabaceae	Lathyrus vestitus
Peavine, Purple	Fabaceae	Lathyrus nevadensis
Peavine, Thin-leaved	Fabaceae	Lathyrus holochlorus
Pennywort, Whorled Marsh	Apiaceae	Hydrocotyle verticillata
Phacelia, Varileaf	Hydrophyllaceae	Phacelia heterophylla
Piggy-A-Back Plant	Saxifragaceae	Tolmiea menziesii
Pineapple Weed	Asteraceae	Matricaria discoidea
Plantain, Rattlesnake-	Orchidaceae	Goodyera oblongifolia
Plectritis, Rosy	Valerianaceae	Plectritis congesta
Popcorn Flower, Wild	Boraginaceae	Plagiobothrys hirtus
Poppy, California	Papaveraceae	Eschscholzia californica
Prince's Pine	Ericaceae	Chimaphila menziesii
Pyrola, Leafless	Ericaceae	Pyrola aphylla
Pyrola, Whitevein	Ericaceae	Pyrola picta
Queen-Of-The-Forest	Rosaceae	Filipendula occidentalis
Rose, Baldhip	Rosaceae	Rosa gymnocarpa
Rose, Nootka	Rosaceae	Rosa nutkana
Rose, Peafruit	Rosaceae	Rosa pisocarpa
Rush, Dutch	Equisetaceae	Equisetum hyemale
Sandwort, Bigleaf	Caryophyllaceae	Arenaria macrophylla
Sanicle, Pacific	Apiaceae	Sanicula crassicaulis
Sanicle, Purple	Apiaceae	Sanicula bipinnatifida
Sanicle, Sierra	Apiaceae	Sanicula graveolens
Saxifrage, Oregon	Saxifragaceae	Saxifraga oregana
Saxifrage, Swamp	Saxifragaceae	Saxifraga integrifolia
Self-Heal, Common	Lamiaceae	Prunella vulgaris
Shooting Star, Henderson's	Primulaceae	Dodecatheon hendersonii
Silene, Hooker's	Caryophyllaceae	Silene hookeri
Snow Queen, Round-Leaved	Scrophulariaceae	Synthyris reniformis
Solomon's Seal, False	Liliaceae	Smilacina stellata
Solomon's Seal, Western False	Liliaceae	Smilacina racemosa
Speedwell, Purslane	Scrophulariaceae	Veronica peregrina
Starflower, Western	Primulaceae	Trientalis latifolia
Starwort, Crisped	Caryophyllaceae	Stellaria crispa
Starwort, Longstalk	Caryophyllaceae	Stellaria longipes
Starwort, Northern	Caryophyllaceae	Stellaria calycantha
Strawberry, Virginia	Rosaceae	Fragaria virginiana
Strawberry, Wild	Rosaceae	Fragaria vesca
Sunflower, Wooly	Asteraceae	Eriophyllum lanatum
Tarweed, Gray	Asteraceae	Madia exigua
Tarweed, Showy	Asteraceae	Madia elegans
Tarweed, Slender	Asteraceae	Madia gracilis
Tarweed, Woodland	Asteraceae	Madia madioides
Thistle, Edible	Asteraceae	Cirsium hallii

Table E.3 (cont.), page 6 of 8.

Local Name	Family	Latin Name
HERB (CONT.)		
Thistle, Mountain	Asteraceae	Cirsium callilepis
Toadflax, Bastard	Santalaceae	Comandra umbellata
Toothwort, Slender	Brassicaceae	Cardamine pulcherrima
Trefoil, Birdsfoot	Fabaceae	Lotus corniculatus
Trillium, Giant	Liliaceae	Trillium chloropetalum
Trillium, Western White	Liliaceae	Trillium ovatum
Twayblades, Heart-leaf	Orchidaceae	Listera cordata
Twinflower	Caprifoliaceae	Linnaea borealis var. longifolia
Twisted Stalk	Liliaceae	Streptopus amplexifolius
Vanillaleaf	Berberidaceae	Achlys triphylla
Veronica, American	Scrophulariaceae	Veronica Americana
Vetch, American	Fabaceae	Vicia americana
Vetch, Applegate’s Milk	Fabaceae	Astragalus applegatei
Violet, Baker’s	Violaceae	Viola nuttallii
Violet, Pioneer	Violaceae	Viola glabella
Violet, Redwood	Violaceae	Viola sempervirens
Watercress	Brassicaceae	Rorippa nasturtium-aquaticum
Waterleaf, Fendler’s	Hydrophyllaceae	Hydrophyllum fendleri
Waterleaf, Slender-Stalk	Hydrophyllaceae	Hydrophyllum tenuipes
Waterleaf, Western	Hydrophyllaceae	Hydrophyllum occidentale
Whitlow-grass, Spring	Brassicaceae	Draba verna
Willow-Herb, Autumn	Onagraceae	Epilobium paniculatum
Willow-Herb, Common	Onagraceae	Epilobium glandulosum
Willow-Herb, Small-flowered	Onagraceae	Epilobium minutum
Willow-Herb, Smooth	Onagraceae	Epilobium glabberimum
Willow-Herb, Watson’s	Onagraceae	Epilobium watsonii
Wintercress, American	Brassicaceae	Barbarea orthoceras
Wooly-Heads, Tall	Asteraceae	Psilocarphus elatior
Yarrow	Asteraceae	Achillea millefolium
Yerba Buena	Lamiaceae	Satureja douglasii
NUMBER: 226		
RUSH		
Rush, Daggerleaf	Juncaceae	Juncus ensifolius
Rush, Slender	Juncaceae	Juncus tenuis
Rush, Small-flowered Wood	Juncaceae	Luzula parviflora
Rush, Soft	Juncaceae	Juncus effusus
Rush, Toad	Juncaceae	Juncus bufonius
Rush, Wood	Juncaceae	Luzula campestris
NUMBER: 6		

Table E.3 (cont.), page 7 of 8.

Local Name	Family	Latin Name
SEDGE		
Bullrush, American	Cyperaceae	Scirpus americanus
Bullrush, Smallfruit	Cyperaceae	Scirpus microcarpus
Sedge, Bigleaf	Cyperaceae	Carex amplifolia
Sedge, Creeping	Cyperaceae	Eleocharis palustris
Sedge, Dense	Cyperaceae	Carex densa
Sedge, Dewey's	Cyperaceae	Carex deweyana
Sedge, Foothill	Cyperaceae	Carex tumulicola
Sedge, Fragileleaf	Cyperaceae	Carex fracta
Sedge, Golden	Cyperaceae	Carex aurea
Sedge, Greensheathed	Cyperaceae	Carex feta
Sedge, Henderson's	Cyperaceae	Carex hendersonii
Sedge, Sawbeak	Cyperaceae	Carex stipata
Sedge, Slough	Cyperaceae	Carex obnupta
NUMBER: 13		
SHRUB		
Blackberry, Trailing	Rosaceae	Rubus ursinus
Blackcap	Rosaceae	Rubus leucodermis
Boxwood, Oregon	Celastraceae	Pachistima myrsinites
Ceanothus, Redstem	Rhamnaceae	Ceanothus sanguineus
Currant, Red-flowering	Grossulariaceae	Ribes sanguineum
Currant, Stink	Grossulariaceae	Ribes bracteosum
Dogwood, Red Osier	Cornaceae	Cornus stolonifera
Elderberry, Blue	Caprifoliaceae	Sambucus cerulea
Elderberry, Red	Caprifoliaceae	Sambucus racemosa
Filbert	Betaluceae	Corylus cornuta
Gooseberry, Straggly	Grossulariaceae	Ribes divarcatum
Huckleberry, Red	Ericaceae	Vaccinium parvifolium
Maple, Vine[y]	Aceraceae	Acer circinatum
Mock Orange	Hydrangeaceae	Philadelphus lewisii
Ninebark, Pacific	Rosaceae	Physocarpus capitatus
Oregon Grape, Cascade	Berberidaceae	Berberis nervosa
Oregon Grape, Tallbush	Berberidaceae	Berberis aquifolium
Plum, Indian	Rosaceae	Oemleria cerastiformis
Plum, Wild	Rosaceae	Prunus americana
Poisonoak	Anacardiaceae	Rhus diversiloba
Salal	Ericaceae	Gaultheria shallon
Salmonberry	Rosaceae	Rubus spectabilis
Serviceberry, Western	Rosaceae	Amelanchier alnifolia
Snowberry, Common	Caprifoliaceae	Symphoricarpos albus
Snowberry, Creeping	Caprifoliaceae	Symphoricarpos mollis
Snowbrush	Rhamnaceae	Ceanothus velutinus
Thimbleberry	Rosaceae	Rubus parviflorus
Thornapple	Rosaceae	Crataegus monogynum
Viburnum, Oval-leaved	Caprifoliaceae	Viburnum ellipticum
Whipplevine	Hydrangeaceae	Whipplea modesta
NUMBER: 30		

Table E.3 (cont.), page 8 of 8.

Local Name	Family	Latin Name
TREE		
Alder, Red	Betaluceae	Alnus rubra
Ash, Oregon	Oleaceae	Fraxinus latifolia
Cedar, Incense	Cupressaceae	Calocedrus decurrens
Cherry, Bitter	Rosaceae	Prunus emarginata
Cherry, Choke	Rosaceae	Prunus virginiana
Chittum	Rhamnaceae	Rhamnus purshiana
Cottonwood, Black	Salicaceae	Populus trichocarpa
Dogwood, Pacific	Cornaceae	Cornus nuttallii
Douglas-Fir	Pinaceae	Pseudotsuga menziesii
Fir, Grand	Pinaceae	Abies grandis
Hawthorne, Black	Rosaceae	Crataegus douglasii
Hemlock, Western	Pinaceae	Tsuga heterophylla
Madrone, Pacific	Ericaceae	Arbutus menzesii
Maple, Bigleaf	Aceraceae	Acer macrophyllum
Oak, Oregon White	Fagaceae	Quercus garryana
Redcedar, Western	Cupressaceae	Thuja plicata
Willow Salicaceae	Salix unknown	
Willow, Scouler's	Salicaceae	Salix scouleriana
Yew	Taxaceae	Taxus brevifolia
NUMBER: 19		
VINE		
Honeysuckle, Hairy	Caprifoliaceae	Lonicera hispidula
Honeysuckle, Western	Caprifoliaceae	Lonicera ciliosa
NUMBER: 2		

TOTAL NUMBER: 331

Table E.4 Exotic vascular plants, 1826-1999. Page 1 of 3.

Latin Name	Family	Local Name
GRASS		
Agrostis hendersonii	Poaceae	Henderson's Bentgrass
Agrostis tenuis	Poaceae	Colonial Bentgrass
Aira caryophyllea	Poaceae	Silver Hairgrass
Alopecurus pratensis	Poaceae	Meadow Foxtail
Anthoxanthum odoratum	Poaceae	Sweet Vernalgrass
Arrhenatherum elatius	Poaceae	Oatgrass
Avena fatua	Poaceae	Wild Oats
Brachypodium sylvaticum	Poaceae	False Brome
Briza minor	Poaceae	Quaking-grass
Bromus commutatus	Poaceae	Hairy Brome
Bromus japonicus	Poaceae	Japanese Chess
Bromus mollis	Poaceae	Soft Chess
Bromus rigidus	Poaceae	Rip-gut Brome
Bromus secalinus	Poaceae	Chess Brome
Bromus sterilis	Poaceae	Barren Brome
Bromus tectorum	Poaceae	Cheat Grass
Cynosurus cristatus	Poaceae	Crested Dogtail
Cynosurus echinatus	Poaceae	Hedgehog Dogtail
Dactylis glomerata	Poaceae	Orchard-grass
Fescue bromoides	Poaceae	Barren Fescue
Festuca arundinacea	Poaceae	Tall Fescue
Festuca myuros	Poaceae	Rat-tail Fescue
Festuca pratensis	Poaceae	Meadow Fescue
Festuca rubra	Poaceae	Red Fescue
Holcus lanatus	Poaceae	Common Velvet-grass
Hordeum marinum	Poaceae	Mediterranean Barley
Lolium multiflorum	Poaceae	Prairie Ryegrass
Lolium perenne	Poaceae	Perennial Ryegrass
Phalaris aquatica	Poaceae	Harding Grass
Phleum pratense	Poaceae	Common Timothy
Poa annua	Poaceae	Annual Bluegrass
Poa compressa	Poaceae	Canadian Bluegrass
Poa palustris	Poaceae	Fowl Bluegrass
Poa pratensis	Poaceae	Kentucky Bluegrass
Taeniatherum caput-medusa	Poaceae	Medusahead Wildrye
NUMBER: 35		
HERB		
Daucus carota	Apiaceae	Queen Anne's Lace
Torilis purpurea	Apiaceae	Hedge-Parsley
Anthemis cotula	Asteraceae	Stinking Mayweed
Arctium minus	Asteraceae	Common Burdock
Bellis perennis	Asteraceae	English Daisy
Centaurea cyanus	Asteraceae	Bachelor Button
Centaurea pratensis	Asteraceae	Meadow Knapweed
Chrysanthemum leucanthemum	Asteraceae	Oxeye Daisy
Cirsium arvense	Asteraceae	Canada Thistle
Cirsium vulgare	Asteraceae	Bull Thistle
Crepis capillaris	Asteraceae	Smooth Hawksbeard

Table E.4 (cont.). page 2 of 3.

Latin Name	Family	Local Name
HERB (CONT.)		
Crepis setosa	Asteraceae	Rough Crepis
Hypochaeris radicata	Asteraceae	Spotted Cats-Ear
Lactuca biennis	Asteraceae	Tall Blue Lettuce
Lactuca muralis	Asteraceae	Wall Lettuce
Lapsana communis	Asteraceae	Nipplewort
Matricaria chamomilla	Asteraceae	Wild Chamomile
Senecio jocabaea	Asteraceae	Tansy Ragwort
Senecio sylvaticus	Asteraceae	Woodland Groundsel
Senecio vulgaris	Asteraceae	Common Groundsel
Sonchus Alevaceous	Asteraceae	Common Sowthistle
Sonchus asper	Asteraceae	Prickly Sow-Thistle
Tanacetum vulgare	Asteraceae	Common Tansy
Taraxacum officinale	Asteraceae	Dandelion
Tragopogon dubius	Asteraceae	Yellow Salsify
Tragopogon porrifolius	Asteraceae	Purple Salsify
Myosotis discolor	Boraginaceae	Yellow and Blue Myosotis
Brassica compestris	Brassicaceae	Field Mustard
Conringia orientalis	Brassicaceae	Treacle Hare's Ear
Sisymbrium officinale	Brassicaceae	Hedge Mustard
Callitriche stagnalis	Callitrichaceae	Pond Water-Starwort
Cerastium viscosum	Caryophyllaceae	Sticky Chickweed
Cerastium vulgatum	Caryophyllaceae	Chickweed
Dianthus armeria	Caryophyllaceae	Grass Pink
Stellaria media	Caryophyllaceae	Chickweed
Convolvulus arvensis	Convolvulaceae	Field Bindweed
Convolvulus sepium	Convolvulaceae	Hedge Bindweed
Dipsacus sylvestris	Dipsacaceae	Teasel
Euphorbia peplus	Euphorbiaceae	Beetle Spurge
Lathyrus sphaericus	Fabaceae	Grass Peavine
Trifolium dubium	Fabaceae	Suckling Clover
Trifolium pratense	Fabaceae	Red Clover
Trifolium procumbens	Fabaceae	Hop Clover
Trifolium repens	Fabaceae	White Clover
Trifolium subterraneum	Fabaceae	Subterraneum Clover
Vicia cracca	Fabaceae	Tufted Vetch
Vicia hirsuta	Fabaceae	Hairy Vetch
Vicia sativa	Fabaceae	Common Vetch
Vicia tetrasperma	Fabaceae	Slender Vetch
Centaurium umbellatum	Gentianaceae	Common Centaury
Erodium cicutarium	Geraniaceae	Stork's-Bill
Geranium columbinum	Geraniaceae	Longstalked Geranium
Geranium dissectum	Geraniaceae	Cutleaf Geranium
Geranium molle	Geraniaceae	Dovefoot Geranium
Geranium pusillum	Geraniaceae	Small Flowered Crane's Bill
Geranium robertianum	Geraniaceae	Herb Robert
Hypericum perfoliatum	Hypericaceae	St. John's Wort
Lamium purpureum	Lamiaceae	Purple Deadnettle
Melissa officinalis	Lamiaceae	Lemon Balm
Mentha piperita	Lamiaceae	Peppermint

Table E.4 (cont.), page 3 of 3.

