Cultural Resource Overview of the BLM Salem District, Northwestern Oregon:
Archæology
Ethnography
History

Rick Minor
Stephen Dow Beckham
Phyllis E. Lancefield-Steeves
Kathryn Anne Toepel

UNIVERSITY OF OREGON ANTHROPOLOGICAL PAPERS NO. 20 1980
CULTURAL RESOURCE OVERVIEW
OF BLM LANDS IN NORTHWESTERN OREGON:
ARCHAEOLOGY, ETHNOGRAPHY, HISTORY

BY
RICK MINOR
STEPHEN DOW BECKHAM
PHYLLIS E. LANCEFIELD-STEEVES
KATHRYN ANNE TOEPEL

WITH A CONTRIBUTION BY
L.R. STEEVES

C. Melvin Aikens, Editor

UNIVERSITY OF OREGON ANTHROPOLOGICAL PAPERS NO. 20
1980
ABSTRACT

This document represents a Cultural Resource Overview for the Bureau of Land Management's Salem District in northwestern Oregon. Its primary purpose is to provide a framework for the interpretation of cultural resources found in the district, and to serve as a guide for the evaluation of their scientific and community significance. The document is composed of several parts.

An environmental overview provides background information on the setting in which the cultural developments in prehistoric and historic times have taken place. Included are brief sections describing the geology and physiography, climate, pedology, flora and fauna resources of northwestern Oregon.

An archaeological overview summarizes prehistoric cultural developments in northwestern Oregon. Archaeological evidence indicates that prehistoric populations practiced lifeways that were closely adapted to the resources of the natural environment and were inhabiting the region at least as early as 10,000 years ago.

An ethnographic overview presents a summary of the information available on the aboriginal peoples who inhabited northwestern Oregon at the beginning of the historic era. Included are sections describing the cultures of the Kalapuya, Molala, Atsena/Yaquina, Tillamook, Chinook, and Clatskanie peoples.

An historical overview summarizes the events and activities that have taken place in northwestern Oregon since the arrival of Euro-Americans in the eighteenth and nineteenth centuries. The course of history in this region followed many of the familiar patterns observed elsewhere in the American West, notably in the important role played by the federal government and the emergence of transportation systems in shaping the development of northwestern Oregon.

The text of this document concludes with a synthesis of the information available on the human occupation and use of northwestern Oregon, suggestions for future cultural resource related research, and recommendations for the management of the cultural resources found in the region. An extensive bibliography of the sources used in the preparation of this overview is appended.
This document represents the more general portion of a Class I Cultural Resources Existing Data Inventory for the Bureau of Land Management's Salem District. Preparation of this document was carried out under the terms of Contract No. YA-512-CT9-136 between the United States Department of the Interior, Bureau of Land Management, and the Department of Anthropology, University of Oregon. Dr. C. Melvin Aiken, Professor of Anthropology, University of Oregon, served as Principal Investigator for this project. Gary Stump, Salem District Archaeologist, served as the Contracting Officer's Authorized Representative during this project, and reviewed earlier drafts of this document.

The historical overview of northwestern Oregon—the region in which the Salem District is situated—was prepared by Dr. Stephen Dow Beckham, Associate Professor of History, Lewis and Clark College. The ethnographic overview of the region's aboriginal inhabitants was written by Phyllis E. Lancefield-Steeves, a graduate student in the Department of Anthropology, University of Oregon. The archaeological overview of northwestern Oregon was written by Rick Minor, a doctoral student in the Department of Anthropology, University of Oregon. The section of this document proposing recommendations for the future management of cultural resources within the Salem District was prepared by Kathryn Anne Toepel, also a doctoral student in the Department of Anthropology, University of Oregon. Finally, L.R. Steeves, a graduate student in Interdisciplinary Studies at the University of Oregon, contributed the environmental overview for this study.

The authors would like to express their appreciation to the individuals listed below who graciously gave of their time and knowledge during the preparation of this document:

Homer G. Barnett
Professor Emeritus
Department of Anthropology
University of Oregon

Elizabeth Walton Potter
Historic Preservation Specialist
State Historic Preservation Office

Luther S. Cressman
Professor Emeritus
Department of Anthropology
University of Oregon

Richard Ross
Associate Professor of Anthropology
Oregon State University

Paul Ewing
Oregon Historical Society

Becky Saleeby
Department of Anthropology
University of Oregon

Arthur Kraiman
Eugene Indian Center

William F. Willingham
Department of History
Lewis and Clark College

Henry Zenk
Department of Anthropology
University of Oregon

The permission of Edward G. Stauber, District Manager of the BLM Salem District, to publish this document is gratefully acknowledged. The authors also thank Allen B. Cox, who drafted the illustrations used in the text.

# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td>Preface and Acknowledgements</td>
<td>iv</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>viii</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>The Area</td>
<td>1</td>
</tr>
<tr>
<td>The Area in Previous Research</td>
<td>3</td>
</tr>
<tr>
<td>Research Sources: Museums and Libraries</td>
<td>6</td>
</tr>
<tr>
<td>Environmental Overview</td>
<td>10</td>
</tr>
<tr>
<td>Geology and Physiography</td>
<td>10</td>
</tr>
<tr>
<td>Climate</td>
<td>11</td>
</tr>
<tr>
<td>Pedology</td>
<td>12</td>
</tr>
<tr>
<td>Floral Resources</td>
<td>13</td>
</tr>
<tr>
<td>Faunal Resources</td>
<td>16</td>
</tr>
<tr>
<td>Conclusion</td>
<td>19</td>
</tr>
<tr>
<td>Archaeological Overview</td>
<td>20</td>
</tr>
<tr>
<td>Paleoclimatic Considerations</td>
<td>21</td>
</tr>
<tr>
<td>Lower Columbia Valley Prehistory</td>
<td>23</td>
</tr>
<tr>
<td>History of Archaeological Research</td>
<td>23</td>
</tr>
<tr>
<td>Cultural Sequence at The Dalles</td>
<td>24</td>
</tr>
<tr>
<td>Cultural Sequence in the Portland Basin</td>
<td>25</td>
</tr>
<tr>
<td>Willamette Valley Prehistory</td>
<td>28</td>
</tr>
<tr>
<td>History of Archaeological Research</td>
<td>28</td>
</tr>
<tr>
<td>The Upper Willamette Valley Chronology</td>
<td>31</td>
</tr>
<tr>
<td>The Upper Willamette Valley Subsistence-Settlement System</td>
<td>36</td>
</tr>
<tr>
<td>Archaeology of the Northern Valley Cascade Range</td>
<td>38</td>
</tr>
<tr>
<td>Northern Oregon Coastal Prehistory</td>
<td>40</td>
</tr>
<tr>
<td>Summary</td>
<td>43</td>
</tr>
<tr>
<td>Ethnographic Overview</td>
<td>45</td>
</tr>
<tr>
<td>Linguistic Identity and Distribution</td>
<td>45</td>
</tr>
<tr>
<td>The Cultural Area</td>
<td>49</td>
</tr>
<tr>
<td>Sources and Their Historical Context</td>
<td>49</td>
</tr>
<tr>
<td>Historic Resources</td>
<td>49</td>
</tr>
<tr>
<td>Ethnographic Studies</td>
<td>50</td>
</tr>
<tr>
<td>Problems Regarding Indian Identity</td>
<td>51</td>
</tr>
<tr>
<td>Kalapuya</td>
<td>51</td>
</tr>
<tr>
<td>Settlement Patterns</td>
<td>52</td>
</tr>
<tr>
<td>Tualatin</td>
<td>52</td>
</tr>
<tr>
<td>Yamhill</td>
<td>53</td>
</tr>
<tr>
<td>Pudding River</td>
<td>54</td>
</tr>
<tr>
<td>Santiam</td>
<td>54</td>
</tr>
<tr>
<td>Luckiamute</td>
<td>55</td>
</tr>
<tr>
<td>Mary's River</td>
<td>55</td>
</tr>
<tr>
<td>Additional Divisions</td>
<td>56</td>
</tr>
<tr>
<td>Subsistence</td>
<td>59</td>
</tr>
<tr>
<td>Technology</td>
<td>56</td>
</tr>
<tr>
<td>Structures</td>
<td>59</td>
</tr>
<tr>
<td>Clothing and Adornment</td>
<td>60</td>
</tr>
<tr>
<td>Socio-political Organization</td>
<td>60</td>
</tr>
<tr>
<td>Political Alliances</td>
<td>61</td>
</tr>
<tr>
<td>Religious Beliefs</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>62</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Molala</td>
<td>63</td>
</tr>
<tr>
<td>Settlements</td>
<td>64</td>
</tr>
<tr>
<td>Ethnographic Lifeways</td>
<td>64</td>
</tr>
<tr>
<td>The Fate of the Molala</td>
<td>65</td>
</tr>
<tr>
<td>Alsea/Yaquina</td>
<td>65</td>
</tr>
<tr>
<td>Settlement Patterns</td>
<td>66</td>
</tr>
<tr>
<td>Alsea</td>
<td>66</td>
</tr>
<tr>
<td>Yaquina</td>
<td>67</td>
</tr>
<tr>
<td>Subsistence</td>
<td>67</td>
</tr>
<tr>
<td>First Food Rites and Taboos</td>
<td>68</td>
</tr>
<tr>
<td>Technology</td>
<td>68</td>
</tr>
<tr>
<td>Structures</td>
<td>69</td>
</tr>
<tr>
<td>Material Culture</td>
<td>69</td>
</tr>
<tr>
<td>Socio-political Organization</td>
<td>70</td>
</tr>
<tr>
<td>Religious Beliefs</td>
<td>70</td>
</tr>
<tr>
<td>Tillamook</td>
<td>71</td>
</tr>
<tr>
<td>Settlement Patterns</td>
<td>72</td>
</tr>
<tr>
<td>Nehalem</td>
<td>72</td>
</tr>
<tr>
<td>Tillamook</td>
<td>73</td>
</tr>
<tr>
<td>Nestucca</td>
<td>73</td>
</tr>
<tr>
<td>Salmon River</td>
<td>74</td>
</tr>
<tr>
<td>Siletz</td>
<td>74</td>
</tr>
<tr>
<td>Subsistence</td>
<td>74</td>
</tr>
<tr>
<td>Technology</td>
<td>75</td>
</tr>
<tr>
<td>Material Culture</td>
<td>76</td>
</tr>
<tr>
<td>Clothing and Adornment</td>
<td>76</td>
</tr>
<tr>
<td>Socio-political Organization</td>
<td>77</td>
</tr>
<tr>
<td>Political Alliances</td>
<td>77</td>
</tr>
<tr>
<td>Religious Beliefs</td>
<td>77</td>
</tr>
<tr>
<td>Art</td>
<td>78</td>
</tr>
<tr>
<td>Chinook</td>
<td>78</td>
</tr>
<tr>
<td>Settlement Patterns</td>
<td>78</td>
</tr>
<tr>
<td>Clatsop</td>
<td>79</td>
</tr>
<tr>
<td>Cathlamant</td>
<td>79</td>
</tr>
<tr>
<td>Skilloot</td>
<td>80</td>
</tr>
<tr>
<td>Multnomah</td>
<td>80</td>
</tr>
<tr>
<td>Clatscan</td>
<td>81</td>
</tr>
<tr>
<td>Clackamas</td>
<td>82</td>
</tr>
<tr>
<td>Cascades</td>
<td>82</td>
</tr>
<tr>
<td>Additional Divisions</td>
<td>82</td>
</tr>
<tr>
<td>Subsistence</td>
<td>83</td>
</tr>
<tr>
<td>Technology</td>
<td>84</td>
</tr>
<tr>
<td>Material Culture</td>
<td>85</td>
</tr>
<tr>
<td>Social Organization</td>
<td>86</td>
</tr>
<tr>
<td>Religious Beliefs</td>
<td>87</td>
</tr>
<tr>
<td>Clatskanie</td>
<td>88</td>
</tr>
<tr>
<td>Cultural Identity and Distribution</td>
<td>88</td>
</tr>
<tr>
<td>Ethnographic Lifeways</td>
<td>89</td>
</tr>
<tr>
<td>Disease</td>
<td>90</td>
</tr>
<tr>
<td>Reservation Status</td>
<td>90</td>
</tr>
<tr>
<td>Summary</td>
<td>91</td>
</tr>
<tr>
<td>HISTORICAL OVERVIEW</td>
<td></td>
</tr>
<tr>
<td>Exploration</td>
<td>93</td>
</tr>
<tr>
<td>Indian-White Relations</td>
<td>100</td>
</tr>
<tr>
<td>Nineteenth Century Settlements</td>
<td>107</td>
</tr>
<tr>
<td>Motivations</td>
<td>107</td>
</tr>
<tr>
<td>French Prairie</td>
<td>110</td>
</tr>
<tr>
<td>Population Profile in 1850</td>
<td>111</td>
</tr>
<tr>
<td>Settlement Patterns by 1870</td>
<td>112</td>
</tr>
<tr>
<td>Columbia Planning Unit</td>
<td>113</td>
</tr>
<tr>
<td>Nestucca Planning Unit</td>
<td>114</td>
</tr>
<tr>
<td>Willamena Planning Unit</td>
<td>115</td>
</tr>
<tr>
<td>Rickreall Planning Unit</td>
<td>116</td>
</tr>
<tr>
<td>Alsea Planning Unit</td>
<td>117</td>
</tr>
<tr>
<td>Clackamas Planning Unit</td>
<td>117</td>
</tr>
<tr>
<td>Santiam Planning Unit</td>
<td>118</td>
</tr>
<tr>
<td>Population Trends</td>
<td>119</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (continued)

Economic Patterns ........................................... 122
Subsistence Living ........................................... 122
Agriculture .................................................. 124
Logging and Lumbering ..................................... 128
Mining ....................................................... 135
Tourism ....................................................... 136
Transportation ............................................... 137
Federal Government Actions ............................... 140
Exploration and Survey ................................... 140
Military Posts ............................................... 141
Aids to Transportation and Commerce .................. 141
Land Policies .................................................. 142
Revestment of Oregon and California Railroad Grant Lands 143
Summary ....................................................... 144

CULTURAL RESOURCE SYNTHESIS .......................... 145

FUTURE RESEARCH DIRECTIONS ............................ 150
Archaeology ................................................. 150
Ethnography ............................................... 152
History ....................................................... 155

FUTURE MANAGEMENT OPTIONS ............................ 157

BIBLIOGRAPHY .............................................. 165
Introduction ............................................... 165
Environment ................................................. 166
Archaeology ................................................. 168
Ethnography ................................................. 176
History ....................................................... 186
Exploration ............................................... 186
Indian-White Relations .................................. 187
Nineteenth Century Settlements ......................... 188
Economic Patterns ......................................... 191
Federal Government Actions ............................... 193
Future Research Directions ............................... 195
Future Management Options ............................... 197

LIST OF FIGURES

Figure
1 Location of the Bureau of Land Management’s Salem District in Northwestern Oregon . 2
2 Location of Major Archaeological Sites in Northwestern Oregon . 22
3 Artifacts Characteristic of the Merrybell Phase on the Lower Columbia River . 27
4 Artifacts Characteristic of the Multnomah Phase on the Lower Columbia River . 29
5 The Prehistoric Upper Willamette Valley Subsistence-Settlement System . 37
6 Distribution of Indian Groups in Northwestern Oregon circa 1850 . 46
7 Many homesteaders moved into the Nestucca watershed of southern Tillamook County in the 1870’s and the 1880’s . 95
8 Hop-picking attracted extensive seasonal labor in the years 1880-1930 . 120
9 Many farmers erected hop barns on their properties . 121
10 The loggers of the Bridal Veil Lumber Company resided in the small logging camp of Palmer in the Columbia Gorge in the 1880’s and 1890’s . 130
11 The Bridal Veil Lumber Company in the 1880’s began extensive use of locomotives and flumes for transporting logs from the slopes of the Cascades to the banks of the Columbia River . 131
12 Prune dryers enabled farmers to process their crops and ship them more easily to market . 139
13 The early locomotives of the Oregon and California Railroad provided the first steam power for hauling major cargoes by land through the Willamette Valley . 139
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BLM Land Holdings by County in Northwestern Oregon</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Major Archaeological Sites and Projects by Subregion in Northwestern Oregon</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Cultural Sequence at The Dalles</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>Cultural Sequence in the Portland Basin</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>Archaeological Traits Associated with Chronological Periods in the Upper Willamette Valley</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td>Classification of Oregon Indian Languages</td>
<td>47</td>
</tr>
<tr>
<td>7</td>
<td>Tualatin Subsistence Activities by Season</td>
<td>59</td>
</tr>
<tr>
<td>8</td>
<td>Population Trends in Northwestern Oregon</td>
<td>119</td>
</tr>
<tr>
<td>9</td>
<td>Percent of Population Increase</td>
<td>122</td>
</tr>
<tr>
<td>10</td>
<td>Livestock Totals in 1850</td>
<td>125</td>
</tr>
<tr>
<td>11</td>
<td>Crop Production in 1850</td>
<td>125</td>
</tr>
<tr>
<td>12</td>
<td>Farm Property Trends, 1900-1920</td>
<td>126</td>
</tr>
<tr>
<td>13</td>
<td>Selected Items from State Census, 1865-1895</td>
<td>127</td>
</tr>
<tr>
<td>14</td>
<td>Salem BLM District Sawmills and Production, 1902</td>
<td>129</td>
</tr>
<tr>
<td>15</td>
<td>Salem BLM District Sawmills and Production, 1908</td>
<td>132</td>
</tr>
<tr>
<td>16</td>
<td>Salem BLM District Sawmills and Production, 1910</td>
<td>133</td>
</tr>
<tr>
<td>17</td>
<td>Salem BLM District Sawmills and Production, 1914</td>
<td>134</td>
</tr>
<tr>
<td>18</td>
<td>Salem BLM District Sawmills and Production, 1918</td>
<td>135</td>
</tr>
<tr>
<td>19</td>
<td>Major Logging Railroads in the Salem BLM District</td>
<td>138</td>
</tr>
</tbody>
</table>
INTRODUCTION

This volume presents a descriptive overview of the cultural resources of the Bureau of Land Management's holdings in northwestern Oregon. Cultural resources are those fragile and non-renewable remains of human activity, occupation, and endeavor as reflected in sites, districts, structures, artifacts, objects, ruins, works of art, architecture, and natural features that were of importance in human events, both historic and prehistoric. The value of cultural resources lies in their potential for providing information about former ways of life and in their historical significance to the community in which they now exist.