Latin Name	Family	Local Name
HERB (CONT.)		
Allium vineale	Liliaceae	Crow Garlic
Narcissus pseudonarcissus	Liliaceae	Fake Narcissus
Plantago lanceolata	Plantaginaceae	Buckhorn Plantain
Plantago major	Plantaginaceae	Rippleseed Plantain
Polygonum aviculare	Polygonaceae	Prostrate Knotweed
Polygonum hydropiper	Polygonaceae	Smartweed
Polygonum sachalinense	Polygonaceae	Giant Knotweed
Rumex acetosella	Polygonaceae	Sheep Sorrel
Rumex conglomeratus	Polygonaceae	Clustered Dock
Rumex crispus	Polygonaceae	Curly Dock
Rumex obtusifolius	Polygonaceae	Broadleaf Dock
Ranunculus repens	Ranunculaceae	Creeping Buttercup
Rosa eglanteria	Rosaceae	Sweet-Brier
Sanguisorba minor	Rosaceae	Small Burnet
Galium parisiense	Rubiaceae	Wall-Bedstraw
Sherardia arvensis	Rubiaceae	Blue Field Madder
Digitalis purpurea	Scrophulariaceae	Foxglove
Parentucellia viscosa	Scrophulariaceae	Yellow Parentucellia
Verbascum blattaria	Scrophulariaceae	Moth Mullein
Veronica persica	Scrophulariaceae	Persian Veronica
Solanum dulcamara	Solanaceae	Blue Bindweed
Velarian locusta	Valerianaceae	Lamb’s Lettuce
NUMBER: 82		
SHRUB		
Ilex aquifolium	Aquifoliceae	English Holly
Cytisus scoparius	Fabaceae	Scotch Broom
Rubus discolor	Rosaceae	Himalayan Blackberry
Rubus laciniatus	Rosaceae	Evergreen Blackberry
NUMBER: 4		
TREE		
Araucaria excelsa	Araucariaceae	Norfolk Pine
Chamaecyparis lawsoniana	Cupressaceae	Whitecedar, Port Orford
Robinia pseudoacacia	Fabaceae	Black Locust
Castanea dentata	Fagaceae	American Chestnut
Aesculus hippocastanum	Hippocastanaceae	Horse Chestnut
Juglans nigra	Juglandaceae	Black Walnut
Juglans regia	Juglandaceae	Enlish Walnut
Abies pinsapo	Pinaceae	Spanish Fir
Pinus sylvestris	Pinaceae	Scot’s Pine
Crataegus mongyna	Rosaceae	One-Seed Hawthorn
Prunus avium	Rosaceae	Sweet Cherry
Pyrus communis	Rosaceae	Pear
Pyrus malus	Rosaceae	Pioneer Apples
NUMBER: 12		

TOTAL NUMBER: 133

Appendix F.
Bearing Tree Species, Locations, Sizes, and Associations, 1852-1882

This appendix lists all US Public Land Survey (PLS) bearing trees (BTs) recorded in Soap Creek Valley between 1851 and 1883 (see Maps 2, 11, and 21; Freeman 1852; Hyde 1852a; 1852b; Ives 1852; Elder 1853; Hathorn 1854a; 1854b; Mercer 1882). BTs are listed individually by species, size, and section (Table F.1; see Map 2), individually by species, size, and distance from survey point (Table F.2; see Map 21), and summarized by species, size, and average distance from survey points (Table F.3). Information is derived from a computerized database first assembled in 1990 (Zybach et al., 1990) for OSU Research Forests (Trosper & Zybach 1996). The original database contains a significant amount of data not included in the following tables, including the location, distance, and bearing of individual trees in relation to survey corners and subdivisions, and specific page numbers of transcribed original survey notes in possession of the Benton County Surveyor's Office.

Table F.1 lists every Soap Creek Valley BT recorded before 1883. Trees are grouped according to the legal description of the study area section in which they are found, and arranged by species and diameter (in inches). The name of the original surveyor, the date the BT was originally measured and recorded, and the number of survey chains (a chain equals 66 feet) each tree is located from a specific survey point, are also listed. Each section is summarized by the total number of BTs within the study area, their average diameter, and their average distance from survey points. These data are plotted on Map 21, but the scale is too small to be clearly visible on a map of this size. Larger plottings of the data allow for easy identification of individual tree locations, species, and diameter class.

Table F.2 lists the same BTs listed in Table F.1, but arrangement is by species instead of location (section). Species are arranged by diameter and distance from survey point. Understory trees and associated wild plant species are also listed for each tree location whenever that information was provided by the original surveyor. Each species' group is summarized by total number of trees, average diameter, and average distance from survey points. (This table seems to indicate a number of significant correlations between BT species, tree sizes, stand density, and associated plant species.)

Table F.3 is a summary of BT data contained in Tables F.1 and F.2. It shows the total number of Soap Creek Valley BTs by species, their average diameter (in inches), and their average distance from survey points (in feet). See Appendix G; Tables 15, 19, 20, and 21.

Table F.1 Species, diameters, locations, and recording dates. See Maps 2, 11, and 21. Page 1 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 10 S., Rng. 4 W., Sec. 7				
ASH	12	Hathorn	18540712	5.16
OAK	10	Freeman	18520710	0.74
OAK	14	Freeman	18520123	5.12
OAK	24	Hathorn	18540711	1.25
OAK	30	Hathorn	18540711	0.28
Number: 5	**Ave: 18**			**Ave: 2.51**
Tsp. 10 S., Rng. 4 W., Sec. 18				
OAK	15	Freeman	18520710	1.02
OAK	20	Freeman	18520710	0.98
OAK	24	Hathorn	18540711	9.97
Number: 3	**Ave: 20**			**Ave: 3.99**
Tsp. 10 S., Rng. 4 W., Sec. 19				
ASH	20	Hathorn	18540710	5.20
OAK	10	Freeman	18520710	1.02
OAK	13	UK	18590823	0.31
OAK	15	UK	18590823	0.30
OAK	15	UK	18590823	0.53
OAK	15	Hathorn	18540711	8.20
OAK	20	UK	18590823	0.52
Number: 7	**Ave: 15**			**Ave: 2.30**
Tsp. 10 S., Rng. 4 W., Sec. 30				
OAK	20	Freeman	18520123	2.20
Number: 1	**Ave: 20**			**Ave: 2.20**
Tsp. 10 S., Rng. 5 W., Sec. 10				
OAK	30	Hathorn	18540817	3.91
Number: 1	**Ave: 30**			**Ave: 3.91**
Tsp. 10 S., Rng. 5 W., Sec. 11				
ASH	10	Hathorn	18540819	41.26
OAK	12	Elder	18530303	0.52
OAK	12	Hathorn	18540821	1.88
OAK	15	Hathorn	18540821	4.56
OAK	15	Hathorn	18540819	13.45
OAK	20	Hathorn	18540819	10.36
OAK	20	Hathorn	18540821	13.00
OAK	30	Elder	18530303	2.39
OAK	40	Elder	18530303	1.73
OAK	40	Elder	18530303	2.15
Number: 10	**Ave: 21**			**Ave: 9.13**

Table F.1 (cont.), page 2 of 8.

BT Species	DIA	Surveyor	Date	Chains
	Tsp. 10 S., Rng. 5 W., Sec. 12			
ASH	8	Elder	18530229	0.76
ASH	10	Hathorn	18540712	2.29
ASH	14	Elder	18530229	5.20
ASH	15	Hathorn	18540712	3.54
OAK	15	Hathorn	18540821	13.80
OAK	18	Elder	18530229	3.58
OAK	18	Freeman	18520123	7.73
Number: 7	**Ave: 14**			**Ave: 5.27**
	Tsp. 10 S., Rng. 5 W., Sec. 13			
ASH	6	Hathorn	18540712	2.85
ASH	12	Hathorn	18540819	36.61
ASH	14	Elder	18530229	2.30
ASH	20	Elder	18530229	5.24
OAK	20	Hathorn	18540712	2.33
Number: 5	**Ave: 14**			**Ave: 9.87**
	Tsp. 10 S., Rng. 5 W., Sec. 14			
ASH	10	Elder	18530229	1.48
ASH	10	Elder	18530229	4.50
OAK	10	Elder	18530302	0.38
OAK	12	Hathorn	18540819	3.87
OAK	15	Hathorn	18540819	1.72
OAK	15	Hathorn	18540819	3.89
OAK	15	Hathorn	18540711	4.95
OAK	16	Elder	18530302	0.60
OAK	18	Elder	18530303	2.14
OAK	20	Elder	18530303	0.88
OAK	20	Hathorn	18540819	3.63
OAK	20	Elder	18530229	4.22
OAK	24	Hathorn	18540711	1.09
OAK	36	Hathorn	18540711	3.13
OAK	40	Hathorn	18540819	60.20
Number: 15	**Ave: 19**			**Ave: 6.45**
	Tsp. 10 S., Rng. 5 W., Sec. 15			
OAK	13	Elder	18530305	1.23
OAK	14	Elder	18530305	0.00
OAK	18	Elder	18530305	1.49
OAK	30	Elder	18530303	0.38
OAK	20	Elder	18530302	1.08
Number: 5	**Ave: 19**			**Ave: 0.84**

Table F.1 (cont.), page 3 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 10 S., Rng. 5 W., Sec. 22				
CHERRY	8	Elder	18530305	0.63
DOUGLAS-FIR	24	Hathorn	18540817	0.55
OAK	11	Elder	18530305	1.40
OAK	11	Elder	18530305	3.28
OAK	12	Elder	18530302	0.77
OAK	12	Elder	18530305	2.06
OAK	12	Hathorn	18540817	2.64
OAK	20	Hathorn	18540817	0.30
OAK	20	Elder	18530305	0.57
OAK	30	Elder	18530302	1.02
WILLOW	10	Mercer	18820509	0.50
Number: 11	**Ave: 15**			**Ave: 1.25**
Tsp. 10 S., Rng. 5 W., Sec. 23				
ASH	14	Elder	18530228	6.37
MAPLE	24	Elder	18530302	15.07
OAK	10	Elder	18530302	1.08
OAK	10	Elder	18530302	3.22
OAK	12	Hathorn	18540819	0.25
OAK	12	Hathorn	18540819	0.32
OAK	12	Elder	18530302	0.34
OAK	12	Hathorn	18540817	3.21
OAK	12	Hathorn	18540817	3.25
OAK	15	Hathorn	18540817	6.03
OAK	18	Hathorn	18540817	0.96
OAK	18	Hathorn	18540817	1.35
OAK	18	Hathorn	18540713	2.14
OAK	18	Hathorn	18540713	42.56
OAK	20	Elder	18530302	0.31
OAK	20	Hathorn	18540710	1.90
OAK	20	Hathorn	18540711	3.18
OAK	24	Hathorn	18540710	0.68
OAK	24	Hathorn	18540817	2.58
OAK	30	Hathorn	18540713	3.67
OAK	30	Hathorn	18540710	7.83
OAK	30	Hathorn	18540710	8.80
OAK	36	Hathorn	18540817	23.65
Number: 23	**Ave: 19**			**Ave: 6.03**

Table F.1 (cont.), page 4 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 10 S., Rng. 5 W., Sec. 24				
ASH	11	Freeman	18520123	4.86
ASH	12	Hathorn	18540710	9.83
OAK	18	Hathorn	18540710	1.70
ASH	18	Elder	18530229	2.12
OAK	18	Freeman	18520123	2.13
OAK	20	Hathorn	18540710	5.65
OAK	24	Hathorn	18540710	1.03
OAK	24	Elder	18530228	1.19
OAK	30	Hathorn	18540710	11.66
OAK	40	Freeman	18520123	10.50
OAK	40	Hathorn	18540710	11.94
Number: 11	**Ave: 23**			**Ave: 5.69**
Tsp. 10 S., Rng. 5 W., Sec. 25				
MAPLE	12	Hathorn	18540818	1.81
OAK	8	Hathorn	18540713	1.07
OAK	12	Elder	18530228	0.21
OAK	12	Hathorn	18540818	3.14
OAK	15	Hathorn	18540818	0.92
OAK	15	Hathorn	18540713	1.63
OAK	18	Hathorn	18540818	0.56
OAK	18	Elder	18530228	0.88
OAK	30	Elder	18530228	2.11
OAK	36	Elder	18530228	7.83
Number: 10	**Ave: 18**			**Ave: 2.02**
Tsp. 10 S., Rng. 5 W., Sec. 26				
ALDER	10	Hathorn	18540818	2.03
OAK	8	Elder	18530302	5.80
OAK	9	Hathorn	18540817	3.38
OAK	12	Hathorn	18540818	2.98
OAK	14	Elder	18530302	1.06
OAK	15	Elder	18530301	2.04
OAK	16	Elder	18530228	0.98
OAK	18	Hathorn	18540818	3.69
OAK	20	Hathorn	18540818	0.64
OAK	20	Hathorn	18540817	3.37
OAK	22	Elder	18530301	1.17
OAK	24	Hathorn	18540818	1.08
OAK	24	Elder	18530228	1.43
OAK	24	Hathorn	18540818	2.40
OAK	30	Hathorn	18540817	2.77
OAK	36	Hathorn	18540817	3.95
OAK	36	Elder	18530302	4.36
Number: 18	**Ave: 20**			**Ave: 2.56**

Table F.1 (cont.), page 5 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 10 S., Rng. 5 W., Sec. 27				
CHERRY	12	Elder	18530305	0.80
DOUGLAS-FIR	48	Hathorn	18540817	24.54
MAPLE	6	Mercer	18820509	0.18
MAPLE	20	Hathorn	18540817	4.18
OAK	10	Hathorn	18540817	3.37
OAK	10	Elder	18530302	4.50
OAK	12	Hathorn	18540817	2.42
OAK	12	Hathorn	18540817	3.88
OAK	12	Hathorn	18540815	4.42
OAK	12	Elder	18530301	5.86
OAK	13	Elder	18530305	1.36
OAK	14	Elder	18530302	8.97
OAK	16	Elder	18530305	7.81
OAK	18	Hathorn	18540817	2.61
OAK	18	Hathorn	18540817	3.83
OAK	20	Hathorn	18540817	1.60
OAK	20	Hathorn	18540817	1.92
OAK	20	Hathorn	18540817	2.82
OAK	20	Hathorn	18540815	3.06
OAK	20	Hathorn	18540815	3.55
OAK	24	Elder	18530305	2.01
OAK	24	Hathorn	18540815	3.04
OAK	30	Elder	18530305	0.77
Number: 23	**Ave: 18**			**Ave: 4.24**
Tsp. 10 S., Rng. 5 W., Sec. 28				
CHERRY	8	Mercer	18820509	0.33
DOGWOOD	10	Mercer	18820509	0.30
DOUGLAS-FIR	8	Mercer	18820509	0.10
DOUGLAS-FIR	10	Mercer	18820509	0.06
DOUGLAS-FIR	13	Elder	18530305	0.27
MAPLE	6	Mercer	18820509	0.20
OAK	8	Mercer	18820510	2.30
OAK	12	Elder	18530305	6.02
OAK	11	Mercer	18820510	0.30
OAK	11	Elder	18530305	0.30
Number: 10	**Ave: 10**			**Ave: 1.02**
Tsp. 10 S., Rng. 5 W., Sec. 29				
DOUGLAS-FIR	8	Mercer	18820000	0.22
DOUGLAS-FIR	30	Mercer	18820511	0.20
MAPLE	6	Mercer	18820511	0.18
OAK	24	Mercer	18820509	0.95
Number: 4	**Ave: 17**			**Ave: 0.39**
Tsp. 10 S., Rng. 5 W., Sec. 31				
DOUGLAS-FIR	40	Freeman	18520300	0.35
Number: 1	**Ave: 40**			**Ave: 0.35**