The Bureau of Land Management is required by federal law to identify and evaluate cultural resources on public lands under its jurisdiction, and to insure that Bureau-initiated or Bureau-authorized actions do not inadvertently harm or destroy cultural resources. These requirements are mandated by the Antiquities Act of 1906, the National Historic Preservation Act of 1966 as amended, the National Environmental Policy Act of 1969 (NEPA), and Executive Order 11593 (1971). The present cultural resource overview represents a major step by the Bureau of Land Management to implement these directives in northwestern Oregon.

As specified in the agreement under which this project was conducted, the research reported in this cultural resource overview consisted primarily of a search of existing documentary and archival records. Preparation of this overview is intended to meet the following objectives:

1. To provide guidance for the interpretation of cultural resources found during on-the-ground surveys within the northwestern Oregon region;
2. To provide a framework to assist in assessing the significance of cultural resources found within the area;
3. To serve as a source of background data necessary for Environmental Assessment Reports, Environmental Statements, Unit Resource Analysis (URA), Management Framework Plans (MFP), and other government project documents;
4. To acquaint Bureau of Land Management employees with the presence and importance of cultural resources found in northwestern Oregon; and
5. To help inform the general public about the cultural heritage of northwestern Oregon and to foster a sense of respect and care for significant cultural resources.

Much of this volume addresses the past settlement and use of the lands administered by the Bureau of Land Management in northwestern Oregon and includes sections describing the area's environment, aboriginal inhabitants, prehistory, and history. A companion inventory volume of limited distribution, prepared for administrative use, provides more detailed information on specific cultural resources identified within northwestern Oregon. Concluding sections of this overview make general recommendations regarding future research directions and future management of the cultural resources located on BLM land in northwestern Oregon. A comprehensive bibliography of sources consulted during the preparation of this document constitutes the final portion of the overview, and should prove useful to those who wish to pursue various topics discussed below.

THE AREA

This overview reviews the known cultural resources for approximately 12,000 square miles of public and private lands in northwestern Oregon. The study area consists of the Bureau of Land Management Salem District, which is divided into five resource areas and seven planning units by the Bureau for management purposes as shown in Figure 1. They are listed as follows:

Tillamook Resource Area  Columbia Planning Unit
Nestucca Planning Unit

Yamhill Resource Area  Willamina Planning Unit
Rickreall Planning Unit

Alsea Resource Area  Alsea Planning Unit

Santiam Resource Area  Santiam Planning Unit

Clackamas Resource Area  Clackamas Planning Unit

Figure 1. Location of the Bureau of Land Management's Salem District in Northwestern Oregon.
These divisions include all or part of thirteen counties. Table 1 provides an indication of Bureau holdings within each county in the study area. The final column of this table reveals that only a small proportion of the lands in northwestern Oregon are under the management protection of the Bureau of Land Management. It is estimated that only 630 square miles, or less than 5.2% of the study area, have been allocated to the Bureau in this region. In addition, Bureau holdings in the Salem District comprise only 2.6% of all Bureau of Land Management lands in the State of Oregon.

<table>
<thead>
<tr>
<th>County</th>
<th>BLM-Managed Acreage</th>
<th>BLM Lands (Square Miles)</th>
<th>% BLM-Managed Lands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>57,390</td>
<td>90</td>
<td>13.4</td>
</tr>
<tr>
<td>Clackamas</td>
<td>62,906</td>
<td>98</td>
<td>5.2</td>
</tr>
<tr>
<td>Clatsop</td>
<td>43</td>
<td>.07</td>
<td>.01</td>
</tr>
<tr>
<td>Columbia</td>
<td>11,085</td>
<td>17</td>
<td>2.7</td>
</tr>
<tr>
<td>Lane</td>
<td>290,052</td>
<td>453</td>
<td>9.9^2</td>
</tr>
<tr>
<td>Linn</td>
<td>23,993</td>
<td>37</td>
<td>3.8</td>
</tr>
<tr>
<td>Linn</td>
<td>88,198</td>
<td>138</td>
<td>6.0^3</td>
</tr>
<tr>
<td>Marion</td>
<td>20,534</td>
<td>33</td>
<td>2.8</td>
</tr>
<tr>
<td>Multnomah</td>
<td>5,880</td>
<td>9</td>
<td>2.2</td>
</tr>
<tr>
<td>Polk</td>
<td>40,996</td>
<td>64</td>
<td>8.7</td>
</tr>
<tr>
<td>Tillamook</td>
<td>48,625</td>
<td>76</td>
<td>6.8</td>
</tr>
<tr>
<td>Washington</td>
<td>12,335</td>
<td>19</td>
<td>2.7</td>
</tr>
<tr>
<td>Yamhill</td>
<td>39,408</td>
<td>62</td>
<td>8.7</td>
</tr>
</tbody>
</table>


^2 Virtually all of Lane County falls within the BLM Eugene District which is not covered by this study.

^3 Approximately one-fourth of Linn County is covered by the BLM's Eugene District and is not included in the present study area.

THE AREA IN PREVIOUS RESEARCH

As will be discussed in the archaeology section of this Cultural Resource Overview, a considerable amount of archaeological research has been conducted in northwestern Oregon. This situation is due, at least in part, to the fact that Oregon's three major public universities are all located within this region. The impetus behind the activities of archaeologists in northwestern Oregon comes from a variety of sources.

In the earlier years, especially, "pure" research, either self-funded or supported by institutional grants, by university-based archaeologists accounted for most of the archaeological studies in this region. Examples of such projects include the pioneering work of Luther S. Cressman (1947; Cressman and Laughlin 1941), William S. Laughlin (1941, 1943), and Lloyd S. Collins (1951) in the Willamette Valley. Although becoming less prevalent, this type of research has continued up to the present, and is exemplified by the doctoral dissertation fieldwork of Neuman (1959) on the northern Oregon coast, Woodward (1974) in the Clackamas River drainage, White (1974) in the Upper Willamette Valley, and the ongoing program of study along the Oregon coast by archaeologists from Oregon State University under the direction of Ross (1975; Ross and Snyder 1979; also see Rambo 1978).

Beginning shortly after World War II, however, the direction of archaeological research in northwestern Oregon, as elsewhere in the United States, began to change. At that time, a large number of major dam and reservoir construction projects got under way. Under the requirements of the Historic Sites Act of 1935 and later the Reservoir Salvage Act of 1960, archaeological studies intended to salvage cultural remains from destruction as a result of these construction projects were implemented first by the Smithsonian Institution River Basin Surveys program and later under the administration of the National Park Service. Examples of such studies in northwestern Oregon include a survey of twelve proposed reservoir sites in the Willamette Valley (Shiner 1949), and archaeological survey and testing.
projects in advance of the construction of the proposed Scoggins Creek Reservoir (Cole and Rice 1965; Davis 1970) and Gaston Reservoir (Beckham 1975; Decker and Davis 1976).

In more recent years, however, with the passage of additional federal legislation—most notably the Historic Preservation Act of 1966 and the National Environmental Policy Act of 1969—the direction of archaeological research has again changed. At the present time, the most common form of archaeological research is the relatively small-scale clearance survey conducted in advance of highway, sewer, building and other types of ground-disturbing construction activities. Indeed, almost twice as many of these small-scale clearance surveys have been conducted in northwestern Oregon than all other types of archaeological research combined. (See the Cultural Resource Research and Investigation Project Summaries included within the Existing Site Data Compilation accompanying this volume.) The vast majority of these studies have involved construction projects on private, municipal, county or state property. In compliance with federal legislation regarding the protection of cultural resources, the Bureau of Land Management maintains an ongoing program for the inventorying of prehistoric and historic resources on federal lands under its jurisdiction.

In contrast to the relatively great amount of archaeological research done in northwestern Oregon by local institutions, few ethnographic studies have been done by local anthropologists. Most of the major research projects undertaken in this area have been funded by institutions or individuals based outside the region, such as the Bureau of American Ethnology and Columbia University. With the exception of materials collected in the early 1840s by Horatio Hale, philologist with the Wilkes Expedition, all professional anthropological research post-dates the removal of local Indians from their homelands to reservations, and thus represents, to some extent, transitional cultures. By far the greater number of these studies were primarily focused on linguistic information and mythology texts. Some northwestern Indian groups, especially the Clatsop and some divisions of the Tullamook, received little attention from ethnographers until memories of their aboriginal cultural lifeways or the people themselves had passed. What is known about these cultures is drawn primarily from early historic sketches or inferred from neighboring groups who shared similar environmental areas.