Table F.1 (cont.), page 6 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 10 S., Rng. 5 W., Sec. 32				
CHERRY	8	Mercer	18820509	0.20
DOUGLAS-FIR	10	Mercer	18820510	0.27
DOUGLAS-FIR	10	Mercer	18820000	0.08
DOUGLAS-FIR	24	Mercer	18820511	0.30
DOUGLAS-FIR	50	Mercer	18820000	0.40
MAPLE	8	Freeman	18520300	0.00
MAPLE	8	Mercer	18820000	0.20
MAPLE	10	Mercer	18820000	0.55
Number: 9	**Ave: 20**			**Ave: 0.24**
Tsp. 10 S., Rng. 5 W., Sec. 33				
DOGWOOD	8	Mercer	18820510	0.30
DOUGLAS-FIR	8	Mercer	18820510	0.10
DOUGLAS-FIR	10	Mercer	18820509	0.35
DOUGLAS-FIR	48	Mercer	18820510	0.20
OAK	8	Freeman	18520300	2.70
OAK	10	Mercer	18820510	2.96
OAK	14	Elder	18530305	0.65
OAK	14	Elder	18530305	3.78
OAK	15	Elder	18530226	0.66
Number: 8	**Ave: 11**			**Ave: 1.44**
Tsp. 10 S., Rng. 5 W., Sec. 34				
ALDER	12	Hathorn	18540816	1.33
OAK	12	Hathorn	18540815	0.43
OAK	12	Elder	18530305	0.78
OAK	12	Hathorn	18540815	2.40
OAK	14	Freeman	18520300	0.65
OAK	15	Hathorn	18540815	23.30
OAK	16	Elder	18530226	1.20
OAK	16	Elder	18530226	1.42
OAK	16	Elder	18530301	1.54
OAK	18	Elder	18530226	0.57
OAK	18	Elder	18530226	0.58
OAK	20	Elder	18530301	0.38
OAK	20	Hathorn	18540815	2.00
OAK	24	Hathorn	18540815	2.15
OAK	24	Hathorn	18540816	3.62
OAK	26	Elder	18530305	2.89
OAK	30	Elder	18530305	0.87
OAK	30	Hathorn	18540815	1.72
OAK	30	Hathorn	18540815	1.85
OAK	30	Hathorn	18540815	3.55
OAK	30	Hathorn	18540815	4.00
Number: 21	**Ave: 20**			**Ave: 2.73**

Table F.1 (cont.), page 7 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 10 S., Rng. 5 W., Sec. 35				
DOGWOOD	6	Hathorn	18540816	0.12
DOUGLAS-FIR	48	Hathorn	18540816	1.00
OAK	10	Elder	18530228	2.18
OAK	12	Elder	18530226	0.97
OAK	14	Elder	18530301	0.92
OAK	14	Elder	18530228	6.30
OAK	18	Elder	18530226	1.05
OAK	20	Elder	18530226	2.20
OAK	30	Elder	18530301	1.27
OAK	30	Elder	18530301	2.16
Number: 10	**Ave: 20**			**Ave: 1.82**
Tsp. 11 S., Rng. 5 W., Sec. 2				
OAK	10	Freeman	18520300	0.78
Number: 1	**Ave: 10**			**Ave: 0.78**
Tsp. 11 S., Rng. 5 W., Sec. 3				
MAPLE	6	Freeman	18520622	0.50
OAK	12	Freeman	18520300	0.36
OAK	12	Freeman	18520300	2.40
OAK	14	Freeman	18520622	0.12
OAK	14	Freeman	18520621	3.60
OAK	16	Freeman	18520300	0.85
Number: 6	**Ave: 12**			**Ave: 1.30**
Tsp. 11 S., Rng. 5 W., Sec. 4				
ALDER	10	Freeman	18520300	1.90
DOUGLAS-FIR	60	Freeman	18520622	0.55
MAPLE	8	Freeman	18520625	0.36
OAK	8	Freeman	18520622	1.10
OAK	8	Freeman	18520300	2.25
OAK	10	Freeman	18520625	0.71
OAK	16	Freeman	18520300	4.40
OAK	16	Freeman	18520625	1.10
Number: 8	**Ave: 17**			**Ave: 1.55**
Tsp. 11 S., Rng. 5 W., Sec. 5				
ALDER	14	Freeman	18520626	0.52
DOUGLAS-FIR	6	Freeman	18520626	0.61
DOUGLAS-FIR	10	Freeman	18520625	0.75
DOUGLAS-FIR	12	Freeman	18520626	0.18
MAPLE	10	Freeman	18520300	0.37
OAK	8	Freeman	18520300	1.70
OAK	14	Freeman	18520625	2.80
OAK	16	Freeman	18520300	3.32
Number: 8	**Ave: 11**			**Ave: 1.28**

Table F.1 (cont.), page 8 of 8.

BT Species	DIA	Surveyor	Date	Chains
Tsp. 11 S., Rng. 5 W., Sec. 6				
DOUGLAS-FIR	6	Freeman	18520626	0.61
DOUGLAS-FIR	12	Freeman	18520300	0.43
DOUGLAS-FIR	40	Freeman	18520300	0.35
DOUGLAS-FIR	60	Freeman	18520300	12.11
MAPLE	8	Freeman	18520300	0.65
MAPLE	10	Freeman	18520300	0.45
MAPLE	12	Freeman	18520626	0.15
OAK	8	Freeman	18520300	1.59
YEW	12	Freeman	18520626	0.45
Number: 9	**Ave: 19**			**Ave: 1.87**
Tsp. 11 S., Rng. 5 W., Sec. 7				
DOGWOOD	6	Freeman	18520626	0.29
DOGWOOD	6	Freeman	18520626	0.36
Number: 2	**Ave: 6**			**Ave: 0.32**
Tsp. 11 S., Rng. 5 W., Sec. 8				
DOGWOOD	8	Freeman	18520626	0.56
DOUGLAS-FIR	14	Freeman	18520626	0.15
MAPLE	12	Freeman	18520625	1.15
OAK	8	Freeman	18520625	0.08
OAK	8	Freeman	18520626	2.09
OAK	16	Freeman	18520625	3.32
Number: 6	**Ave: 11**			**Ave: 1.22**
Tsp. 11 S., Rng. 5 W., Sec. 9				
DOUGLAS-FIR	14	Freeman	18520625	0.12
OAK	16	Freeman	18520625	0.75
OAK	20	Freeman	18520625	7.75
WILLOW	3	Freeman	18520625	0.10
Number: 4	**Ave: 13**			**Ave: 2.18**
Total: 262	**Ave: 17**			**Ave: 3.32**

BT Species	Species (see Appendix E) of individual PLS bearing trees. Total number of BTs are given for each sectional grouping.
DIA	Diameter (presumably at "breast height" above ground surface) of BT in inches. Average BT diameter is given for each group.
Surveyor	Name of PLS surveyor (listed in reference section) to first take and record BT measures.
Date	Date (Year-Month-Day) that BT was first measured and recorded.
Chains	Distance of BT from established survey point. Each chain equals 66 feet. The average distance to each BT is given for each group.
NOTE:	Total number of BTs, average diameters, and average distances from survey points are given at the bottom of the table. These numbers can be compared with individual section totals to provide a relative comparison of species' size, distribution, and stocking density. Also note differences between 1852-54 and 1882 BT locations, diameters, and distances.

Table F.2 Understory plant species' associations and locations. See Maps 2, 11, and 21. Page 1 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
ALDER				
10-05-26	10	2.03		
11-05-04	10	1.90		GRASS
10-05-34	12	1.33		
11-05-05	14	0.52		
Number: 4	**Ave. 12**	**Ave: 1.44**		
ASH				
10-05-13	6	2.85	WILLOW	
10-05-12	8	0.76		CAMAS
10-05-14	10	1.48		CAMAS
10-05-12	10	2.29	WILLOW	
10-05-14	10	4.50		CAMAS
10-05-11	10	41.26		
10-05-24	11	4.86		GRASS
10-04-07	12	5.16	WILLOW	
10-05-24	12	9.83		
10-05-13	12	36.61		
10-05-13	14	2.30		
10-05-12	14	5.20		CAMAS
10-05-23	14	6.37		
10-05-12	15	3.54	WILLOW	
10-05-24	18	2.12		
10-04-19	20	5.20		
10-05-13	20	5.24		
Number: 17	**Ave. 13**	**Ave: 8.21**		
CHERRY				
10-05-32	8	0.20		
10-05-28	8	0.33		GRASS
10-05-22	8	0.63	WILLOW	BRIAR, FERN, HAZEL, VINE MAPLE
10-05-27	12	0.80	WILLOW	BRIAR, FERN, HAZEL, VINE MAPLE
Number: 4	**Ave. 9**	**Ave: 0.49**		
DOGWOOD				
10-05-35	6	0.12		
11-05-07	6	0.29	YEW	FERN, HAZEL, TASSEL, VINE MAPLE
11-05-07	6	0.36		HAZEL, VINE MAPLE
10-05-33	8	0.30		GRASS, HAZEL
11-05-08	8	0.56		HAZEL, VINE MAPLE
10-05-28	10	0.30		GRASS
Number: 6	**Ave. 7**	**Ave: 0.32**		

Table F.2 (cont.), page 2 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
DOUGLAS-FIR				
11-05-05	6	0.61		HAZEL, VINE MAPLE
11-05-06	6	0.61		HAZEL, VINE MAPLE
10-05-28	8	0.10	DOGWOOD	GRASS, HAZEL
10-05-33	8	0.10		GRASS, HAZEL
10-05-29	8	0.22		GRASS, HAZEL
10-05-28	10	0.06		GRASS, HAZEL
10-05-32	10	0.08		HAZEL
10-05-32	10	0.27		HAZEL
10-05-33	10	0.35		GRASS
11-05-05	10	0.75	CHERRY	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-05	12	0.18	WILLOW	FERN, HAZEL, TASSEL, VINE MAPLE
11-05-06	12	0.43	YEW	HAZEL, VINE MAPLE
10-05-28	13	0.27	WILLOW	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-09	14	0.12	CHERRY	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-08	14	0.15	WILLOW	FERN, HAZEL, TASSEL, VINE MAPLE
10-05-22	24	0.55		
10-05-32	24	0.30		HAZEL, VINE MAPLE
10-05-29	30	0.20		GRASS, HAZEL, VINE MAPLE
10-05-31	40	0.35		BRIAR, FERN, HAZEL, VINE MAPLE
11-05-06	40	0.35	YEW	BRIAR, FERN, HAZEL, VINE MAPLE
10-05-27	48	24.54		
10-05-32	48	0.20		HAZEL
10-05-35	48	1.00		
10-05-32	50	0.40		HAZEL
11-05-04	60	0.55		
11-05-06	60	12.11		BRIAR, FERN, HAZEL, VINE MAPLE
Number: 26	**Ave. 24**	**Ave: 1.73**		
OAK				
10-05-27	6	0.18	DOGWOOD	HAZEL
10-05-29	6	0.18		GRASS, HAZEL, VINE MAPLE
10-05-28	6	0.20	DOGWOOD	GRASS, HAZEL
11-05-03	6	0.50		
10-05-32	8	0.00	YEW	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-08	8	0.08	CHERRY	BRIAR, FERN, HAZEL, VINE MAPLE
10-05-32	8	0.20		HAZEL
11-05-04	8	0.36	CHERRY	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-06	8	0.65	YEW	BRIAR, VINE MAPLE
10-05-25	8	1.07		
11-05-04	8	1.10		
11-05-06	8	1.59	YEW	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-05	8	1.70	YEW	BRIAR, FERN, HAZEL, VINE MAPLE
11-05-08	8	2.09		HAZEL, VINE MAPLE
11-05-04	8	2.25		GRASS
10-05-28	8	2.30	PINE?	GRASS, HAZEL
10-05-33	8	2.70		GRASS
10-05-26	8	5.80		
10-05-26	9	3.38		
11-05-05	10	0.37	YEW	BRIAR, FERN, HAZEL, VINE MAPLE

Table F.2 (cont.), page 3 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
OAK (cont.)				
10-05-14	10	0.38		
11-05-06	10	0.45		BRIAR, FERN, HAZEL, VINE MAPLE
10-05-32	10	0.55		HAZEL
11-05-04	10	0.71		BRIAR, FERN, HAZEL, VINE MAPLE
10-04-07	10	0.74		GRASS
11-05-02	10	0.78		
10-04-19	10	1.02		GRASS
10-05-23	10	1.08		
10-05-35	10	2.18		
10-05-33	10	2.96	PINE?	GRASS, HAZEL
10-05-23	10	3.22		
10-05-27	10	3.37		
10-05-27	10	4.50		
10-05-28	11	0.30	PINE?	GRASS, HAZEL
10-05-28	11	0.30	WILLOW	BRIAR, FERN, HAZEL
10-05-22	11	1.40	WILLOW	FERN, HAZEL
10-05-22	11	3.28	WILLOW	FERN, HAZEL
11-05-06	12	0.15		
10-05-25	12	0.21		
10-05-23	12	0.25		
10-05-23	12	0.32		
10-05-23	12	0.34		
11-05-03	12	0.36		
10-05-34	12	0.43		
10-05-11	12	0.52		BRIAR, HAZEL, NINEBARK
10-05-22	12	0.77		
10-05-34	12	0.78	WILLOW	BRIAR, FERN, HAZEL
10-05-35	12	0.97		BRIAR, FERN, HAZEL
11-05-08	12	1.15	CHERRY	BRIAR, FERN, HAZEL, VINE MAPLE
10-05-25	12	1.81		
10-05-11	12	1.88		
10-05-22	12	2.06		
10-05-34	12	2.40		
11-05-03	12	2.40		GRASS
10-05-27	12	2.42		
10-05-22	12	2.64		
10-05-26	12	2.98		
10-05-25	12	3.14		
10-05-23	12	3.21		
10-05-23	12	3.25		
10-05-14	12	3.87		
10-05-27	12	3.88		
10-05-27	12	4.42		
10-05-27	12	5.86	WILLOW	BRIAR, HAZEL
10-05-28	12	6.02	WILLOW	BRIAR, FERN, HAZEL, VINE MAPLE
10-04-19	13	0.31		
10-05-15	13	1.23		BRIAR, HAZEL, VINE MAPLE
10-05-27	13	1.36	WILLOW	BRIAR, FERN, HAZEL
10-05-15	14	0.00	WILLOW	BRIAR, HAZEL, NINEBARK

Table F.2 (cont.), page 4 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
OAK (cont.)				
11-05-03	14	0.12		
10-05-33	14	0.65	WILLOW	BRIAR, FERN, HAZEL
10-05-34	14	0.65		
10-05-35	14	0.92	WILLOW	BRIAR, HAZEL
10-05-26	14	1.06		
11-05-05	14	2.80		BRIAR, HAZEL, VINE MAPLE
11-05-03	14	3.60		ARROWWOOD, HAZEL
10-05-33	14	3.78	WILLOW	BRIAR, FERN, HAZEL
10-04-07	14	5.12		GRASS
10-05-35	14	6.30		
10-05-27	14	8.97		
10-04-19	15	0.30		
10-04-19	15	0.53		
10-05-33	15	0.66		BRIAR, HAZEL
10-05-25	15	0.92		
10-04-18	15	1.02		GRASS
10-05-25	15	1.63		
10-05-14	15	1.72		
10-05-26	15	2.04	WILLOW	BRIAR, HAZEL
10-05-26	15	2.92		
10-05-14	15	3.89		
10-05-11	15	4.56		
10-05-14	15	4.95		
10-05-23	15	6.03		
10-04-19	15	8.20		
10-05-11	15	13.45		
10-05-12	15	13.80		
10-05-34	15	23.30		
10-05-14	16	0.60		
11-05-09	16	0.75		
11-05-03	16	0.85		
10-05-26	16	0.98		
11-05-04	16	1.10		BRIAR, HAZEL, VINE MAPLE
10-05-34	16	1.20		BRIAR, FERN, HAZEL
10-05-34	16	1.42		BRIAR, HAZEL
10-05-34	16	1.54	WILLOW	BRIAR, HAZEL
11-05-05	16	3.32		
11-05-08	16	3.32		
11-05-04	16	4.40		
10-05-27	16	7.81	WILLOW	BRIAR, FERN, HAZEL, VINE MAPLE
10-05-25	18	0.56		
10-05-34	18	0.57		BRIAR, HAZEL
10-05-34	18	0.58		BRIAR, HAZEL
10-05-25	18	0.88		
10-05-23	18	0.96		
10-05-35	18	1.05		BRIAR, FERN, HAZEL
10-05-23	18	1.35		
10-05-15	18	1.49	WILLOW	FERN, HAZEL
10-05-24	18	1.70		

Table F.2 (cont.), page 5 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
OAK (cont.)				
10-05-24	18	2.13		GRASS
10-05-14	18	2.14	WILLOW	
10-05-23	18	2.14		
10-05-27	18	2.61		
10-05-12	18	3.58	WILLOW	HAZEL
10-05-26	18	3.69		
10-05-27	18	3.83		
10-05-12	18	7.73		GRASS
10-05-23	18	42.56		
10-05-22	20	0.30		
10-05-23	20	0.31		
10-05-34	20	0.38	WILLOW	BRIAR, HAZEL
10-04-19	20	0.52		
10-05-22	20	0.57		BRIAR, HAZEL, VINE MAPLE
10-05-26	20	0.64		
10-05-14	20	0.88	WILLOW	
10-04-18	20	0.98		GRASS
10-05-15	20	1.08		
10-05-27	20	1.60		
10-05-23	20	1.90		
10-05-27	20	1.92		
10-05-34	20	2.00		
10-04-30	20	2.20		GRASS
10-05-35	20	2.20		BRIAR, FERN, HAZEL
10-05-13	20	2.33	WILLOW	
10-05-27	20	2.82		
10-05-27	20	3.06		
10-05-23	20	3.18		
10-05-26	20	3.37		
10-05-27	20	3.55		
10-05-14	20	3.63		
10-05-27	20	4.18		
10-05-14	20	4.22		
10-05-24	20	5.65		
11-05-09	20	7.75		
10-05-11	20	10.36		
10-05-11	20	13.00		
10-05-26	22	1.17		FERN, HAZEL
10-05-23	24	0.68		
10-05-29	24	0.95		GRASS
10-05-24	24	1.03		
10-05-26	24	1.08		
10-05-14	24	1.09		
10-05-24	24	1.19		
10-04-07	24	1.25		
10-05-26	24	1.43		
10-05-27	24	2.01		
10-05-34	24	2.15		
10-05-26	24	2.40		

Table F.2 (cont.), page 6 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
OAK (cont.)				
10-05-23	24	2.58		
10-05-27	24	3.04		
10-05-34	24	3.62		
10-04-18	24	9.97		
10-05-23	24	15.07		
10-05-34	26	2.89	WILLOW	BRIAR, FERN, HAZEL
10-04-07	30	0.28		
10-05-15	30	0.38	WILLOW	
10-05-27	30	0.77		
10-05-34	30	0.87		
10-05-22	30	1.02		
10-05-35	30	1.27		FERN, HAZEL
10-05-34	30	1.72		
10-05-34	30	1.85		
10-05-25	30	2.11		
10-05-35	30	2.16	WILLOW	BRIAR, HAZEL
10-05-11	30	2.39	WILLOW	
10-05-26	30	2.77		
10-05-34	30	3.55		
10-05-23	30	3.67		
10-05-10	30	3.91		
10-05-34	30	4.00		
10-05-23	30	7.83		
10-05-23	30	8.80		
10-05-24	30	11.66		
10-05-14	36	3.13		
10-05-26	36	3.95		
10-05-26	36	4.36		
10-05-25	36	7.83		
10-05-23	36	23.65		
10-05-11	40	1.73	WILLOW	
10-05-11	40	2.15	WILLOW	
10-05-24	40	10.50		GRASS
10-05-24	40	11.94		
10-05-14	40	60.20		
Number: 186	**Ave: 18**	**Ave: 3.49**		

Table F.2 (cont.), page 7 of 7.

Tsp:Rng:Sec	DIA	Chains	Trees	Understory Species
WILLOW				
11-05-09	3	0.10	CHERRY	BRIAR, FERN, HAZEL, VINE MAPLE
10-05-22	10	0.50	DOGWOOD	HAZEL
Number: 2	**Ave: 6**	**Ave: 0.30**		
YEW				
11-05-06	12	0.45	YEW	FERN, HAZEL, TASSEL, VINE MAPLE
Number: 1	**Ave: 12**	**Ave: 0.45**		
Total				
Number: 262	**Ave: 17**	**Ave: 3.32**		

Tsp:Rng:Sec	PLS survey: Township, South of the Willamette Meridian; Range, West of the Willamette Meridian, Section No. See Table F.1; Map 2.
DIA	Diameter (presumably at “breast height” above ground surface) of BT in inches. Average BT diameter is given for each BT species.
Chains	Distance of BT from established survey point. Each chain equals 66 feet. The average distance to each BT is given for each species.
Trees	Understory tree species noted by surveyors (see Tables E.3 and F.1).
Understory Species	Understory, non-tree plant species noted by surveyors (see Tables E.3 and F.1). Note differences in detail for each surveyor and for 1852-54 and 1882 time periods.

NOTE: Average diameter and average distance from survey points for all Soap Creek Valley BTs are given at the bottom of the table. These numbers provide a relative measure for individual species’ size and spacing density within the study area. Also note apparent correlations between BT diameters and varieties of understory species’ associations.

Table F.3 Diameter range and spacial distributions of species. See Map 21.

Species	Total	Range	3-14	15-29	30-60	Ave.	Spacing
Alder	4	10-14	4	0	0	12	95
Ash	17	6-20	13	4	0	13	542
Cherry	4	8-12	4	0	0	9	33
Douglas-fir	26	6-60	15	2	9	24	114
Maple	16	6-24	14	2	0	10	107
Oak	186	8-40	66	91	29	18	230
Willow	2	3-10	2	0	0	6	20
Yew	1	12	1	0	0	0	30
Grand Fir (1)	-	-	-	-	-	-	-
Hemlock (2)	-	-	-	-	-	-	-
Redcedar (3)	-	-	-	-	-	-	-
TOTALS	262	3-60	119	99	29	17	219

Species	Species of BT (see Table E.3)
Total	Total number of BTs in Soap Creek Valley of this species.
Range	Smallest to largest BT diameters (in inches) by species.
3-14	Number of original BT diameters measured 3-14 inches, by species. (Note the locations and relative large number of small diameter Douglas-fir measured in 1882; see Table F.1)
15-29	Number of original BT diameters measured 15-29 inches, by species
30-60	Number of original BT diameters measured 30-60 inches, by species
Ave.	Average diameter of all BTs (in inches), by species
Spacing	Average distance to each BT from survey point (in feet), by species. (See NOTE, below.)

NOTE: A section (one-square mile) contains 640 acres. A square acre is 43,560 square feet, or slightly more than 208 feet per side. Therefore, trees spaced an average of 10 feet apart would total about 440 trees per acre; an average of 12 feet would total about 300 trees per acre; 20 feet = 100 trees/acre; 50 feet = 16 trees/acre; 100 feet = 4 trees/acre, & etc. Average distance is a function of species (see Table F.2), sample size (e.g., only 2 willow BTs compared to 186 oak BTs), and BT diameter (smaller trees are generally closer together—and younger—than larger trees: see Tables 20, 21, and F.2). The apparent wide spacing between ash trees is caused, instead, by relatively large expanses of tree-less, floodplain prairies separating the stands of ash (see Map 21 and table 20) from oak and fir wooded hillsides.

(1) Grand fir is common in Soap Creek Valley, but is not noted by PLS surveyors between 1851 and 1883. One possibility is that grand fir trees were mistaken as Douglas-fir or pine (see Appendix G; Tables 14, 15, 21, E.3, and F.2) by early surveyors.
(2) Western hemlock is uncommon in Soap Creek Valley, but at least one 10” diameter hemlock BT was established within the study area by 1915 (see Maps 2 and 12: NE 1/4 of NE 1/4 of Sec. 7, Tsp. 11 S., Rng. 5 W.). It is not known who established this tree, or why the original dogwood BTs (see Table F.1) were not used.
(3) Redcedar are commonly found in only one stand in Soap Creek Valley, the SE 1/4 of the NW 1/4 of Sec. 6, Tsp 11 S., Rng. 5 W (see Table 21; Appendix G). No redcedar BTs have been noted in the study area.

Appendix G
Merchantable Conifer Species, Locations, and Volumes, 1915

This appendix is a tabular summary of commercial timber volumes on private timberlands in Soap Creek Valley. The volumes were derived through a timber cruise performed by J. H. Bagley in 1915 (Bagley 1915), under contract to Benton County, Oregon (Benton County Board of Commissioners 1914). Map 12 and Table 14 in Chapter III are examples of Bagley's work on Tsp. 11 S., Rng 5 W., Sec. 5 (see Map 2). Table G.1 is a summary of Bagley's findings in Soap Creek Valley. It is derived from a computerized database assembled in 1993 (Trosper & Zybach 1996) for OSU Research Forests. Tables 15, 19, and 21 were derived partly from Table G.1. This table is arranged and summarized by section, with conifer timber volumes listed by 40-acre subdivision, by species, size, and age-class.

Table 14 uses a standard method of subdividing a section (a square mile equaling 640 acres on a perfectly flat surface) into 16 approximately-equal squares of 40-acres each (due to curvature of the earth, and other factors, a section is rarely an exact square mile, and resulting subdivisions are usually slightly more or less than 40-acres). This method first divides a section into 4 square "quarter secs"; 1/2-mile squares of about 160-acres each. Each quarter sec is referenced as a quadrant on a map: NE, NW, SE, and SW quarters. Each quarter is then subdivided into four 1/4 mile squares of 40 acres each (see Map 12). The 160-acre NE quarter of a section, therefore, is divided into four "forties": the NE of the NE, the NW of the NE, the SE of the NE, and the SW of the NE. The NW, SE, and SW quadrants of a section are similarly divided and referenced (see Table 14). Table G.1 uses the same method as Bagley, but numbers have been substituted for each 40-acre subdivision. The pattern can most easily be seen by comparing Table 14 with the Tsp. 11 S., Rng. 5 W., Sec 5 listing on Table G.1: Numbers 01-04 designate the four "40s" in the NE quarter sec; 05-08 equal the NW quadrant; 09-12 equal the SW quarter, and 13-16 equal the SE.

Table G.1 lists cruised volumes for "Yellow Fir" (YF), also called old-growth Douglas-fir; for "Red Fir" (RF), large second-growth Douglas-fir; for "White Fir" (WF), old-growth and large second-growth grand fir; and for "Piling," small diameter mixed conifers, mostly Douglas-fir. These four products comprised over 95% of the total softwood volume cruised by Bagley in Soap Creek Valley—with a little redcedar is Tsp. 11 S., Rng. 5 W., Sec. 6, and perhaps some scattered hemlock mixed with the grand fir or piling figures. Each product is listed by volume (MBF, or "thousand board feet," Scribner Scale; see Chapter III) and size. For YF, RF, and WF, size is given as a ratio. The first number is average tree diameter, in inches, about 4 1/2 feet above ground level. The second number is the average number of logs (probably 16-foot lengths) Bagley estimated each tree contained in each forty. For example, from Table G.1, "40" number 04 in the NE quarter of Sec. 22, Tsp. 10 S., Rng. 5 W., contains 300,000 board feet of old-growth Douglas-fir, with an average diameter of 42 inches per tree, and an average of 9 sound logs (144 feet) in the main stem. In the same 40, there are 425,000 board feet of large second-growth Douglas-fir, with an average diameter of 24 inches per tree, and 6 logs (96 feet) of sound timber per tree, and 275,000 feet of grand fir, with an average diameter of 30 inches (might be old-growth) and an average length of greater than 7 logs per tree. Piling size is in feet instead of logs. For the same 40, there were 120,000 board feet of piling, with an average diameter of 14 inches per tree, and an average of 65 sound feet per tree. NOTE: The use of standard Douglas-fir timber cruising tables and 1930s aerial photographs, in combination with this timber cruise, makes it possible to obtain fairly exacting stem counts and stand locations for these lands, many of which were clearcut in the early 1940s (Sauerwein 1948).

Although Bagley's figures are suspect for a number of reasons (note the uniformity and limited number of tree diameters, for example), they provide a sound basis for interpreting earlier land surveys, contemporaneous photographs (Cook 1995), and subsequent aerial photographs and timber cruises Sauerwein 1948; Rowley 1996). The total volume figures—34,185,000 feet of old-growth Douglas-fir, 69,950,000 board feet of large second-growth Douglas-fir, 7,520,000 board feet of grand fir, and 11,534 board feet of piling—are reasonably accurate and provide an excellent idea as to major tree species' age, size, and location in Soap Creek Valley in the early 1900s.

Table G.1 Timber species, products, locations, and volumes, 1915 (Bagley 1915; see Maps 2, 12, 20, 22, and 23; Tables 14, 15, 18, 19, 20, and 21). Page 1 of 5.

	YF		RF		WF		Piling	
"40"	MBF	Size	MBF	Size	MBF	Size	MBF	Size
	Tsp. 10 S., Rng. 5 W., Sec. 15							
09	0	0	320	22:5	0	0	60	14:50
10	0	0	185	22:5	0	0	135	14:65
11	0	0	290	22:5	0	0	112	14:50
12	0	0	280	22:5	0	0	90	14:50
13	0	0	125	22:5	0	0	132	14:65
14	0	0	430	22:5	0	0	90	14:65
15	0	0	425	22:5	0	0	136	14:65
16	0	0	150	22:5	0	0	140	14:65
Total:	**0**		**2, 2050**				**895**	
	Tsp. 10 S., Rng. 5 W., Sec. 22							
01	0	0	225	22:5	0	0	80	14:65
02	0	0	175	22:5	0	0	64	14:65
03	0	0	450	22:6	0	0	150	14:65
04	300	42:9	425	24:6	275	30:7	120	14:65
05	0	0	675	24:6	0	0	86	14:65
06	0	0	950	28:6	0	0	128	14:65
07	0	0	240	24:5	0	0	70	14:65
08	0	0	450	24:6	80	24:6	46	14:65
09	175	42:9	460	26:7	60	26:7	48	14:65
10	75	42:9	400	22:5	0	0	115	14:65
11	0	0	150	24:6	0	0	32	14:65
12	0	0	250	24:6	0	0	25	14:65
Total:	**550**		**4,850**		**415**		**964**	
	Tsp 10 S., Rng. 5 W., Sec. 23							
05	0	0	75	22:5	0	0	25	14:65
06	0	0	450	28:6	225	28:6	66	14:65
07	0	0	275	24:6	0	0	45	14:65
Total:	**0**		**800**		**225**		**136**	
	Tsp 10 S., Rng. 5 W., Sec. 28							
05	0	0	360	24:6	0	0	12	14:50
06	0	0	140	24:6	0	0	12	14:50
07	0	0	560	22:5	0	0	73	14:50
08	0	0	475	24:5	0	0	39	14:50
09	350	40:8	275	22:5	0	0	56	14:50
10	0	0	475	22:5	0	0	70	14:50
11	0	0	85	22:5	0	0	D	
12	0	0	160	22:5	0	0	12	14:50
Total:	**350**		**2,530**		**0**		**274**	
	Tsp 10 S., Rng. 5 W., Sec. 29							
15	80	40:8	325	20:5	0	0	127	14:50
16	0	0	300	22:5	0	0	41	14:50
Total:	**80**		**625**		**0**		**168**	

Table G.1 (cont.), page 2 of 5.

	YF		RF		WF		Piling	
"40"	MBF	Size	MBF	Size	MBF	Size	MBF	Size
	Tsp 10 S., Rng. 5 W., Sec. 32							
01	0	0	260	22:6	0	0	120	14:50
02	125	40:8	310	20:6	0	0	85	14:50
03	150	40:8	300	20:5	40	30:7	60	14:50
04	70	NA	190	20:5	0	0	120	14:50
05	175	40:8	385	28:7	0	0	40	14:50
06	925	36:6	375	34:8	60	34:8	30	14:50
07	0	0	820	26:7	0	0	65	14:50
08	0	0	215	20:5	0	0	50	14:50
09	125	40:8	100	22:6	0	0	60	14:65
10	350	40:8	190	24:6	60	24:6	35	14:65
11	950	36:8	450	22:6	0	0	30	14:65
12	425	40:8	350	22:6	60	24:6	30	14:65
13	425	38:8	340	20:5	0	0	60	14:50
14	175	40:8	200	24:6	60	24:6	50	14:50
15	150	40:8	210	28:6	0	0	20	14:50
16	275	40:8	475	24:6	60	24:6	25	14:50
Total:	**4,320**		**5,170**		**340**		**880**	
	Tsp 10 S., Rng. 5 W., Sec. 33							
01	130	40:8	210	22:5	0	0	51	14:50
02	0	0	175	20:5	0	0	18	14:50
03	75	40:8	280	20:5	0	0	56	14:50
04	120	40:8	340	22:5	0	0	84	14:50
05	210	40:8	175	24:6	0	0	18	14:50
06	0	0	125	24:6	0	0	11	14:50
07	0	0	195	20:5	0	0	127	14:50
08	150	40:8	455	22:6	0	0	101	14:50
09	0	0	360	22:6	0	0	84	14:50
10	0	0	340	20:5	0	0	105	14:50
11	130	44:9	190	20:5	55	24:6	90	14:50
Total:	**815**		**2,845**		**55**		**745**	
	Tsp 10 S., Rng. 5 W., Sec. 35							
01	0	0	425	20:5	0	0	25	14:50
02	0	0	125	20:5	0	0	22	14:50
03	200	40:8	300	24:6	0	0	50	14:50
04	0	0	480	24:6	0	0	65	14:50
09	0	0	350	22:5	0	0	125	14:50
10	0	0	260	22:5	0	0	70	14:50
11	140	40:8	325	24:6	0	0	140	14:50
12	0	0	375	22:5	0	0	210	14:50
14	0	0	360	24:5	0	0	120	14:50
15	0	0	275	24:5	0	0	20	14:50
Total:	**340**		**3,275**		**0**		**847**	

Table G.1 (cont.), page 3 of 5.