The following brief review of field work among northwestern Oregon Indians is drawn largely from the Annual Reports of the Bureau of American Ethnology and the Proceedings of the American Anthropological Association. Included are the major ethnographers who worked directly with native informants, the year(s) of their field work, their professional affiliation at the time, and the Indian groups to which they directed their inquiry. Individual manuscripts and published reports which resulted from field data will be discussed further in the ethnographic section of this Cultural Resource Overview.

In 1841, Horatio Hale (Wilkes Expedition) traveled widely among the northwestern Indians; his report provides linguistic, descriptive, and locational information prior to the reservation period, but about ten years after the malarial epidemic had drastically reduced the native population in the Lower Columbia and Willamette valleys and altered aboriginal cultural patterns.

In 1877, Albert S. Gatschet and George Gibbs (United States Geographical and Geological Survey of the Rocky Mountain Region) visited western Oregon Indians and collected linguistic and ethnographic information. During the same year, Gatschet was employed by the Bureau of Indian Affairs to collect statistical data regarding the Oregon and Washington Territory Indians.

In 1884, the Reverend J. Owen Dorsey was sent by the Director of the Bureau of Ethnology to the Siletz Reservation. Dorsey collected linguistic and settlement information from Alsea and Yaquina informants, among other groups living on the reservation outside the Salem District. Dorsey collected about 60 plant specimens during this time also, and native terms for each.

In the 1890s, Franz Boas (Columbia University) visited with Lower Chinook informants and collected material for his Cathlamet texts for the Bureau of American Ethnology.

In 1900, Livingston Farrand (Columbia University/Villard Expedition) worked with the Alsea and others at the Siletz Reservation.

In 1903, H. H. St. Clair (assistant to Dr. Boas) began work among the Alsea. During the winter months he worked with Boas on the Chinook dictionary. Boas continued his investigation in Chinook grammar.

In 1909, through 1916, Leo J. Frachtenberg collected information on the Alsea, Molalla, and Kalapuya at the Siletz and Grand Ronde reservations, the Yakima Reservation, the Chumash training school, and in Portland. He spent a considerable amount of time
in the field, revising earlier materials collected by Oatschuet and Farrand, and collecting additional linguistic and ethnographic information. A subsequent grant by Mrs. Villard and Homer Sargent allowed continuation of his field work.

During the 1930s, linguistic studies continued in the northwest, spurred in part by the Council of Learned Societies Committee on Research in American Indian Languages which had funds available for interviewing the dwindling number of surviving native speakers. Melville Jacobs (University of Washington) was actively involved in linguistic fieldwork throughout the decade and following; during this time he collected field data and made phonographic records of the Clackamas Chinook, Tualatin/Santiam/Yacoma Kalapuya, Alsea, Molala, and Chinook Jargon. At least 20 additional trained linguists volunteered their service in the region during this decade, including many who undertook linguistic work with the Nehalem and Garibaldi Tillamook, and Jaime de Angulo and L. S. Freeland who worked with Kalapuya informants (Jacobs 1941). In 1931 and at intervening periods through 1936, Verne Ray (University of Washington) interviewed two of the last Lower Chinookan speakers (Ray 1938). Homer Barnett and Philip Drucker, both graduate students under A. L. Kroeber at the University of California, Berkeley, spent the summer of 1934 on the Siletz Reservation, collecting information for Barnett's cultural element distribution list and Drucker's Alsea texts (Barnett, personal communication). Bess Langdon completed an ethnography of the Garibaldi Tillamook during this decade (Jacobs 1941).

In 1953, Robert Suphan and Herbert Taylor, Jr. individually interviewed native informants in northwestern Oregon and southwestern Washington regarding aboriginal land utilization by Indians formerly living in the Lower Columbia Valley and northern coast for their reports to the Native Claims Commission. None of their informants were alive before the reservation period (Suphan 1974:193).

Field work since the 1950s appears to have been largely confined to linguistic studies with the few remaining native speakers and with the examination of native crafts manufacture, such as by Yvonne Hajda and Leone Kasner.

The lands of the Salem BLN District have been but inexactily treated in the historical literature of western Oregon. The first era of historical studies was focused primarily upon the biographies of the early generation of white settlers. These biased and self-serving accounts, while lacking in accuracy and objectivity, nevertheless have preserved valuable biographical information otherwise unavailable. This type of writing continued well into the 1920s with the works of Charles Carey, Robert Carlton Clark, and Joseph Gaston. While these three writers each produced descriptive histories in addition to the biographical volumes in their sets, they did not discuss much of the social, ethnic, or common person's economic experiences in the region. Their works were largely focused upon the deeds of the elite; the misdeeds of that class were ignored.

Since the 1920s the majority of historical works assessing the human experiences in this region have been prepared by untrained historians who have felt a "calling" to write reminiscences, recollections, or their peculiar versions of events. Too often these accounts, published by the county historical societies, have failed to place the events of the narrative in the larger context of state, regional, or national history. The great majority of these works have appeared in a vacuum and, in a sense, are somewhat vacuous themselves. The Oregon Historical Quarterly since 1952 has tended to publish primary accounts in lieu of interpretive, secondary works. The result is that a wide amount of unanalyzed data has found its way into print but virtually no studies have produced a balanced, scholarly synthesis of these narratives.

Part of the physical environment of the historic period has, however, received recent attention. In 1974 the Oregon Historical Society published the impressive two volume study Space, Style, and Structure: Building in Northwest America. A number of the structures identified as prototypes of styles and trends in the region's architecture come from the upper Willamette Valley and its surrounding hillsides. Further, in 1976 Stephen Dow Beckham carried out the project which resulted in the Statewide Inventory of Historical Sites and Buildings. Although concentrating on urban settings for the bulk of the inventory, this study was focused upon a county-by-county identification of cultural resources. It has, in a sense, become a foundation upon which new inventories have been and are being developed. Some communities such as Albany and McMinnville have in 1979 and 1980 carried out comprehensive inventories to assess their historical resources. These projects are comparable to the compliance of the various federal agencies with the mandates for cultural resource management on public lands.

The popular press has identified over the years a considerable number of sites and events of relevance to the understanding of the human experience in the Salem BLN District in the historic period. The late Ben Maxwell of Salem for many years wrote articles in the Capital Journal about places which he had researched in the mid-Willamette Valley. The
subject indexes to the four major papers of the upper Willamette Valley—the Oregon Index—are good places to begin for more intensive inventory development and site assessments. Although a number of these locations will need verification and documentation of an order differing from the oral informants employed by most newspaper writers, the popular press publications are one place to begin.

Most of the topics covered in thesis and dissertation topics at institutions of higher education in Oregon have not related to the public lands of the Salem BLM District. Exceptions, of course, include some of the projects in geography and geology. Historians and archeologists have, however, concentrated until the late 1970s primarily upon valley floor sites rather than the hillsides and mountains held by the BLM.

RESEARCH SOURCES: MUSEUMS AND LIBRARIES

Specific documentation for the materials used in the research and writing of this cultural resource overview is contained in the citations in the document's separate sections and in the relevant sources cited in the bibliography. Listed below are some of the museums and libraries of particular relevance to the collection of information and artifacts relating to the prehistory, ethnography, and history of the Salem BLM District. These museums and libraries can be expected to be of use in future research and further documentation of the sources identified in this study.

Oregon Historical Society Museum and Library, 1230 S.W. Park Avenue, Portland, Oregon 97205. This is the largest regional museum in the state with extensive holdings of artifacts and objects relating to the prehistoric and historic periods. The library contains about 50,000 published volumes, 12,000 reels of microfilm, 5,700 microfiche, and almost 1,000,000 photographs. The library maintains extensive scrapbook and clippings files, holdings of cemetery records, genealogical materials, maps and charts, census files, and manuscripts.

University of Oregon Library, Eugene, Oregon. Founded in 1881, the library is the largest in the state with 1.5 million bound volumes and over one-half million items in microfilm. The library is especially strong in regional history holdings of almost all extant back issues of Oregon newspapers, thousands of manuscript items, and many rare books, broadsides, pamphlets, maps, and photographs which are housed in the Department of Special Collections. The library has published special finding aids for its manuscript collections and has listed many of its holdings in the National Union Catalog of Manuscripts. The library also holds extensive published materials on the region's prehistory, ethnology, linguistics, and thesis studies filed through the Department of Anthropology. The library is a full depository for state documents and has extensive federal documents holdings dating from the nineteenth century.