	YF		RF		WF		Piling	
"40"	MBF	Size	MBF	Size	MBF	Size	MBF	Size
	Tsp. 11 S., Rng. 5 W., Sec. 2							
05	225	40:8	450	24:6	0	0	80	14:65
06	0	0	625	24:6	0	0	95	14:50
Total:	**225**		**1,075**		**0**		**175**	
	Tsp. 11 S., Rng. 5 W., Sec. 3							
01	0	0	1,000	24:6	0	0	195	14:50
02	75	40:8	275	22:5	0	0	40	14:50
03	200	40:8	430	26:6	60	30:6	30	14:50
04	0	0	450	24:5	0	0	105	14:50
05	175	44:8	260	24:5	50	30:6	195	14:50
06	0	0	125	24:5	0	0	30	14:50
07	400	44:8	250	24:5	60	30:7	110	14:50
08	0	0	315	22:5	0	0	265	14:50
09	300	42:7	240	24:6	125	26:6	80	14:50
10	425	40:7	325	24:5	75	26:6	45	14:50
11	75	40:7	375	24:5	0	0	60	14:50
12	0	0	85	24:5	0	0	80	14:50
13	0	0	600	28:5	0	0	45	14:50
14	0	0	550	26:5	0	0	50	14:50
Total:	**1,650**		**5,280**		**370**		**1,330**	
	Tsp. 11 S., Rng. 5 W., Sec. 4							
01	0	0	75	26:5	0	0	10	14:50
02	0	0	100	26:5	0	0	15	14:50
03	200	44:8	225	28:6	0	0	50	14:65
04	275	42:9	225	28:6	50	30:7	25	14:65
06	60	44:8	230	26:6	0	0	25	14:65
07	40	40:7	60	28:6	0	0	15	14:65
08	125	40:8	540	24:6	0	0	150	14:65
09	75	40:7	375	28:6	0	0	160	14:65
10	125	40:7	335	26:6	75	28:6	55	14:65
11	0	0	285	28:6	225	30:6	85	14:65
12	175	40:7	925	28:6	0	0	60	14:65
13	0	0	690	28:6	80	30:7	65	14:65
14	0	0	225	24:6	0	0	40	14:65
15	0	0	830	34:6	0	0	110	14:65
16	0	0	515	26:6	0	0	170	14:65
Total:	**1,075**		**5,635**		**430**		**1,035**	

Table G.1 (cont.), page 4 of 5.

"40"	YF MBF	YF Size	RF MBF	RF Size	WF MBF	WF Size	Piling MBF	Piling Size
	Tsp. 11 S., Rng. 5 W., Sec. 5							
01	260	40:8	210	30:7	250	30:7	25	14:65
02	375	40:9	280	26:6	0	0	95	14:65
03	0	0	345	22:6	0	0	80	14:65
04	0	0	60	20:5	0	0	10	14:50
05	185	40:8	260	24:6	0	0	120	14:65
06	575	40:8	150	24:6	180	30:6	130	14:65
07	0	0	660	24:6	0	0	235	14:80
08	350	40:8	665	24:6	0	0	40	14:50
09	1,100	42:9	150	28:7	90	34:7	45	14:65
10	1,170	42:9	325	30:7	65	30:7	40	14:65
11	1,075	40:9	375	26:6	125	26:6	45	14:65
12	1,200	42:9	320	30:7	125	30:7	50	14:65
13	160	42:8	475	26:6	190	28:7	60	14:65
14	325	40:7	290	30:6	0	0	20	14:50
15	0	0	950	30:6	0	0	60	14:50
16	150	42:8	680	28:7	175	28:7	45	14:50
Total:	**6,925**		**6,195**		**1,200**		**1,100**	
	Tsp. 11 S., Rng. 5 W., Sec. 6							
01	560	40:9	600	24:7	80	30:7	120	14:80
02	1,300	40:9	800	28:7	0	0	75	14:80
03	650	42:9	750	22:6	300	30:7	50	14:80
04	225	42:9	875	24:7	0	0	225	14:80
05	260	42:9	1,800	28:7	50	28:7	125	14:80
06	1,300	40:9	1,200	34:8	150	34:7	40	14:80
07	550	40:9	1,300	28:7	225	28:8	50	14:80
08	900	40:9	1,200	30:8	300	30:8	75	14:80
09	1,250	40:9	400	28:8	145	30:7	25	14:65
10	1,725	44:9	560	26:8	360	32:7	10	14:65
11	500	42:9	1,350	30:7	90	28:7	35	14:65
12	350	42:9	1,400	30:7	0	0	70	14:65
13	410	40:9	850	30:7	75	26:7	100	14:80
14	250	40:9	875	30:8	325	30:8	20	14:80
15	950	40:9	700	30:8	240	30:8	50	14:65
16	1,050	40:9	450	38:7	160	26:7	45	14:65
Total:	**12,230**		**15,110**		**2,500**		**1,115**	

Table G.1 (cont.), page 5 of 5.

	YF		RF		WF		Piling	
"40"	MBF	Size	MBF	Size	MBF	Size	MBF	Size
	Tsp. 11 S., Rng. 5 W., Sec. 7							
01	550	40:9	290	24:7	65	30:7	60	14:65
02	825	40:9	650	28:7	160	30:7	95	14:65
05	1,315	42:9	425	28:7	120	28:7	50	14:65
Total:	**2,690**		**1,365**		**345**		**205**	
	Tsp. 11 S., Rng. 5 W., Sec. 8							
01	570	42:6	630	30:7	160	30:7	70	14:65
02	200	40:7	465	28:6	30	28:6	150	14:65
03	0	0	1,300	28:6	75	28:6	175	14:65
04	75	40:8	1,100	34:8	145	30:7	36	14:65
05	750	44:8	160	26:6	125	28:7	36	14:65
06	660	42:8	510	28:7	275	28:7	120	14:65
07	0	0	550	24:5	0	0	75	12:65
08	0	0	325	20:5	0	0	48	12:65
09	0	0	675	26:6	0	0	100	14:50
10	80	40:8	560	22:5	70	30:6	80	14:50
12	75	40:7	310	20:5	0	0	90	14:50
13	175	40:8	1,200	34:8	75	30:7	40	14:65
14	75	40:8	225	34:7	0	0	70	14:65
16	0	0	590	30:6	50	30:6	35	14:50
Total:	**2,660**		**8,600**		**1,005**		**1,125**	
	Tsp. 11 S., Rng. 5 W., Sec. 9							
05	125	40:7	465	28:6	0	0	120	14:65
06	0	0	715	28:6	70	30:6	95	14:65
07	0	0	1,100	30:7	140	30:6	90	14:80
08	0	0	750	20:6	125	30:6	95	14:65
10	150	40:7	990	26:6	75	28:6	85	14:65
11	0	0	375	28:6	225	30:7	55	14:65
Total:	**275**		**4,395**		**635**		**540**	
Total:	**34,185**		**69,950**		**7,520**		**11,535**	

Appendix H
Kalapuyan Oral Traditions, 1913-1933

This appendix includes excerpts from anthropological interviews with two Kalapuyan men, William Hartless (see Fig. 5) and John B. Hudson (Fig. H.1) in the early part of this century (Jacobs 1945). They are appended to this thesis for several reasons: 1) they are believed to be the only verbatim transcript recordings of people who frequented Soap Creek Valley before 1890, 2) they are the only known interviews with people whose (second hand) knowledge of Soap Creek Valley precedes pioneer settlement, 3) they provide good examples of differences between oral histories and oral traditions (see Chapter II), 4) they demonstrate the value of anthropological interviews for obtaining certain kinds of historical information (see Chapter II), and 5) they provide a basis for testing an individual informant's validity and reliability.

Fig. H.1. John B. ("Mose") Hudson, 1909. This photograph was cropped from a larger picture of Mose Hudson's blacksmith shop on the Grand Ronde Reservation in 1909 (Zenk 1990). Hudson's age was given as 35 in 1902 and 37 in 1907, according to tribal census records (Whitlow 1988). He was probably born in the late 1860s, perhaps 1868, on the Grand Ronde reservation.

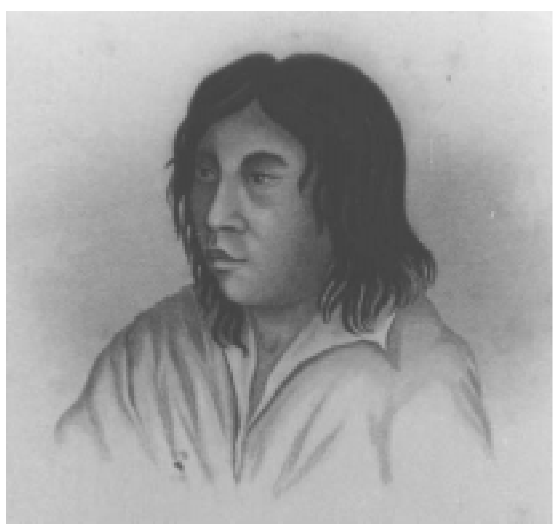
These interviews have been edited from their original print versions (Jacobs 1945) in order to accent the historical data they contain (Zybach 1999). The Hudson interview excerpts, in particular, have been arranged to systematically consider details of prehistoric Kalapuyan life in Soap Creek Valley. Although the Hartless interview excerpt contains only a single myth, it is the same myth related by Hudson, 20 years later. Both men tell the myth in their native language (Chapanafa Kalapuyan and Santiam Kalapuyan languages are very similar), but at different times, with different interviewers, and in different locations. Therefore, the myth can be examined for whatever historical details it might contain, and can also be used to test the capabilitites of Hudson and Hartless to recall and relate detailed information obtained from earlier generations (see Figs. H.2 and H.3). This may be judged an instance in which both informants are reliable, but the historical information they convey is not valid.

Fig. H.2. Joseph Hudson (Yelk-ma), 1851. This sketch of the Santiam Kalapuyan spokesman was made by George Gibbs during the 1851 treaty negotiations in Champoeg, Oregon (Zenk 1990). Tribal census records list Hudson as "full" Santiam (Whitlow 1988), but he is said to have had a Tualatin Kalapuya father and an Ahantchuyuk mother. His wife, Margaret, was said to be the daughter of a Mollalla "chief," but census records also list her and her children with Joseph as "full" Santiam. Hudson may have been an uncle to John B. Hudson and a source for much of the younger man's knowledge of prehistoric Kalapuyan traditions.

The first interview is with William Hartless, born and named Sawala in present-day Corvallis and raised on the Grande Ronde Indian Reservation after 1856. Hartless was interviewed by Leo Frachtenberg on December 10, 1913 at the Chemawa Indian School in Salem, Oregon. Based on local archaeological evidence and his own testimony, Hartless may have been born on either bank of the mouth of the Marys River, near the County Fairgrounds along Squaw Creek, near the camas patch on NE 9th and Walnut Blvd. (Zybach 1990 et al.), or near an encampment on NE 29th and Circle Blvd.(Weise 1990). He took his English name from a pioneer family who operated one of the first stores in Marysville, within the Dixon claim, along the Willamette River (Hathorn 1853), and shared the name William with a Hartless son born in 1854 (Mackey 1974).

Hudson was interviewed in the early 1930s at the Grand Ronde Indian Reservation by Melville Jacobs.

Fig. H.3. "A Kalapuya Lad," 1841. This boy was probably sketched by A. A. Agate, a member of the Wilkes' expedition, near the same time and location as Fig. 5 (see Chapter III). As a survivor of the plagues of the 1830s, it is possible that this young man later attended the 1851 treaty negotiations in Champoeg (Carey 1971). He would have been one of the last members of his nation to remember Benton County before it was settled by pioneers, and would also have been about the right age to have fathered William Hartless.



Part I. William Hartless, Chapanafa Nation, 1913

COYOTE, PANTHER, WHALE, THE FLOOD, SECURING FIRE

Panther lived there (with) his brother coyote, they lived together. Panther hunted all the time. (As for) coyote, he worked, he got firewood, he picked hazelnuts and berries, he dug camas. That was his work. Now then one day panther went away to hunt. A woman came, she peeped inside. (Coyote said to her,) "Come in! Sit across from here. My brother's (panther's) place (bed) is there." So then the woman sat (there). Now then panther's bow broke (a sign of ill omen to panther.) He said, "I will go back (home) now then." And so he did go back, he got home, he looked inside, a woman was seated (in there). "Come outside!" The woman indeed came out. "Come along! Follow me!" Sure enough they went on, they got to the water. "Take off your clothes!" Indeed the woman undressed herself. "Go swim!" Sure enough the woman swam. "Dive in five times! Now come out! Dress yourself!" Indeed the woman dressed. Now then they went back (home), and they went into the house. Now then they lived together. He made her his wife. The woman was a whale being (she was whale's daughter, and she had to bathe in order to become panther-like). Again indeed panther went to work, he went to hunt.

Coyote remained. He worked at home. He got firewood, he speared (salmon). That was his work. Now then one day panther said, "Oh have you no relatives where you come from?" "Yes, they are alive (there). My father is living (there), my mother is living (there), my sisters are living (there)." "Oh. You better go to visit them then." "Well I will go then. In five days I will go." Sure enough on the fifth day she went. Whatever she took along just rolled along behind her as she went along. She got into a canoe, all the things went into the canoe (too). Then she went on (across), she arrived. Now she entered the house of her father. "Oh have you come?" "Yes. I have arrived." How long will you remain?" "Five days, (then) I will go back." "That is very good indeed. (But) it is too bad you will be in such a haste to go back." Now after five days she went back, she took along salmon and eels. It was her father's food she took along. Now she went back, and then she reached her husband's house. She went in. Coyote was there. It became dark. Panther arrived, he brought deer. Again the next day he went away to hunt.

The woman worked at home, coyote cut wood. Now one day the woman said, she said to her husband, "My father said to you to come visit us." "Oh that is very fine. We will go in five days." Indeed they made ready. (When they went) in the very same way again the packs just rolled along behind them. He and his wife went together. Coyote remained at the house. Panther went along together with his wife. Now they got to there. They went in. The woman's father (whale) said, "Who are you?" "Oh it is just I." "Are you alone? "We have come together indeed. We live together." "Oh," said whale. Whale was facing to the rear. Now he arose, and (after turning around) he sat down. He said, "Oh so have you arrived?" "Yes. I have come now." "Oh it is fine that you have visited me." So they remained. It became dark, they went to sleep. Early the next morning they arose. He (panther) just expectorated his spit, the fire blazed up, it sounded prrr. Now they then all got up, they ate, they finished their meal, panther went hunting. He brought back a deer. They remained five days before they went back. Panther said, "We will get here again indeed." Yes," said the whale. You must visit us all the time (often)." "Yes," panther said. "Let us go back now." So they went away, they went back, they got back home. Coyote was there. Now panther went hunting again indeed.

The woman stayed there (and) she worked. Coyote cut wood. Now one day coyote brought wood, (only) he brought one willow twig, and then he built a fire. The woman was in the other side, she was working. Now the (burning) willow crackled and popped, it (a spark) dropped on her foot, The woman lifted her foot, and he thought he saw something or other indeed (he thought he saw her privates.) "Wonder what I should do?" said coyote (to himself). Then coyote went outside, indeed he again went for his wood (cutting of firewood), and now he brought back a lot of willows. Then he burned only that (kind of firewood). Now it was crackling and popping it (one ember) dropped on the woman's leg.

Now the woman said, "*tu'tu'tu'*." She lifted actually both her legs, and then he saw what he was wanting to see.

Now coyote went out, and he went to swim. Now he got to the water, and he defecated. Then coyote dived in, and he came out, and he said to them (to his feces), "How do I look?" His feces said, "You have not become different yet. You are still a coyote." Coyote became angry, he stepped on and wiped away his feces. Once again he defecated indeed, coyote dived in. He said to his feces, "How have I become?" "You are still a coyote." Coyote became angry again, he mashed his feces. He did like that five times. The fourth time he dived, he said to his feces, "How have I become?" "You have become a little changed now." Coyote said, "Stay right there!" He defecated again, he dived in again, coyote addressed himself to his excrements, "How have I become now?" "You have indeed become just like your brother (like panther) now!" "Oh that is fine."

So he went back, he went a long distance (in a circle) around the house, and then he went inside. The woman was (seated) there. "Oh," said coyote, "Let us go visiting." The woman said, "All right." Now he pushed her over on her back, and then he copulated with her. (After that,) coyote said, "We will get ourselves in readiness tomorrow (to go)." Then coyote went out. It became dark. Panther arrived, panther thought nothing (had gone wrong). "But where is coyote?" said panther. "He may have gone somewhere or other." "It is his own heart that way (it is up to him), wherever he may have gone." Then when the next day came, panther indeed went away to hunt. Now coyote got back, he said, "Now let us go." And the woman said, "It is well indeed that we go." So then he pushed he over on her back, coyote copulated with her (again). Now coyote had copulated with her twice. Then he fixed himself up.

So now they went away, they got to there (to her father's house), and they went in. There they stayed. In the morning they got up. The woman said, "Wake up." Now coyote expectorated (he threw his spit) into the fire, it made just a little sound - *luf*, and then it went out. Coyote expectorated (threw his spit) again, again it burned only just a little, it just sounded *tcis*. So coyote got angry. He arose, and he said, "What is the matter with this (fire)? It does not want to blaze." So then he fixed the fire, before the fire would burn. Then they got up, and he went away to hunt. All day long he sought frogs. At last he got one, he transformed it into his deer and then he went back. Coyote reached home, he brought back his deer. Now wanted to take it inside. Then he said, "Hold on! Hold on! (wait!)" He had forgotten (to make) its tail. So he got a fir cone, he made its tail of it, and then he took in his deer. Now they went to sleep. And in the early morning they awakened. Again coyote expectorated (he threw his spit) into the fire. The same way again it merely foamed and spit (like wet wood in a fire). Again coyote was angry, so he got up, he fixed the fire, he went away indeed to hunt.

Now the panther's bowstring broke (a bad sign), and so panther went back home (to investigate). Then the woman's sister said, "What did you so that you brought coyote? Where on the other hand is your husband?" The woman did not say anything to her, panther's wife (did not say anything). Again she said to her indeed, "What did you do to bring him? Do you not know it is coyote you have brought?" Panther's wife said nothing. Now panther got to his house. No one was there. Panther stayed alone overnight. Early the next morning he got up, he went to swim, and then he followed along after his wife. He got opposite there. He took his knife. Then he hallooed, "Oh! Coyote's wife come get me across." Panther said, "Not you! I want coyote's wife to take me across." So that woman went back, she went inside, she struck her sister with a paddle. "Go fetch your husband he says." There was nothing else for that woman (of his) to do. She was pregnant. Panther hallooed again, "Coyote's wife! Get me across." Indeed another of her sisters put down her canoe and she went, she went across. "Oh not you!" said panther, "I want coyote's wife to take me across." So she went back too, she got to the house. Indeed she also hit her sister with the paddle. "Go fetch your husband he says." Now then they put down her canoe, and they placed her in the canoe. Now that woman went, panther's wife. She had almost gotten across when in leaped panther. He tore open his wife's abdomen, panther took out her (panther) baby. Her five coyote babies he left there (in her womb). Now he jumped back ashore, he ran on.

Now then coyote dammed up the water below stream, in order to get his own coyote children. [Then the water became angry, the water rose, all the land went under water, everything drowned, except at Alsea Mountain (probably Mary's Peak near Corvallis, Oregon).] It stood out a little, it stuck out (above the flood waters). The deer was standing in the water, that is why its tail is white. After five days the water went down. All the people had died, indeed all those things (people) were all like that now (were all dead).

Now there was no fire. Humming bird was sent first. He came (only) to here (he did not go far). Then copperhead snake was sent, and he went, he actually went on to here where the sun rises, he went to steal it, indeed he went. Now he got the there, he stole the fire. Now then he was pursued, he went into a hole in the ground, he went out of sight in the brush, finally he won (over them) everywhere. Now then when copperhead snake came along, he got to the ocean coast. "Wonder what I should do with this fire?" So he took it in his teeth, and he swam (across). It burned his mouth. He went across at last. He brought the fire to where panther was. Again indeed they had fire.

Go swim! Always keep what I have given you.

Part II. John B. Hudson, Santiam Nation, 1933

1. THE GOOD OLD DAYS

This countryside is not good now. Long, long ago it was good country (had better hunting and food gathering). They were all Indians who lived in this countryside. Everything was good. No one labored (at hard labor for wages). Only a man went hunting, he hunted all the time. Women always used to dig camas, and they gathered tarweed seeds. Such things were all we ate. They gathered acorns, they picked hazelnuts, they picked berries, they dried blackberries.

<u>People Spoke to the New Moon</u>

Long ago when the people saw the (new) moon then they spoke to the moon. They said to it, "We are still (alive) here yet. We see you now that you have come out again, (and) we are still (alive) here yet."

<u>Personal Names</u>

Long ago the people, all the people, had names. Now when he (one of the people) died, no one would ever utter his name. If any other person pronounced his name, the name of the person who had died, then if the relatives of that person who had died should hear that name being pronounced, they would maintain that that was a very bad (insulting) thing, (and) sometimes they would fight about it. They used to say that no one who was a different (unrelated) person could utter that name, when they were dead. It was indeed only his own relatives (who could). Then (after quite a while) they would call (some child of theirs) by that name. That is how they always did, that is the way they always did it is said. This is what they used to say. That name was always there (it remained within the family). Whoever those people (relatives) were who had a child, and who were relatives of those who had died, they would name a child with that (deceased's) name. That is how they always did. Other people (non-relatives) could never just simply call it (a person or a child) by a name.

2. MAKING BOWS AND ARROWS

Long long ago when the people made their bows they made them of yew wood. They made their bows of that. They split it, they scraped it with mussel shells, and with this sharp rock. That is the way they did it when they made their bows. They were good bows. Then when there were finished (scraping) they would warm it, and then they would rub on it grease which they had heated. Now when it became dry the bow would always be stout (strong) they say. That is the way they did it. It was a good bow which they made. But as for these children's bows, they did not grease them. They just made them (without greasing them). When they finished (making a bow) in the same way they would make their arrows. When they were finished (making them) they would heat them, and then they would straighten them (still warm, using hands and teeth). They say that that is the way they used to do it when they made their arrows. That is how those old people spoke of it.

Blind People Made Arrow Points

The people used to say long ago that the blind persons made the arrow points. A blind person could do nothing, he could only make arrow points. He would do that all the time. That is what they used to say.

Ropes and Snares

The Indians made their rope long ago of small round hazel (sticks). They got it, they twisted it (with their hands). When they were through their twisting, then they made rope of it.

And another kind of rope they made, they made of willow bark, that is the bark that is white, (and) it is underneath (inside). Long ago they made their rope of it. They placed that kind of rope, they hung it on a deer trail, where deer went by, there he would put his head through it. They had it tied to a small stick (a sapling), it was not a very large stick. Then he would choke himself. That is the way they used to kill deer long ago. They did it that way sometimes.

Elk Pitfalls

And also long ago when they killed elk, the people would dig a hole in the ground there on their (the elks') trail. They would dig a very deep hole in the ground. And then they would place small sticks on top of it, and they would put leaves (as camouflage) on top of the small sticks, there on the elk's trail. And then the people would go away. Sometimes they would dig perhaps two holes. Then when they would go along, no then they scared the elks, and they (the elks) would go along on their trail. Now then some of the people would run along behind (the elks), and the elks would go (fall) into where that hole (pitfall) was in the ground. Now then they would kill the elks (in) there (by clubbing). That is the way they did long ago it is said. When they killed them, then they took them out. And now there was a lot of meat for them. They took it back to their homes.

Hunting Grizzly Bear

A long time ago when the people when to fight (hunt and kill) grizzlies, they say that a great many people went to where the grizzly lived. It is said that one man took a long pole, and he would go on ahead. Then when they reached the grizzly's abode, now some of the people got themselves in readiness. They fixed their bows and their arrows. Some of them stood here, some also stood here (there). And the one who bore the pole stood in the center. Then he poked at the grizzly's door (of his den as) he held on to the pole. Now the grizzly became angry, and he came out. Then the man who held the pole stabbed the pole into his breast (heart). Now the grizzly stood up, he seized the pole too, and he bit and chewed at that pole. Then some of the people who stood at the sides, now they were shooting at the grizzly, while the man still held on to the pole. They say that is how they would do when they killed a grizzly. Some however of these people who would hold the pole would not be strong (enough) when the grizzly approached. And then that man who held the pole, when he wanted to poke it into his breast, then the grizzly would simply raise up that pole, while he went right by it, and then he would seize that person (and) he would bite and chew him up. Then they could not kill the grizzly when the grizzly seized the person who held the pole. But when he did know how to hold the pole, then the grizzly would (only) bit at the pole. That is how they always did it when they killed a grizzly they say. The one who knew how to hold the pole always kept it poked into his breast. The grizzly was unable to raise the pole away from him, (and) he would (just) be fighting at that pole. Then those people would be shooting at that grizzly, and then they would indeed kill him there. That is what those people used to relate a long time ago so they say. I myself heard that when they used to tell about it.

Long ago those old people would say (to some one person), “You are not strong. You could not wield a pole, and be poking at the grizzly to make that grizzly angry. You would be getting quickly out of the way when the grizzly came out towards you. Your heart (your courage and your guardian-dream-power) is not strong. You just talk (about your prowess). You are not strong (hearted). On the other hand that one (who)—he is very strong at heart, when he pokes at a grizzly when it gets angry at him, (and) when it comes out towards him. He (a person of so strong a heart) does not get out of the way, when he pokes the pole into its breast.” That sort of man we say is a stout (brave, strong) man, and his heart is stout too. He does not just talk. It is indeed just whatever he says it is (he is honest about his claims).

Sometimes when he sees a person the grizzly gets angry, (and) goes, (and) kills that person. And then he eats him so they say. But on the other hand sometimes he does not get mad. Rather he does nothing to that person. That is what they say. It was principally the female grizzly who had young ones, she was very harsh of voice (mean, irritable) when she had the little young ones. The people feared her very much (then). They would say, “Go far away from her!”

They did not like to eat its flesh. They said, “Its flesh is bad. That grizzly eats persons they say.” So they did not want to eat grizzly meat.

Trout Fishing

Long ago when people fished, they made it of a person’s (head) hair (a tuft of hair on the end of a rolled white inner bark of willow fishline). They fished trout with it. When it bit the hair it got hung on to it by its teeth, and then they pulled it out (of the stream). That is how they did it when they fished, so it is said.

3. SHARING MEAT

When a man went hunting, (and) when he killed a deer, then when he brought it back, (and) he had gotten back home, then he shared small pieces of the meat around among the people. They always did like that so they say.

Boiling of Foods

Long, long ago, when they (woman) boiled their food (meat, etc.), they took their (bark) bucket, and they put water into it. Then they cut up their food when they wanted to boil it. And then they built a fire, they heated many stones. Now when those stones had become hot, then they put them into the (water in the bark) bucket. And then they put their food into the bucket and (they put in) water too. Now the hot stones were put into the bucket (of water). Then the water would boil. And when a stone got cold they took out that stone, and they put in another hot stone again. Then their food would boil, and so whatever they ate became cooked. And the water, they call it soup, they would drink it too. When they ate they would also drink the soup. That is the way the people used to do long, long ago. They boiled salmon, they boiled eels, they boiled deer meat. That is what they did to their food. They also boiled acorns. The thing that they fixed their fire with, when they built a fire, and with which they held the hot stones, I do not know (what) its name (was that they called it.

Camas and Some Other Foods

Long ago the people after they had dug a hole (for acorns), then they would build a fire right there (in the hole). Now they would put a lot of stones (on top of the fire). Then when the rocks got hot, then they would say to a shaman, "Look at the rocks now! Is it all right for us to put our camas on them?" Now then the shaman would step (barefooted) on the hot rocks, he would cross over on them, he would look at his feet, and he would say, "Oh pretty soon the camas will be good (well cooked)". That is how they used to do once in a while. So then they placed all their camas (in it) there. They always put (in) large quantities of (wide) maple and ash leaves, they put them in first (on top of the hot rocks). Now then they put (in) the camas. And then they placed leaves on top of the camas. Now then they covered it over with earth. Now they built a fire on top of rocks (placed over the oven), hot rocks were under it. That is how they did when they prepared cooked camas. And they were (in) there for three days, (though) once in a while for (only) two days. Then the cooked camas became done. When they covered their raw camas (in the ground oven), one woman put in her raw camas first, and she put some few leaves (on them). Then another woman, now she put in her own raw camas, and she put on them a few leaves. Now then another woman put in her raw camas. That is the way they always did. Now then they all knew where they had placed their (own) raw camas. Once in a while they would examine (the oven) where they had placed their raw camas. They dug a hole in, they pulled out one of the uncooked camas, and they looked it over. It would not be quite done yet, so they would put it in again. Now then they built a large fire again (on top). When they at length (again) took out another camas, they would look at it, and now it was done. Then they would say, "This cooked camas is ready (done) now." And they would wait till it became cold, and then they uncovered it, and they gathered up their cooked camas. That is the way they always did. Now that it had become cooked camas, they dried some of it in the sun. And they took care of it (turned it over) all the time (it lay drying). And when it was dried, then they put it away. They ate it in the wintertime, when there was a lot of snow on the ground. Then they ate the dried cooked camas. That is what they always did.

That is the way they did with everything. They always put it away. They dried Chinook salmon for the wintertime, and then they ate it. They dried meat, and in the wintertime they also ate hazelnuts, and acorns, and tarweed seeds, and dried berries. They dried all sorts of things, (and) in wintertime they ate them at the time when there was a lot of snow. They dried eels which they ate in wintertime. In summertime they picked tarweed seeds, and they dried them on the fire, and when they were done, then they put them away. Now long ago the people had a large rock which had a hole (concavity) in its center (i.e., a mortar), and they mashed their tarweed seeds in it. Sometimes they (also) mashed their cooked camas (in the mortar) where they mashed the tarweed seeds. And when they were through, then the people ate what was mashed which they had pulverized. They mixed hazelnuts, and cooked camas, and tarweed seeds, (and then) they ate their cooked camas and their tarweed seeds and their hazelnuts.

Acorns

When acorns ripened on oaks, and when the acorns fell down, then the women would gather those acorns (that had fallen). They would pick up quantities, they would put them into their soft-bags, and they would take them back to their houses. Now then they would roast them in hot (coals in the) ground (till they cracked). And then they would take them out, and now the acorns would be (seen to be) cracked. Then they put away its (their) flesh (meaty part). They dried the acorns' flesh (meat—they were laid in the sun either on the ground or on tightly woven rush mats). Now when they wished to eat (some) they placed it (basket and acorns in it) in water (to soak) maybe one day and one night (to remove the bitter taste). And then they took the acorns out (of the water), and they boiled it (them). When cooked they ate it. That is the way they did.

Drying Berries

Long ago when the people (women) used to dry their berries, they would put some of them on paper over a (flat hewn) log, while they would place others on gunnysacks.

Now they poured their berries over them (on the log or sack), (and) there their berries would become dry. And they would place others on longs, these logs they (the women's husbands) had chopped on top to make the log flat. Now there is where they (the women) always poured (spread out) their berries (to dry). The person who (the wife of the man who) had fixed (hewn) that log (flat on the top) was the one whose log it was, (because) he had fixed it. There they (the women) dried their berries. That is the way they always did it, when they went to the mountains for their berries. That is how they always did. The men would go hunting, and the women would go to pick berries.

Eating Grasshoppers and Caterpillars

When it was summertime they burned over the land, when they wanted to eat grasshoppers. When they burned the land, then they burned the grasshoppers (too). And then they (women) gathered up the grasshoppers, and they ate those grasshoppers it is said. I do not know what they did to them, when they wanted to eat them. Maybe they cooked them, and on the other hand perhaps they did not cook them. I never saw them eat them. Those people long ago only spoke of it.

And another thing too that they ate, they called it caterpillar—that was its name. When it was summertime they (women, perhaps men too) gathered that caterpillar, at the time when there were quantities of caterpillars. Those caterpillars ate the leaves of ash trees. Now then they (the people) made ground holes, small holes (six or seven inches deep, round, two feet wide, away from the trunk of an infested ash tree), and then those caterpillars would fill up the holes in the ground. Then they would gather up the caterpillars (which were thick in those holes). That is the way they did. And they took them back to their homes and they boiled them. And so when boiled, then they would eat the caterpillars. The whites call this caterpillar 'caterpillar.'

Eels, Bark Buckets

Long ago the people (the men) used to get eels in small streams (creeks), the eels that had gone into the small streams that had left the big-river (the Willamette). It always has a great quantity (too much) of water. Eels could not ever be gotten by them there. (But) in the small streams, there where there are small waterfalls, at such a place there were always quantities of eels it is said. They (eels) would be going upstream. Always at that time when it was getting near to summertime, they would catch eels. But on the other had at the falls (at the great Oregon City falls) there would always be quantities of eels in the summertime. They would be fastened on the rocks there at the falls. Quantities of eels are always there. They would catch them just with their hands. And when they had caught them they would break their necks. That is the way they used to do at the (Oregon City) falls, when the people caught eels. All the people got their eels at the falls. When the eels were at the falls the people would say, "The eels are quite fat." When they wanted to eat eels they always roasted them, when they had cooked the eels, then they ate the eels. And when they were through eating they put away their roasting spits. They put them away. They always took good care of their roasting spits. That is what they did.