Oregon State Museum of Anthropology, Eugene, Oregon. The most important museum collections of archaeological materials from northwestern Oregon are those deposited in the Oregon State Museum of Anthropology, located at the University of Oregon in Eugene. The Museum of Anthropology is designated by Oregon state law as the state's official depository for antiquities, and all collections which have been made during archaeological projects conducted by major museums or educational institutions within Oregon, as well as some made by BLM employees, are presently housed there. In addition to the materials in the Museum of Anthropology, other museums at the University of Oregon—the Condon Museum of Geology and the University Herbarium—maintain collections in the fields of geology, vertebrate and invertebrate paleontology, malacology, mammalogy, ornithology, paleobotany, and palynology which are pertinent to the study area.

Oregon State Library, Summer and Court streets, Salem, Oregon. The State Library possesses an extensive collection of regional historical and folklore materials, including the unpublished files of the Oregon Folklore Project operated by the W.P.A. in the 1930s and the files of the Oregon Historical Records project of the same era. It has nearly 400,000 titles, extensive vertical files of clippings, and well-maintained card indexes to Oregon biography and history. The holdings are especially good for the Salem BLM District in that the library staff has given particular attention to subject indexes of the leading papers of Salem and Portland, Oregon, a project underway since 1911. Many of the materials in this library are available on inter-library loan to libraries throughout Oregon.

Bancroft's Library, University of California, Berkeley, California. Founded in the 1850s, this library is the first collection of materials on the history of the American West. By 1906 the collection had exceeded 50,000 titles. Hubert H. Bancroft built this library for the preparation of his 39 volume History of the Pacific States published in the 1880s. The collections have continued to grow and at present are over 250,000 volumes.
Included in this library are many oral histories, collected as early as 1879 from Oregon pioneers, extensive files of nineteenth century newspapers, and most of the rare maps and early published histories of the region. The library has extensive finding aids, including guides to manuscripts.

University of Washington Archives, Seattle, Washington. Independent of the University of Washington Library, this special collection contains the papers of professors associated with the university. Especially relevant to the ethnography of western Oregon are the papers of the late Melville Jacobs. Dr. Jacobs worked with the last surviving speakers of the Indians of the Willamette Valley. His wife, Bess, worked with some of the last Tillamook speakers. These papers, largely unpublished, are an excellent source for future ethnographic and linguistic studies.

National Archives, Pennsylvania Avenue, Washington, D.C. Established in the 1930s as the general depository of government records, this collection is of paramount importance to the documentation of federal activities in Oregon. The records include those of the Bureau of Indian Affairs, Department of the Treasury, the General Land Office, and other government agencies. Many of these materials—including the records of the Territory of Oregon—have been issued as microfilm publications and are held by Lewis and Clark College, the University of Oregon, the State Library, and the Oregon Historical Society.

Seattle Archives Center, Sand Point Way, Seattle, Washington. This regional depository of federal records serves as an adjunct to the National Archives in Washington, D.C., and is, today, the primary depository for records from the federal agencies in the Pacific Northwest. The center also holds on microfilm any of the older records which have been deposited in Washington, D.C. The Reference Section contains extensive finding aids to collections throughout the National Archives system.

Bureau of Land Management Records Center, Division of Technical Services, 5th and Summer Street, Portland, Oregon. This office maintains the records of the Cadastral surveys, surveyor's notes, the mineral surveys and patent records of mining claims, Indian allotment files, and general map files. Many of the original records have been "retired" to the archives center in Seattle; however, microfilm and microfiche copies are available in Portland.

Oregon Department of Geology and Mineral Industries Library, State Office Building, 1400 S.W. 6th Avenue, Portland, Oregon 97205. This library maintains extensive holdings on the geology of the Pacific Northwest and especially Oregon. It has many series of geological periodicals as well as complete holdings of the Department's publications. In its files are the field notes of some geologists carrying out mineral surveys and studies in the state.

Hornor Museum, Oregon State University, Corvallis, Oregon 97331. Established in the 1920s by Professor John Hornor, this collection includes many artifacts and objects associated with human activities in the Willamette Valley and especially Benton County. Collections of baskets from the Siletz and Grand Ronde reservations are a special feature of this museum's materials.

Clackamas County Historical Society Museum, 6th and Center streets, Oregon City, Oregon 97045. Located in a turn-of-the-century residence, this collection concentrates on objects and memorabilia associated with residents of Clackamas County. The museum holds some Indian artifacts and regional history publications.

Milwaukee Historical Museum, 2737 S.E. Adams Street, Milwaukie, Oregon 97222. Located in a farm house built in 1865, this museum has a collection of Indian artifacts, materials associated with the Portland Street Railway Co., and local historical objects.

Columbia County Historical Museum, 511 East Bridge Street, Vernonia, Oregon 97064. This museum has concentrated upon the logging history of the county and holds many artifacts associated with that important element of the economy. The library contains materials relating to county history. Some Indian artifacts are held by the museum.

Columbia County Historical Society, 45 S. 21st Street, St. Helens, Oregon 97051. This society collection is based upon articles associated with life in the county during the historical period. The small library includes publications about regional history.

Log Cabin Museum, 529 SW 9th Street, Newport, Oregon 97365. Maintained by the Lincoln County Historical Society, this museum has excellent but limited photograph collections, including material on the Siletz Indian Reservation and logging in the county. Among the artifacts are several examples of Indian clothing.
Linn County Museum, Spalding Street, Brownsville, Oregon 97327. The collections of this museum relate primarily to the history of the white occupation of the mid-Willamette Valley. Especially strong are artifacts and photographs which chronicle the region's agricultural development.

East Linn Museum, 746 Long Street, Sweet Home, Oregon 97386. Located in a former church, this museum holds artifacts associated with historic period activities in eastern Linn County.

Champoeg State Park, 7679 Champoeg Road, NE, St. Paul, Oregon 97137. Maintained by the State of Oregon, this interpretive visitor's center has excellent exhibits relating to the prehistory and history of the upper Willamette Valley. The special focus of the museum is the settlement of French Prairie and the evolution of government in the Oregon Territory.

Mission Mill Museum, 200 12th Street, S.E., Salem, Oregon 97301. Focused upon the Thomas Kay Woolen Mill (1889-1934) and three historic buildings dating from the mid-nineteenth century, this museum complex has both published and artifact materials from the mid-Willamette Valley. Many of the items held by the museum remain uncatalogued in 1980.

Newell House, Champoeg Road, N.E., St. Paul, Oregon 97137. Built in the mid-nineteenth century and restored by the O.A.R., this museum contains artifacts relating to life in frontier Oregon. A limited number of regional publications are among the holdings.

Oregon State Archives, 1005 Broadway N.E., Salem, Oregon 97310. This is the official depository of state materials in Oregon and includes the hearings of various government commissions, actions of the legislature, and other state bodies. The holdings are of limited use for Federal lands in that the functions of the state are clearly separate from those of the government in Washington, D.C.

On Yam Museum, Oregon Highway 99 East, Aurora, Oregon 97002. This excellent, local museum has artifacts, manuscripts, and publications associated with the Aurora utopian commune of the nineteenth century. The holdings are especially strong for furniture and tools associated with the Oregon frontier.

Scotts Mills Museum, 210 Grandview Avenue, Scotts Mills, Oregon 97375. Located in a former Christian Church, this museum has concentrated on artifacts associated with the history of the Scotts Mills area. It has holdings of photographs and genealogy.

Silverton Country Historical Museum, 428 South Water Street, Silverton, Oregon. This general collection covers the early white settlement through collections of memorabilia and photographs.

Genealogical Forum of Portland, Oregon, Inc., Library, 1410 SW Morrison, Portland, Oregon 97205. Concentrating upon genealogy, this library nevertheless has strong holdings on Oregon local history. Its cemetery inscription files, family histories, and pedigree charts make it especially useful in biographical research projects.

Library Association of Portland, SW 10th Avenue, Portland, Oregon 97205. Founded in the 1880s, this library holds many publications of regional interest, including indexes to the major Portland newspapers.

Western Forestry Center, 4033 SW Canyon Road, Portland, Oregon 97221. Established to educate the public about the forest products industry in Oregon, this regional collection contains several photographs and artifacts associated with logging and lumbering in the state.

Independence Heritage Museum, Box 283, Independence, Oregon 97351. Located in the former First Baptist Church, this small museum has materials associated with the history of Independence, Oregon.

West Salem Mennonite Brethren House, Box 209, Dallas, Oregon 97338. Located in the partially restored Brunk House on Highway 22, this museum is maintained by the Polk County Historical Society. It holds photographs, artifacts, objects, and publications associated with the county's history.

Tillamook County Pioneer Museum, 2106 2nd Street, Tillamook, Oregon 97141. The holdings of this museum are especially strong in natural history, particularly ornithology. Objects and Indian artifacts are mostly associated with the county and events important in the region's history.
Washington County Museum, 541 East Main Street, Hillsboro, Oregon 97123. This collection contains scrapbooks, manuscripts, artifacts, and objects associated with the development of Washington County. The museum is professionally staffed and has a modest publications program.