Long ago they used to get eels in the night time. When they got them at night they obtained pitchwood, they lit the pitchwood (brands), and they held them. Then they went back into the stream. And when they saw an eel they seized it close to its neck there, where it has little holes. They say it is a little soft there. Then they broke its neck when they seized it. And they also held onto the lit pitchwood, so that they could see the eels. That is the way they used to do in the night time to catch eels. They split the pitchwood. And they tied the (split) pitchwood) in several places. They took it at night when they went. They lit that pitchwood. That is how they used to do long ago it is said.

Sometimes too in the daytime they would get eels. They would just go to the stream, there where they saw eels they would catch them, all of them that they saw. They would always seize the one that stayed to the rear. They would never catch the one that was ahead. If they seized the one that stayed in front, the others that were behind would all get away. But if they did seize the one to the rear, they would catch all those eels.

When the people (the men) had caught eels, and when they had come back to their homes with them, then the women split them (lengthwise). The eels they did not want to eat at once, those eels they dried. When they split them they put them up above (on drying frames made of four upright forked poles, with many cross poles). And there underneath they built a fire. It was not very hot. They smoked them with the smoke (of the fire beneath). That is the way they did when they wanted to dry them. However when some got dried they placed them (in storage). That is what they did for their winter food. That is what they always did with their food. They said that they put others into soft-bags, and they hung them up above from a tree. There they put their food to be eaten in the winter. That is the way they did it is said.

They put their food into buckets, they were of ash bark. They peeled off the ash bark, they made buckets (of it). They sewed the bark together (using string made from willow bark). Long, long ago they called that their bucket it is said. And they (also) made their buckets of maple bark. Some made their buckets (also) of this cedar bark, they made their buckets of its bark. That is the way they always used to do long ago. Now that is all I know of that.

4. BASKETS

The soft-bag (a pack-sack basket) that they had was always for their packing (carrying things on their backs). Whatever they picked (e.g., acorns, hazelnuts, camas, tarweed seeds, pussy ears) they put into their soft-bag. When they dug camas they put them into their soft-bag. When they gathered acorns they put them into their soft-bag too. For everything that they did they always carried along with them their soft-bag. The soft-bag was the women's thing for packing (for general carrying). That is the way they always did so it is said. And another one (basket) in addition they named their storage-basket (of hard splints). Still another one (was made) like the storage-basket indeed (i.e., hard, shaped like a shallow pan, tightly knit; Eustace Howard said it is more like the soft-bag in the technique of weaving), (with) it they prepared tarweed seeds. I do not quite well know what its name (was). I do not know how they did it (wove it) when they manufactured them. But I myself saw (some old ones used) when they prepared tarweed seeds (with them). They had them (they were made) rather like storage-baskets indeed (like the soft-bags, according to Howard).

<u>Skin Blankets, Grey Squirrel Meat Cooked</u>

A long time ago when the people killed gray squirrel, then they kept the skin. And when they killed gopher they kept its skin too. They made their blankets of everything that had a skin. They sewed them (the skins) together (probably with deer sinew), and then they made it large (a large blanket), and then they wore it. That is how the people did long ago it is said.

They roasted some (grey squirrels) in hot ashes. They say that is what they did. On the other hand they roasted others (other grey squirrel meat) in hot coals. They say that is what they did to their food (meats of various sorts). Long ago when they boiled their meat, they put it in a bucket, and then they put water in too, and then when they had put in their meat, then they put in hot rocks, and then their meat was boiled. Now then it got cooked. Then they ate their meat, and they also drank the meat's juice (broth).

<u>Moccasins</u>

Long ago the Indians made their moccasins of deer hide they say. They cut the hide, and then they made moccasins of it. They sewed them with (deer) sinew. The sinew was their thread. They put on their moccasins when there was snow. But when there was no snow they would go along without moccasins. Only in wintertime did some of them put on their moccasins. They made their moccasins of deer hide. That is how they always did they say.

Leggings

They wrapped leggings around their legs. Wherever they went the women wrapped (leggings) around their legs. The men also wrapped their legs the same way. It extended from the knee and down to the foot (ankle).

Hats

Whatever it was they called a hat long ago, the people's (Indians') hats, I never did see what kind of hat theirs was. I only heard when they were storytelling that they mentioned hats. And they said that old women wore hats. I do not know just where the people were who used to always make hats. I only heard about it.

5. NAKEDNESS

Long ago the people had no garments (for everyday wear). They had nothing on. Men wore no clothes. The women likewise had only something here on their front. They covered their pubic region.

Tattooing and Other Skin Markings

Long ago some of the people used to mark (tattoo) their faces it is said, while some others marked (burned spots on) their hands and arms. And the young fellows and girls would say to one another too, "Let us try our hearts (our fortitude against pain)." They would put fire on (their hands), and then they would burn (spots on) their hands.

But some others would mark (tattoo) their hands and arms. They fixed up a (sinew) and a needle. They greased that thread (and rubbed on) charcoal on the thread. Then they stuck it in (the skin of) their hands and arms, they stuck through (their flesh) the needle which had the (grease and charcoal) thread. And then they pulled it where they had stuck it through their flesh. This marked (painted) thread was marked (painted) with charcoal. That is the way they did when they marked (tattooed) their hands and arms.

But indeed when they burned (spots on) their hands and arms, the young fellows and girls competed at who was stronger in his heart (who was braver against pain), when they burned their hands and arms. Long ago some of the people indeed whenever they had a hurt in their body they burned it (a spot on the skin there) they say. And there where it hurt they put fire on it. That is for what the whites call rheumatism now.

6. MEDICINES

Some of the Indians long ago knew what was good when a person became somewhat ill (not seriously ill from a poison-power). They would prepare medicine (some herb). If he did not go outside, if he did not defecate (if he was slightly ill from constipation), they would peel Chittum bark, and they would boil it. Then when its water became cool, they would give it to that person. That person would drink it, and sure enough his belly would hurt, and that person would go have diarrhea.

Or if he would not be feeling good in his heart (if he felt slightly indisposed), they might give him bitter-camas. They might give him two bitter-camas. And then that person would eat the bitter-camas, and in just a very little while he would vomit, and he would vomit for quite a while. He would vomit a lot of that slimy-bilious-yellow-stuff. That is what they used to do it is said.

When persons got a cold they would not give them anything. They would say he would get well pretty soon. It was just nothing but a common cold, so they would say.

7. SMOKING

Long ago when the people smoked their tobacco, they mixed in it (kinnickinnick) leaves. They picked those leaves by the ocean-coast they say. That leaf was very fine when they mixed that leaf in, when they mixed it with their tobacco. Then they put it into their pipe. And they lit it, and they smoked. And they swallowed the smoke, they expelled (exhaled) the smoke from their nose. They expelled it many times from their nose, and then they became dizzy. That is how they used to do when they smoked. They did not just puff and puff and puff. They always swallowed their smoke. That is how they did when they smoked.

Their pipe was of stone. And there where they bit it, they put in a small round stick (stem). When they finished their smoke, they pulled out the little round stick (the pipe stem), which when they smoked they held between the teeth in their mouth. They lay it by (beside) their pipe, when they took out the round stick. It was not very long. And the stick had a hole through its center. And they fitted part of the stick into their pipe. They held it in their teeth when smoking. Other pipes, however, that were long (one piece stone pipes) were pipes that were held in the teeth (they had no wooden stem and so the stone was held in the teeth), when they smoked such long pipes. On the contrary (in) the short pipes, they fitted short round sticks into them, the stick having a hole through the middle. That is the way they always did.

Killing Aches with Burning

Long long ago the people, they say that when a knee ached (with rheumatism), they put fire on it, they applied fire to it. They got cedar bark, they got it (and) dried it. And when it had become dry, they took it, they put it in their mouth, they chewed it with their teeth. When it had become very finely chewed up, then they took it out of their mouth, and they took it in hand, and they made it into round balls (triangular pellets the size of very large pills). Then they dried them, and when they were dry, then they put (one of) them on a person's knee where it ached. If a person's hand ached, they applied that dried round thing there likewise, (or) they put it on that person's knee if it hurt. Then as it rested there on (on the painful place), then they set that bark (pellet) on fire, and the bark burned (very slowly), and all of it burned. When it all burned down it popped off. When it popped they would say, "Oh that will get well now!" (because the fire has killed the cause of the pain.) But if it did not pop, they would on another (pellet) close to it where it ached. That is the way they did. Whoever had a knee that ached, they would say (to him), "Well, do you not put the fire where it hurts? If you put a fire on it you might get well."

Carrying Fire on a Journey

Long ago when some of the people went to the mountains to hunt, they carried fire with them. They put a (hardwood) burning coal in, they put it inside some little rotten wood, and they put the fire in mussel shells, in between the mussel shells. They took two mussel shells, they put it (the burning coal) between the mussel shells, they closed the shells together. And then they wrapped it (all) in fire ashes. That is how they did when they carried fire along when they went hunting. That was when they lacked matches. That is how they did so they say.

8. OWL CALLS AND SLAVE RAIDS

A long time ago the people used to relate that different (foreign, usually non-Kalapuya) people, when they went away, they would go to fight in order to steal (people from bands) where they obtained their slaves. There they always fought in the early morning. When it was dark the people (the slave raiders) would come close to those (village) houses. Some of these people (raiders) would make themselves (as if) owls, they would make sounds just like owls. When they made their voices like that there, the other people (their fellow raiders) would understand what was said (sounded). The people who lived in the houses (of the doomed village) would not know anything (would not interpret the hooting as other than real owls). When it was early morning then they would enter the houses, and then they would kill the people. And those whom they did not want to kill they would keep for their slaves. When they went back home they would take them (the captives) along. But some of those (enslaved) people would go flee, they would not get killed.

They would always be watchful there when they knew (heard) an owl was making noises in the nighttime. Or if a screech owl was talking in the darkness they would say, "Wonder why it is doing like that? Maybe (foreign, non-Kalapuya) people are going (scouting) around." They were always fearful when they heard an owl in the nighttime. They would say, "Maybe it is a Molale who has made himself (like) an owl.

The Hoop and Arrow Game

The people called it the hoop. They all played with it when the people assembled. Then indeed they played with the hoop. Now then they threw it, they made it roll along, and then persons would shoot at it. Now once in a while one of them would hit it when he shot at it. The others would miss it. That is how they did it all the time so they say. I myself did not see them play it. That is the way the people used to talk about it. I myself only heard about it. When they played it some of them stood here, and others stood yonder. Then those who stood here threw and rolled, and those others shot at it when it passed, when it passed there where it was marked, now then they shot at it. Now those other people took it, and they threw it too. They made it roll along, and then these others stood here and shot at it. That is the way they always did so they say, when they played. That is what they said. I myself did not see it.

Playing the Hand Game

Long ago the people (men) when they played (gambled at) the hand game they always took good care of their hearts (prepared themselves, watched their gambling dream-powers). They always sweated (in the sweat house, before gambling), they swam (after sweating) in the early morning. Those who had wives did not copulate with their wives. If he were impure-from-copulation he would never win anything. A man smelled all over when he had copulated. Long ago when you copulated it would be five days again before your body became good (odorless) again. Those men (who gambled at the hand game) were always swimming (to cleanse themselves), and those others who swam (were unmarried). They (hand game players) sat at both ends (of the long row of players). And the one who counted the sticks (the point counts), he too was always swimming. The one who was in the center, he also always shot at (guessed at) the gambling-bones. And when he had hit (guessed) the gambling-bone, then he sang, and now the rest of the people (the row on his side) all sang (too). Now (after winning the gambling-bones from the row of opponents) that (center) man would take all four of the gambling-bones, he would shake (make various passes and deceptive motions with) his hands, he would throw the gambling-bones up in the air, he would yip (short high pitched falsetto cries), and then when he caught the gambling-bones he threw two gambling-bones to the end (man on his own row), (and) the two (others) he threw that way (in the other direction) likewise. Then they all sang (while the opposite side in its turn guessed where the bones were).

Firs Dance

Long ago the people would say, "Now the wind is blowing hard. Now those firs are dancing." And then when one fell, it fell for all time, it would never get up again. (But a person) always went (merely) into a (temporary) trance in his (spirit-power) dance (and got up again later).

9. SUMMER WINDBREAK SHELTERS

Long ago (in early reservation days at Grand Ronde) when the people made their houses in the summertime they put up a tent. Then they cut wood, fir limbs. Then they stood them up (leaned them against a frame) outside as large (about eight or ten feet in diameter) as their house (as their roofless windbreak was to be; the boughs made a fence wall four or five feet high). They fixed their house (this windbreak, under) where a fir tree stood. Others (placed it) where an oak stood, they constructed their house (summer windbreak) close to (under) the oak. They always built their house (windbreak) where a tree stood, preferably underneath) a large tree. That is the way they did in summertime with their houses. I do not know how they made their houses for wintertime.

Winter Houses and Sweat Houses

Long ago the people had a (type of) house, a winter house. They had a large house. They dug down in the ground a short distance. And they placed fir bark on the top of it. And some threw dirt over their house. There in the center (of the roof) was a small hole, the smoke went out there. And they had one door for it. They lived in it there when it was wintertime. In the summertime they made their house of fir limbs. That was the sort of house they made in the summertime.

Now the people always had their sweathouse. Some of the boys and girls slept in the sweathouse.

Sometimes with the people, when one of their relatives died in their winter house, they would all go outside, they would go to another house. And then they would build (a fire) in the house where that person had died, they would build a fire of white fir limbs (keeping it burning) during five nights. Then they would come back to the house. It is said that that is the way they always did.

Long long ago when people made a sweathouse, they would fetch small round sticks, they obtained (soft green) hazel sticks. And they set them in here and there with both ends in the ground. And they pulled them all over the top of it, and they tied them (giving a frame of semicircular shape). Then they put white fir boughs on top, they put on many white fir boughs. Now when they threw over it they threw dirt all over it. But they had only one little door for it. They dug a hole in the ground at one side of the door (inside). There they put the hot rocks. That is how they did when they sweated. When any of them entered it there, then they would shut the door. They took (and) brought water inside. When a stone got a little cold, they would pour a little water on it, and then the stone would become hot again (i.e., steam would come from the rock). That is how they always did when they sweated.

Now when they came out of the sweathouse they would go to the water. And there they swam in the water. Now then when they finished their swimming, they would come out of the water. Sometimes they (then) quit their sweating, but on the other hand they sometimes went inside again for (more of) their sweating.

Bad Months of Late Winter

That moon (during that month), the people said, that moon some of the people ate their moccasins. It is an extremely bad moon (month). When that moon went by, and the next moon was indeed approaching now, then grouse sang. Now then they addressed the (new) moon. They said, "We are indeed still (alive) here. Indeed now we have been dying in body (we have been starving)." Old people (thus) addressed the (new) moon. And then when these grouse sang, (if) that was the time then when snow fell hard, now the people would say, "Oh this is just a mere nothing. It is (only caused by) grouse's spirit-power-song) that there is snow." That is the way the people would speak. "It is because of the spirit-power-song of grouse that it is like this."

10. MYTHS SHOULD BE TOLD IN WINTERTIME

The people used to say, "It is not good to tell myths in the summertime. Perhaps a rattlesnake might bite a person, or a yellowjacket might sting a person, should one tell myths in the summertime." But they do tell stories during wintertime. It is good to tell myths in the wintertime. There are long nights in wintertime.

Seated During Storytelling

Always long long ago when people told stories (myths), all the children would sit on the ground. No one would be standing. The ones who told the stories would say, "If you stand (during a myth narration) you will become humpbacked."

Panther, Coyote, Whale's Daughter, the Flood, Obtaining the Fire

Panther's house stood there. His brother coyote stayed with him. Now panther was always hunting. Coyote himself prepared wood (firewood), they built the fire with it. Then one day whale's daughter came, and coyote was present when the girl arrived. Now Coyote said, "Do you want my brother, panther?" And the girl said, "Yes." Then Coyote said, "Be seated there. It is his bed. He has not come back yet. He went hunting." Sure enough panther got back. When he got back she was seated on his bed. Now she prepared food for them, and they ate. Then when it became dark, they went to bed. The next day panther arose early in the morning, he went to swim (in order to be clean and odorless for hunting). Coyote himself built a fire in the early morning, and the woman prepared their food. And when they finished eating, panther went to hunt. Now then the woman smoke-dried meat. And when it neared evening, he returned from hunting. Then when it had become dark, they again went to bed. The next day early in the morning the panther himself went swimming, while coyote himself always gathered firewood. Now the man (panther) went hunting again, and then he got back again. Now when it was dark they were seated there, and the panther told his brother coyote, "We will be leaving you tomorrow. We will go to where her father is.. You remain, take care of this house. There is a lot of food. Eat what you will. Then we will come back." Then coyote said, "Do that! You go! I will take care of this house. I will be gathering firewood all the time." Now in the early morning that man (panther) went swimming. Then when he got back, and they were through eating, now he prepared his packs of smoke-dried meat. He took them along, he had five such packs. Then they said to coyote, "Now I leave you."

Then the panther and his wife went away. The woman went on ahead. Now the panther told his packs, "Follow me. Now we will be going on." And then his packs rolled along behind after him. Now they were going along. The woman went on ahead. Their packs came along in the rear. When it was almost darkness, they reached the river. Then the woman said to her husband, "You halloo across! Just open your mouth (without making the actual sound), they will hear you directly." And to be sure they did hear. And now right there was a canoe, a canoe came in full view. And it got to there, close (but still) off a bit, and then the woman jumped (into it), and the man (panther) jumped (into it) too. And then those packs of his all came and jumped (into it). Now when they went back (to the other shore), mudfish was (the one who was) handling that canoe. Now they got across, and the woman jumped (ashore), and then the man (panther) leaped too. Now those packs of his also jumped (ashore) behind (them). And so they went to whale's house.

They got to there, and then they entered the house. Now that man (panther) threw his spit into the fire, and his spit burned, it smelled, and the whale said, "a....what I smell is good." Then the woman, whales' daughter, said, "I have a husband." When he (panther) cast his spit in the fire, "Oh," said whale, "I did kind of smell meat." Then when it became dark, they went to bed. The next say the panther went swimming in the early morning. And so he hunted, and he killed a deer, a big fat deer. Now when he got back with it, then he threw down his pack outside. When his pack fell, it said (sounded), lim! (boom!) Now the old man (asked), "What made a thud outside?" Then the woman told her father, "I have a husband there. He has gone back now from hunting." Then the old man (said), "Oh" (in a bass voice). And the old man said (in basso) to mudfish, "Bring inside the meat that he has brought back." So mudfish went outside to get the meat, and he could not bring it in. He said, "Oh it is extremely (too) heavy." Then the man (panther) went, he himself brought it in. Now they cut the meat into pieces, and they prepared a meal, and they all ate, when it had become dark. The next day the man said to his wife, “It is well now that we go back (home).” And the woman said, “It is well now for us to go back.” Then the woman said to her father, “We are going to leave you now. We are going back. He himself (panther) has his brother at the place where we came from. He has been taking care of the house.” So then the old man said, “Oh you will come to visit me some time again.” And then the man (panther) said, “Yes. We will come again some time sure.” Then when they went out, and they went away, and now the old man told mudfish, “Take them across.” So mudfish himself went too, they got to the canoe there, and the woman got into it, and the man got into it too. Now mudfish got in it last. Then they went, and they went across. Then the woman leaped to the ground, and the man jumped too. And mudfish himself went back.

Now the man and woman went on, they went along, and then they got to their house. Now then coyote was there, he was gathering firewood, and now coyote came in. “Oh have you arrived now?” Then the man said, “We have gotten here now.” Then it became dark. They ate. Now when they were through eating, then the coyote said, “Is the trail good to where you went?” And the man said, “Yes. It is a good trail.” Now then they went to bed. Early the next day they arose. The man (panther) went swimming again. And when they were finished eating, he went to hunt. Coyote himself gathered firewood. Now then the man returned when it was nearly dark, he had his pack of deer meat. Now the woman prepared their meal, and when it was dark they ate. Then they finished eating, and they went to bed. When it was early the next morning, the man went for his swim. And when they were through eating early in the morning, he went hunting again. Then when it was nearly dark, he got back, he brought his pack of deer meat that he had with him. Then when it had become dark, he told coyote, “You take her along tomorrow. She wants to go visit her father.” So coyote said, “Done! I will take her tomorrow. You said to me, The trail is good.” To be sure, the next day they made the preparations, and the man fixed five packs, and he told his brother coyote, “These packs will follow directly behind you. You are not to turn and look at them. Keep going all the time. You will reach the river there, and then you are to halloo across.”

Now coyote and the woman went. Then the woman went on ahead, and coyote kept going along in the rear. Now they were going along, they kept steadily going. Then they rested, and the woman sat down, and coyote sat over here (opposite her). Now then the woman lifted her legs, and coyote saw something indeed. Then he said in his heart, “It would be good if this were my own wife. Now I will become (as if) ill.” So then he said to the woman, “Oh I am quite ill. I am unable to go on. I am awfully sick. I will go back now. You wait for him here. I will tell him, Your wife will be waiting here for you.” So then coyote went back. He went along to the other side of the mountain, and then he saw water, a small pond. Then he said, “I will turn into a panther here now.” Now a log was there in the water, and he got on top of it, and he defecated five times on top of the log. Then he dived into the water, and he came out, and he said to his feces, “Have I become a panther now?” They said, “No! You are only a coyote!” Then he threw them (all five) into the water. He defecated (five times) again, and he dived into the water, and when he emerged (he asked this fifth set of five), “Now have I become like a panther?” Then those (last five) feces of his (said), “Yes. You are a panther now.” “Oh that is fine.” Now then he went back to where he had come from, and he had pretty nearly gotten there. Now the woman said in her heart, “It is not panther that is coming. It is coyote.” Now then the coyote got to where the woman was. And so when he arrived (he said), “What is the matter with him that he was ill when he got back? He said, I am ill.” Now he took hold of the woman, and he lay her on her back, and he copulated with her. Then when he arose, “Let us be going along now.” So then the woman went along, and coyote went on in the rear. Then their packs would not come rolling along behind. And the coyote said, “What is the trouble with those packs of ours? They do not want to come along behind.” Now then the woman said nothing. In her heart she said, “It is coyote here who did that to me.” Now they went along, coyote went on in the rear. They got to the water, and the woman said to him, “Halloo across!” So coyote cried out, “Oh take us across! We want a canoe!” He cried out again. Then the woman (merely) opened her mouth, and to be sure now a canoe was coming and mudfish was bringing the canoe. Then it got close (to shore), and the woman jumped. Then the coyote said, “Oh, oh (in fear) come close!” So then of course they came close, and coyote got into it. He said, "Watch out! I might fall." Then they went, they crossed over, and they went along, they got to whale's house.

Now the woman went inside, behind her coyote entered. He (coyote) cast his spit into the fire, and it merely sizzled. It did not smell at all. Now when it became dark, they went to sleep. Early the next day, coyote now went to hunt. He was hunting, he killed nothing. Now it had nearly become dark, and he found a large frog, a bull frog, and he killed that frog. He pulled its ears, he pulled its nose, and he pulled its (hind) legs, he pulled its (fore) legs. "Now turn into a deer!" And sure enough it lay there, it was just like a deer. Then he made his pack (of "deer"-that is frog meat), and he threw it up on his back, and he took it back to the house. Now he got there, he threw it on the ground outside, it sounded just plop when it fell (the sound of a slippery wet object). Then he said, "Mudfish! Help me! Let us take the deer meat inside." So then mudfish came, and they took hold of the meat, and mudfish held its ears. Then when they took it in, coyote pushed mudfish pushed. Now coyote noticed the deer lacked a tail. So coyote said, "Wait a while! wait a while!" Then he searched around anywhere on the ground, and he found a cone, a fir cone. Then he placed that at the deer's (the frog's) anus, and he said, "Here now is your tail!" Then they took it inside, and the women there sliced up the deer, they prepared food. Now when it became dark they ate, and then they went to bed.

Now then when it was dark that panther himself dreamed badly in his dream (i.e. he had a dream which told him of things). They told him (in the dream), "Coyote now, he has taken your wife permanently now." Now early in the morning when he arose, his heart was not good (he felt bad about what he had learned in his dream). He said in his heart (to himself), "Oh it is well that (it will be better if) I assemble these people who are here." Then (he said to them), "Let us go. My heart is not very grieved. (But) I do want very much to get my child." So then when he had gotten together all of those people, now they all arrived, they went on, they all got to the water, and then they built a fire there. Now he ordered off small chicken hawk, and big chicken hawk. He told them, "Later when I get my child, you are to take her up above." And they said, "Done" (all right!). Now all the people were at the water. Then panther sang, he said, "Coyote's wife! Take me across!" He said (again), "Coyote's wife! Take me across!" So now they sent mudfish. "Go! Fetch him! that one who wants to come across." So mudfish came to there. Now panther said, "I do not want you to take me across. I want coyote's wife to get me across." And now he began to sing again, he said, "Coyote's wife! get me across!" Now then coyote's wife was just about to give birth. So they brought the woman, and they put her into the boat, and the woman came. Now whale said to the mudfish, "Fetch a long pole." So mudfish went, he got a long pole, and he brought the pole inside. Now the old man (whale) said (to mudfish), "Burn the pole." So they burned the pole (to harden it). Now then the old man (whale) told coyote, "Climb up on top of the house. Fix (the place) where the (smoke ridge) hole of the house is." So coyote climbed up, and he fixed it where the house (smoke) hole was. Now he (whale) said to mudfish, "Kill that coyote. Stick it through him with the burning (hard pointed) pole." And indeed then mudfish pierced the coyote. The old man said, "It is well that we have killed him now. My child will be killed - coyote himself here is the cause of this." Now then she came close, and panther leaped into the boat. The woman was sort of leaning back (resting) as she sat there. Now that man (panther) split open her belly, and he took (out) his (panther) child, and he gave it to large chicken hawk, who took it up above. And he cut the (two braids of the) woman's hair, and he gave it to small chicken hawk. Now coyote's child (which he removed from her womb) he threw into the stream. Now the man leaped ashore. Then all the people went away.

Now the water (flood) came up (rose). And some of the people, the large birds carried them (up) on their backs. They took them to a big mountain (Pike's Peak or Marys Peak, west of Corvallis). All those people went to that big mountain there. Now the water was coming up higher. All the country was filled with water. Then skunk took an oak puff ball (i.e. an oak gall), and he made a hole in the oak puff ball, he got inside that. And to be sure that oak puff ball floated on top of the water. Now all the people were running along, they climbed up the big mountain. Now it was on that one very loftiest mountain, when all those people got (up) to there. And copperhead snake was carrying the fire as he swam. Now the water had pretty nearly got to the top of the mountain. Then those people said to panther, “What have you taken? This water does not want to go back (to recede).” And so he said, “I took nothing, I took only my child, and I took that woman’s hair.” “Oh,” the people said, “Throw away that hair of hers. Maybe it is that which is pursuing.” So panther told him, “Throw that hair into the water.” Sure enough small chicken hawk threw the hair into the water, and to be sure the water went down then, it went back (receded).

Now then the people said, “What shall we do now? There is no fire.” Then copperhead snake said, “I have put the fire here. That is what burned my mouth when I carried the fire.” Now the panther said, “I will buy that fire. I will give you one blanket. You may wear it all the time.” Copperhead snake said, “Let me see it.” So panther took a deer hide, it was extremely good, it was soft (pliant). Then copperhead snake said, “Oh I want it a little somewhat more stiff-dry.” So the man (panther) said, “Yes. I have one like that. Now I will fetch it.” And he went, he got it, and he brought it. Now that hide was somewhat dry. Then copperhead snake put it on. And now when he went along on the ground, to be sure it said (sounded) xa’xaxaxxx... (the noise made by a snake going along) as he went. “Oh,” said copperhead snake, “This covering of mine is extremely good. Take the fire. I give it to you.” Now when panther took the fire, then he built a fire, and he made a big blaze. And all those good (upper-class) people were warming themselves at the fire there. The people who were not very good (were not upper-class), they did not warm up. Now coyote was going there also (with those poorer people). And they were saying to one another, “What shall we do now? We cannot warm up. Let us look for pitchwood.” So they went, they looked for pitchwood, they found pitchwood, they took a lot of pitchwood, and they split it up. Now they said to one another, “We will use this pitchwood as our (dance) feathers (to be held in the hand), and then we will go, and we will stand up to our dance (we will dance). And then those people will watch us when we stand to our dance (we will dance). Now then when we all pass before the fire, we will poke at the earth with this pitchwood of ours, and when this pitchwood catches on fire, we will all run. Some of it will burn, we will build a fire there. And when we do run like that, then we will have a lot of fire.” Now sure enough they stood to their dance (they danced), they kept up the dance. And the good (upper-class) people watched on at them as they stood at their dance (as they danced). And those that had the pitchwood passed by (up and down the dance floor) in front (of the fire), and now then they poked at the fire with the pitchwood (“feathers” or dance wands). And the pitchwood caught on fire, and then when they (the lower-class people) ran, the (upper-class) people wanted to catch them to take the fire away from them. Some of them went by here (in this one direction), they ran on in every direction. When they saw a dried stump, they built a fire in it there, and it burned to be sure (because it retains fire a long time). Now those poor (lower-class) people had their fire.

Now I have told you about the copperhead snake who took the fire. It was that that burned his mouth, long long ago when he had the fire, when it burned his mouth. That is how people used to relate it long ago in that myth of theirs.

Appendix I.
Tampico Song

This song is said to have been written by a Tampico school teacher, Frank McDonough, in 1858. It was sung, nearly verbatim, in Soap Creek Valley at the time of Oregon statehood, immediately preceding the Civil War. McDonough, an Irish immigrant, was the second teacher at Tampico School, following Lycurgus Vineyard; namesake of Vineyard Mountain (see Map 2; Table 2) and first Superintendent of Schools for Benton County (McDonald 1983). McDonough was found cremated in his cabin on a nearby land claim— thought to have been murdered by several local residents—and this incident is believed to have had a bearing on Green Berry Smith's closure of the town in 1860. It is not known whether the song was used after the dissolution of Tampico, but it has existed in written form since that time (Phinney 1936; Davis & Davis 1978; Jackson 1980; Zybach & Meranda 1989). One interesting note is that the number of verses, and specific words in those verses, vary from source to source, making it seem likely that current versions were written from people's memories, probably between the 1880s and 1930s. For example, some versions have "Citadel of Tampico" in verse four, while others have "city dell of Tampico," instead. There doesn't seem to be a description or sheet music for the tune, but its form fits nicely with much of the Irish (and American) folk music of McDonough's era; a time when group singing and dancing was popular. A local blacksmith and pioneer landowner, Jacob Modie (see Map 11; Table D.2), is said to have taught singing (see verse nine) and held debates at the schoolhouse when school was not in session.

It was noted during the course of this research that older individuals (pre WW II residents) often pronounced local names differently than current residents. Very few interviewees and local consultants over 50 years of age said "creek" for the names of local streams, for example, they generally said "crick," instead. Similarly, Writsmans Hill is pronounced "RITES-mun" by people that knew the Writsman family in the early 1900s (Rohner 1993), but it is usually pronounced "RITZ-mun," by local residents today; and Tampico ("tam-PUH-ko") has come to be pronounced "TAM-peek-ko" by the same process (Zybach & Meranda 1989). In other words, Tampico really does rhyme with "calico," as in the Tampico Song, so long as the words are pronounced in the same manner as early residents. This song can be compared with other oral traditions (see Chapter II; Appendix H) for its various historical values.

Chorus:

Hurrah, hurrah for Tampico,
Three cheers for our town Tampico.
Corvallis ne'er can take the shine;
To it we never will resign.

Oregon is a pleasant place
for dancing, fun and frolic-oh
But if you search it o'er and o'er
you'll find no place like Tampico

(Chorus)

You wonder how it got its name,
it happened about two years ago;
A rambling scamp from Arkansaw [sic],
for mischief called it Tampico.

(Chorus)

And now the name sticks to the place;
perhaps 'twill long continue so.
Later, perhaps some degenerate race,
will drop the name of Tampico.

(Chorus)

Our town is not extensive yet,
being but two houses in a row;
And opposite on the other street
is the Citadel of Tampico

(Chorus)

Crouch's goods are there for sale,
silk, pantaloons, and calico;
And there just twice a week the mail
deposits freight in Tampico.

(Chorus)

Saturday night the boys all meet
and all the bands are sure to go;
To make amendments for the week
with a social spree in Tampico.

(Chorus)

Egg-nog first circulates around,
and then the fiddle and the bow;
Off go the coats to the merry sound,
and a hoe-down starts in Tampico.

(Chorus)

Now they shake the toe and heel,
and nimbly they go to and fro;
All care's resting until they dance
and shout hurrah for Tampico.

(Chorus)

But singing school is now the rage,
there all the boys are sure to go;
From North to South and all around,
the neighborhood of Tampico.

(Chorus)

One man swore he was a whale,
and all believed that it was so;
Then all the small craft took in sail,
and scampered in to Tampico.

(Chorus)