Yamhill County Historical Museum, 6th and Market streets, Lafayette, Oregon 97237. Located in the Poling Memorial Church, this collection is especially strong in objects associated with the white settlement of the Yamhill Valley in the late nineteenth century. It contains a limited collection of photographs and Indian artifacts.
ENVIRONMENTAL OVERVIEW

In a very general sense the character and behavior, social structures, and economies of prehistoric and historic peoples living in northwestern Oregon have been conditioned by the environmental factors present in the area. Prehistoric humans used simple but effective technologies to cope with these factors, and although modern technology has given us remarkable powers for the control or modification of the more critical of these basic elements, some are still very effective. Among these are the Pacific Ocean, rain and fog, clear running water, dense coniferous forests, and the mountains, hills, and grassy prairies. All have great influence in the Salem District of the Bureau of Land Management because northwestern Oregon lies immediately north and south of the 45th parallel, midway between the North Pole and the Equator on the western edge of the North American continent, and on the downwind, eastern rim of the Pacific Ocean. Prehistoric inhabitants found this area to be rich in foods and material resources. They adapted their subsistence strategies to utilize prairie, savannah and coniferous forest, valley and mountain, and seacoast and inland waters. Historic people developed their livelihoods in similar fashion for the same reason—various habitats contained a great number of usable soils, plants, and animals easily converted to human benefit.

GEOLOGY AND PHYSGRAPHY

An examination of the Salem District for factors limiting prehistoric and historic human behavior begins with the geology and physiography which underlie all features of the landscape and provide the parent material from which the soils of the area are derived. Northwestern Oregon has long been divided into five physiographic zones, all dividing it on a north/south axis, and all belonging to the geologic provinces found here.

The first of these bounds the district on the west and is a narrow, terraced marine coast, with frequent volcanic headlands rising from the continental shelf as it dips gradually to the west beneath the sea. This exposed coastal terrace has undergone extensive marine erosion and redeposition prior to and since the Wisconsin glacial period. As the sea rose again with the latest melting of the ice caps, intrusive basaltic plugs, dikes, and sills, and extrusive basalts, breccias, and pyroclastics of earlier Eocene and Miocene age have become more prominently exposed, overlying the softer Eocene sediments.

With the westward advance of the North American Tectonic Plate, these sedimentaries and volcanics have been buckled upward and folded to produce the Coast Range, the next eastward geologic province and physiographic zone. Here, too, erosion has exposed the Eocene volcanic intrusives and extrusives, producing steep-sloped peaks and ridges of moderate height (maximum 1240 m., average crestline 450 m.). River systems of the Coast Range flow westward to the Pacific, as well as eastward to the Willamette River from drainages that are interlocked the entire length of the range.

The third zone and province is the alluvial Willamette Valley, a structural syncline of marine Eocene and Oligocene sediments. Miocene Columbia River basalt makes up groups of prominent hills and buttes within the valley. The north-flowing, meandering Willamette River more or less bisects an area some 160 km. long north and south, and up to 65 km. wide east and west. Tributaries of the river, as well as the Willamette itself, are of the Yaxaa type, wherein juncture is finally accomplished after long parallel and braided courses.

The fourth zone and province, the Western Cascades, is composed of far older volcanics from Eocene, Oligocene, and the early Miocene. These are dissected by steep ridges and gorges cut by northwesterly flowing upper courses of the Sandy, Clackamas, Molalla, and Santiam rivers, the latter three being tributary to the Willamette River, and the first to the Columbia River.

The fifth and youngest zone and province is the High Cascades. Here the volcanic peaks and ridges are of more recent Pliocene and Pleistocene age, varying between 900 m and 1500 m in height, and featuring Mt. Hood and Mt. Jefferson, two glaciated peaks of over 3,000 m (Baldwin 1964; Dicken 1965; Loy et al. 1976; Mckee 1972).

The many different habitats that resulted from interactions of climate, flora, and fauna with these geologic and physiographic factors provided a wide range of exploitable resources and groups of resources to prehistoric and historic peoples. Obsidian was one vital, or at least desirable, raw material for the lithic industries of the native inhabitants from earliest times right on down to historic contact with Euro-American metallic tools and weapons. Recent work attempting to identify the sources of this material reports quarry sites in the High Cascades, and obsidian pebbles and cobbles have been
recovered from the beds of many streams flowing into the Willamette Valley from the Cascades. There are also some indications of an obsidian trade from sources east of the Cascades.

Other siliceous materials that provided, in one degree or another, the necessary lithic attributes of conchoidal fracture, sharpness of edge, hardness, durability, ease of manufacture, and perhaps aesthetic beauty were the cherts, agates, cryptocrystallines, and fine-grained basalts present in the alluvial gravels of the Willamette and Columbia River valleys.

After historic contact, gold, silver, copper, lead, and zinc provided stimuli for exploration, prospecting, exploitation, and settlement by Euro-American peoples in some areas of the Salem district. Highly productive mineral districts were discovered in southwestern, north-central, northeastern, and southeastern Oregon, and this influence led to an extensive yet generally unprofitable search for these minerals in northwestern Oregon. Small deposits were located and mined on the Molalla, North Santiam, and McKenzie rivers; at Fall Creek; and at Quartzville in Linn County (Dickson and Oicken 1979).

**CLIMATE**

The climate of the district is generally humid with mild winters at lower elevations, and cold winters in the high mountains. Annual precipitation varies considerably; it ranges from 1,000 mm to 2,000 mm along the coast; from 1,500 mm to over 2,500 mm in the Coast Range, and up to 3,200 mm at Valsetz; from 500 mm to 1,000 mm in the drier, leeside Willamette Valley; from 1,000 mm to over 2,500 mm in the Western Cascades; and from 2,000 mm to over 2,500 mm in the High Cascades. After southeastern Alaska and the Olympic Peninsula of Washington, the Oregon coast is the wettest part of the continental United States. Precipitation is as frequent as one day out of two. The Cascades have about the same number of days with precipitation, but they also receive snow to the extent that they are one of the regions of heaviest snowfall in this country. And the Columbia River Gorge is known locally as "the wind tunnel"—funneling marine air inward, and continental high pressure out to the Coast (Dickson 1965; Loy et al. 1976).

Precipitation decreases from the western foothills down into and across the valley, and increases in direct ratio to the elevation of the eastern foothills; temperatures and evapotranspiration increase from north to south; and the potential evapotranspiration of summer far exceeds the moisture buildup of winter in all areas of the valley except the riparian zone.

Although the climate of the District is unquestionably wet, it is also mild and generally benign. Temperatures reflect elevation and the predominant inflow of marine air from the Pacific Ocean. Lowest average temperatures for January are 6°C to 8°C on the coastal shelf; 2°C to 4°C in the Coast Range; 2°C to 4°C in the Willamette Valley and the Lower Columbia River; 0°C to 2°C in the Western Cascades and the Columbia River Gorge; and -6°C to 0°C in the High Cascades. Highest average temperatures in July are 14°C to 16°C on the coastal shelf; 16°C to 20°C in the Coast Range and the Lower Columbia River; 18°C to 20°C in the Willamette Valley and the Columbia River Gorge; 16°C to 18°C in the Western Cascades; and from 16°C to 18°C in the High Cascades. Generally temperatures drop 1°C for every 275 m increment in elevation. Changes in temperature due to latitude are slight. Changes in longitude produce a drop of about 1°C for every 25 km of eastward travel in January, and correspondingly increase in July, except for the higher elevations.

Wherever rainfall is as high and temperatures as mild as this, plants grow in high numbers and variety. Animals do likewise because of the availability of this large biomass for food. And humans have benefited correspondingly (Loy et al. 1976).

Hansen (1942, 1947) examined pollen profiles from the peat and sediments of Onion Flat and Lake Labish in the lower Willamette Valley to determine past climatic changes as they are represented by vegetation. Pollen counts of segments of the cores drilled into these two bog lake bottoms produced a vegetation profile indicating that after the peak of the Wisconsin glaciation, the climate changed from cool and very wet to warmer and drier. Hansen estimated this warm period to date between about 8,000 and 4,000 years before the present (B.P.). White pine and Sitka spruce declined very early in this period of change, around 7,000 to 8,000 B.P.; Western hemlock declined about 6,000 B.P.; and white fir declined much later than the hemlock, around 5,000 B.P. Douglas fir increased about 4,000 years ago, becoming dominant in spite of large fluctuations which varied conversely with Oregon white oak. Ponderosa pine increased to a peak around 4,600 to 4,000 B.P., as the climate became warmer and drier. At that point, the climate turned more moist, much like today. This favored the Douglas fir over the white oak up through the present, thus dampening their competitive fluctuations that were dictated by shorter-term wet/dry
swings in the climate. Ponderosa pine survived this greater wetness in those many areas of the Willamette Valley where it is still found in abundance. Lodgepole pine survived from the period when it flourished at the edges of the glaciers in Wisconsin, up to its present dominant location on the vegetation line of the coastal shelf.

Hansen's palynological investigations of paleo-environment in the Northwest support Antevs's (1948) model for the Great Basin, which was derived from geological evidence such as varved clay counts, lake salinity, and erosion sequences. These two overlapping models propose a climatic sequence that reflects several fluctuations in climate since the glacial retreat at the end of the Pleistocene, some 11,000 to 12,000 years ago.

Minor, Beckham, and Toepel (1979) discussed these, and other investigations into this problem, as follows:

The first period within the Holocene following the Pleistocene glacial period is termed the Anathermal by Antevs and the Early Postglacial (Period II) by Hansen. This period lasted from 9000 to 7000 years ago. It was a time of transition from the cold and wet climate of glacial times to increasing warmth and dryness. Climatic conditions were probably much like those of today by the end of this period.

Antevs calls the next stage the Altithermal and sets its range as 4500 to 7000 B.P. (Before Present). Hansen's comparable period is the Middle Postglacial (Period III), which ranges from 4000 to 8000 years ago. This climatic interval accelerated the warming and drying trend begun in the previous period, so that the general climate was distinctly hotter and more arid than at present. Evidence indicates that large lakes in the Great Basin area dried up and were drastically restricted or disappeared during this interval.

The most recent period, from 4500-4000 B.P. to the present day, is labeled the Medithermal by Antevs and the Late Postglacial (Period IV) by Hansen. The climate became cooler and moister, and lakes began to fill again as the climate returned to conditions which characterize the region at this time.

Recent archaeological and paleofaunal studies by Aschmann (1958), Bryan and Grunn (1964), Baumhoff and Heizer (1965), O'Connell and Haywood (1972), O'Connell and Ericson (1974), Grayson (1976), and Mehringer (1977) have led to a re-evaluation of the Antevs-Hansen scheme. Research indicates that the magnitude and rates of change during the Holocene epoch were relatively gradual. More importantly, it appears that the general climate at any one time had quite different effects depending upon the local environments. Effects are so variable in some places that the local climatic trends does not seem to follow the broad regional trend proposed above. Actually, the available data is conflicting and still too scanty to support even moderately well-defined paleoenvironmental sequence (or sequences) for the Northern Great Basin [or for Northwestern Oregon]. In the meantime, the Antevs-Hansen sequence should be understood as a very broad and generalized view of climatic processes for the last 9,000 years which are in fact quite intricate and locally influenced.

Shifts in climate and vegetation may have had profound effects on aboriginal cultures, resulting in an evolution of adaptive strategies which may be reflected in the archaeological record of Northwestern Oregon. This offers a promising avenue for future research in the region.

A present-day problem in archaeology was created by the warming of the climate at the end of the Wisconsin Ice Age. As the glaciers and ice caps melted, the seas rose. Sites that may have existed along the coast and coastal estuaries prior to this time would have been drowned. Many other sites, even though they may date later in time, have been partially or wholly destroyed by continuing marine erosion of the continent's edge.

**PEdology**

Soil groups resulting from weathering of the previously indicated geologic substrates and from the composting of dense plant communities over thousands of years are Spodosols, Inceptisols, and Entisols of the high rainfall Cascade Valleys and coast regions. Inceptisols, Alfisols, and Ultisols of the Coast Range and the Lower Western Cascades; Alfisols and Ultisols of the Coast Range and the Tower High Cascades; Alfisols, Ultisols,
Inceptisols, Mollisols, and Vertisols of the drier foothills and uplands verging the Willamette Valley; Mollisols, Alfisols, Vertisols, and Ultisols of the Willamette Valley floodplain and terraces; Inceptisols, Spodosols, and Entisols of the High Cascades; and Mollisols, Entisols, and Inceptisols above timberline on Mt. Hood and Mt. Jefferson (Loy et al. 1976).

Two factors relating to soil formation in the Salem District need special mention due to their controlling influence on archaeological efforts. The first factor is an event generally termed the Spokane/Missoula flood. Late in the Wisconsin, as the glacial ice was melting, a very large flood or series of floods swept down the Columbia River and spilled out into the Willamette Valley. This greatly modified existing surfaces and alluvial deposits, burying them under a thin veneer of silt in most areas and a layer of poorly sorted material in some others. Baldwin (1964) states that "the surface of the water was approximately 400 feet from sea level as shown by the distribution of ice-carried erratics." [Rocks from another area which were transported in floating icebergs that eventually grounded on hills as the water receded. This silt is] thin or missing along the lower slopes, but present on the low hills and lake beds on the floor of the valley.

The second factor is the relatively recent age of the upper soil levels and the topsoil of the Willamette Valley. Most of these soils have been deposited within the last 5000 years as this structural syncline filled with alluvials from the Coast and Cascade ranges, and as the heavy plant cover of the Late Postglacial period decayed, contributing its elements and humus.

Within the Willamette Valley proper, the postglacial history of the alluvial flood plains of the Willamette River and its tributaries is of particular archaeological interest. Balster and Parsons (1968) recognized nine major and four minor geomorphic surfaces within the valley. The five surfaces of most interest, because they are the most extensive and the ones on which major archaeological sites of the valley have been found, are the Horseshoe, the Ingram, the Winkle, the Calapooya, and the Senecal units. The Horseshoe unit, representing the present channel of the Willamette River, is the youngest. The Ingram unit represents the current flood plain, and the Winkle, an abandoned flood plain at a slightly higher elevation. The Calapooya unit, and the Senecal unit, which is a modification of it, are highest yet, and comprise the oldest major geomorphic surfaces of the valley proper. The relatively young Ingram and Winkle surfaces are best represented in the area between Eugene and Albany, west of the present course of the Willamette. The older Calapooya and Senecal surfaces are better represented east of the Willamette, and especially in the region around Salem. The occurrence of these surfaces of different ages is of obvious relevance to the discovery of remains of early prehistoric human settlement, but as yet no systematic study of their varying potentials has been carried out.

Considering these two factors, it is readily apparent that easily found sites on the valley floor will most likely be those less than 5,000 years in age--unless they have been exposed by contemporary land modifying activities or natural erosion; and that those of late Wisconsin times might have been eroded, buried, or redeposited by the Spokane/Missoula flood or floods. Thus, sites above 400 feet elevation on older exposed surfaces are the most likely to provide information on that long span of time stretching from the late Wisconsin up to the last 5,000 years.

FLORAL RESOURCES

Factors of latitude, elevation, topography, degree and direction of slope, soils, and weather have contributed to the makeup of the plant communities of northwestern Oregon. Modification of these communities in prehistoric and early historic time was accomplished by the practice of annual burning of the prairies and savannahs of the Willamette Valley by the Kalapuya Indians. In later historic time, it was accomplished by the white settlers' introduction of exotics, by cultivation, and by elimination of the practice of burning. The original flora had developed through processes of evolution, selection, migration, and succession over many millions of years. As primary producers, plants have always dominated the flow and cycling of energy, water and mineral nutrients within ecosystems. Furthermore, plants have determined much of the character of the landscape within which all organisms function, expressing climate, determining fauna, and providing basic subsistence and resource materials for humans (Walter 1973; Detling 1968; Loy et al. 1976; Kroeber 1939).

The most complex coniferous forests in the world are found here and in the adjacent areas of Oregon, Washington, British Columbia, Alaska, and Northern California. These trees dominate the landscape, and the concomitant absence of major dominant hardwoods is a unique phenomenon among the planet's mesic temperate forests. Other outstanding features
are the size and longevity of these dominants, and their biomass, which is the greatest of any plant associations of the temperate zones on earth (Franklin and Dyrness 1973; Loy et al. 1976).

Five vegetational zones are recognized in the forests of the Salem District. They are named for the dominant tree species found in each: the *Picea sitchensis* (Sitka spruce) zone of the Coast; the *Tsuga heterophylla* (western hemlock) zone of the Coast Range and the Western Cascades; the *Picea-Quercus-Pseudotsuga* (pine-oak-Douglas fir) zone of the relatively warmer and drier Willamette Valley; the *Abies amabilis* (Pacific silver fir) zone of the Western and High Cascades; and the *Tsuga mertensiana* (mountain hemlock) zone of the highest western slopes and crests of the High Cascades.

The *Picea sitchensis* (Sitka spruce) zone is found along the narrow coast at elevations up to around 150 m. Its additional constituents are *Tsuga heterophylla* (western hemlock), *Thuja plicata* (western red cedar), *Pseudotsuga menziesii* (Douglas fir), and *Abies grandis* (grand fir). *Alnus rubra* (red alder) is abundant on recently disturbed sites and along streams, and *Pinus contorta* (lodgepole pine) is common along the vegetational line on the ocean shore.

The understory community in mature forests is dense and is commonly composed of *Polystichum munitum* (imbricated swordfern), *Oxalis oregana* (Oregon oxalis), *Ranunculus aquatilis* (false lily-of-the-valley), *Menyanthes trifoliata* (western springbeauty), *Stellaria lasiocarpa* (yellow starwort), *Vicia sepium* (wild vetch), *Viburnum edule* (great huckleberry), and *Menziesia racemosa* (rustyleaf).

On sand dunes and steep slopes facing the ocean, *Quillaja salicina* (salal), *Rhododendron macrophyllum* (rhododendron), and *Vaccinium oxycoccos* (evergreen huckleberry) are commonly found. Wetter forested sites host *Ophiopanax horridus* (devil's club), *Athyrium filix-femina* (ladyfern), *Blechnum spicant* (deerfern), *Dryopteris aquatilis* (mountain woodfern), and *Sambucus racemosa* (red elderberry) (Franklin and Dyrness 1973).

The *Tsuga heterophylla* zone, found at elevations from 150 m to 1,000 m, is the most extensive within the district, being dominant in the Coast Range as well as the Western Cascades. This forest is famous for its subclimax of *Pseudotsuga menziesii* (Douglas fir), and climax of *Tsuga heterophylla* (western hemlock)/*Thuja plicata* (western red cedar). The zone has been wet, mild, maritime climate in the main, but moisture and temperatures vary greatly with distance from the Pacific Ocean, latitude, elevation, and the location of mountain ranges. These stresses result in clines within the community spectra along moisture gradients.

The dominant species are *Tsuga heterophylla* (western hemlock), *Pseudotsuga menziesii* (Douglas fir), and *Thuja plicata* (western red cedar). Sporadically encountered are *Abies grandis* (grand fir) and *Picea sitchensis* (Sitka spruce) near the coast; *Picea montana* (western white pine) and *Abies amabilis* (Pacific silver fir) in the higher elevations; and *Lindera douglasii* (incense cedar), *Picea lambertiana* (sugar pine), and *P. ponderosa* (ponderosa pine) along the southern boundaries of the Salem district. *Tsuga heterophylla* (western yew) is common throughout the zone, but is always subordinate to the other coniferous species, occupying a niche above the understory but below the overstory. *Alnus rubra* (western red alder), *Acer macrophyllum* (big-leaf maple), *Castanea pumila* (cherry), *Populus trichocarpa* (black cottonwood), and *Prunus lasiandra* (Oregon ash) are found on recently disturbed sites, and also along the riparian habitats where all the dominant species are. *Arbutus menziesii* (Pacific madrone) and *Quercus garryana* (Oregon white oak) are found on lower and dryer sites, especially in the foothills of the Willamette Valley (Franklin and Dyrness 1973).

The *Picea-Quercus-Pseudotsuga* (pine-oak-fir) zone of the Willamette Valley is relatively warm and dry compared to the other zones of the Salem district. Precipitation decreases and temperatures increase from the north to the south; precipitation decreases from west to east descending the eastern slope of the Coast Range. It reaches a minimum within the Willamette Valley, and increases again as the western foothills of the Cascade Range are ascended. Potential evapotranspiration of summer far exceeds the winter's buildup of available plant moisture. The vegetation of this zone has not only been determined by these conditions, it has also been dominated by man's activities—prior to Euro-American contact and subsequent dominance, the Indians of this zone periodically burned the vegetation, thus modifying it; after the 1860s, it was and continues to be dominated and molded by fire control, clearing, logging, grazing, farming, and by the construction of dwellings, cities, roads, railroads, and drainage canals.

*Quercus garryana* (Oregon white oak) is often the sole dominant in this zone, although *Acer macrophyllum* (big-leaf maple), *Pseudotsuga menziesii* (Douglas fir) and/or *Arbutus menziesii* (Pacific madrone), are frequently associated with it. Four major understory
communities are recognized: Corylus cornuta (hazelnut), Polystichum munitum (swordfern) and Amelanchier alnifolia (service-berry), Symphoricarpos albus (snowberry) found in the least disturbed sites; Prunus avium (nazzard cherry--an introduced species), Symphoricarpos albus (snowberry), and Rhus diversiloba (poison oak), the latter the most widespread and tolerant of dry conditions. This last community is related to heavy grazing and may be the consequence of it. Being less palatable to livestock than other plants, it gains a dominant position in the vegetational community, which it then maintains even when grazing is stopped (Franklin and Dyrness 1973).

The Abies amabilis (Pacific silver fir) zone is found on the western slopes of the Cascade Range, generally at elevations from 1000 m to 1600 m in the Salem district. It is considered by botanists as either a sub-alpine or a cool temperate community, the latter being a more recently favored designation. Composition of this forest varies widely with age, fire history, and site. Major associated overstory species in addition to Abies amabilis (Pacific silver fir) are Tsuga heterophylla (western hemlock), Abies procera (noble fir), Pseudotsuga menziesii (Douglas fir), Thuja plicata (western red cedar), and Pinus monticola (western white pine). Other species occurring are Abies lasiocarpa (subalpine fir), A. grandis (grand fir), Picea engelmannii (Englemann spruce), Pino contorta (lodgepole pine), and Larix occidentalis (western larch).

Understory species are most frequently of the genera Vaccinium (huckleberry), Menziesii (rustyleaf), Gaultheria (salal), Chamaephyllum (Prince's pine), Rhododendron (rhododendron), Pyrola (pyrola), Cornus (dogwood), Rubus (blackberry), and Xerophyllum (beergass) (Franklin and Dyrness 1973).

The Tsuga mertensiana (mountain hemlock) zone occupies the highest slopes and crests of the High Cascades at elevations between 1600 m and approximately 2000 m, just below the alpine zone. It intergrades to the last with the Abies lasiocarpa (sub-alpine fir) zone. Two subzones are recognized, the lower being a "closed forest" characterized by a continuous cover of Tsuga mertensiana (mountain hemlock) and its associates, and the upper being a mosaic of forest and shrubby or herbaceous open parkland. Both subzones are the wettest and coolest found in western Oregon. Forest composition varies considerably, with Tsuga mertensiana dominating in the older growth; Abies lasiocarpa (subalpine fir) and Pinus contorta being more common in better drained areas; Abies amabilis (Pacific silver fir) and Chamaecyparis nootkatensis (Alaska cedar) occurring commonly to sporadically; and Pseudotsuga menziesii (Douglas fir), and Pinus monticola (western white pine) being minor associates.

A wide variety of understory species are found, including but not limited to the families of Ericaceae, Rosaceae, and Compositae. Prominent genera are Vaccinium (huckleberry), Juniperus (juniper), Rhododendron (heath), Chamaephyllum (Prince's pine), and Arctostaphylos (manzanita).

Many of the plants of the district produce edible berries, fruits, seeds, tubers or nuts. A partial list follows.

Berries are the Rubus spp. (blackberry, blackcap, salmonberry), Ribes spp. (currant), Sambucus spp. (elderberry), Fragaria (strawberry), Vaccinium spp. (huckleberry), Rosa spp. (wild rose), Gaultheria shallon (salal), and Amelanchier alnifolia (serviceberry).

Fruits are the Prunus spp. (wild cherry) and Pyrus spp. (crabapple).

Seeds are the Medicago spp. (tarweed), Helenium annua (wild sunflower), and possibly Balsamorhiza sagittata (arrowleaf balsamroot).

Tubers are Sagittaria latifolia (wapato), Camassia spp. (camos), Erythrinum spp. (wild carrot), Calochortus mariposa lily, and Allium spp. (wild onion).

Nuts are Corylus cornuta (hazelnut) and Quercus garryana (acorn) (Zenk 1976).

Presently known archaeological and ethnographic evidence indicates that true domesticated plants and tillage agriculture were unknown in this district. However, selective harvesting of a variety of wild plant foods was widespread, and was accompanied by storage for winter use. Further, annual burning by the Kalapuya Indians of large areas of the Willamette Valley in late summer or early fall modified floral and faunal patterns. This form of environmental manipulation resulted in open and savannah-type grassy landscapes; it increased the availability of seeds such as Medicago spp. (tarweed), and Helenium annua (wild sunflower); it cleared the ground under the savannah-scarred oaks for the gathering of acorns; and it concentrated deer, elk, and migratory waterfowl for hunting, and grasshoppers for gathering. It is quite likely that the growth of Camassia spp. (camos), Allium spp. (wild onion), Calochortus spp. (mariposa lily), Lomatium spp. (wild carrot), and other such tuber and root foods was encouraged by the removal of competitor plants and by the fertilizing action of the ashes. Small patches of forested ground were also burned for the broadcasting of non-native Nicotiana (native tobacco) seeds obtained in trade. It has also been inferred that hazelnut withies suitable for basketry were obtained as a result of the annual burning (Boyd n.d.).
This annual burning by the Kalapuya was reduced in the 1830s to 1840s due to population
takes from Euro-American diseases; and to conflicts with the immigrants who began arriving
in the late 1830s and early 1840s. Indiscriminate burning was neither practiced nor
tolerated by the white settlers, as it had too great a potential for destroying improvements
such as fences, barns, houses, and bridges, as well as cultivated crops. With fire no longer
an environmental modulator, oak savannas became oak forests on the foothills and in the
prairies, and Douglas fir began to move down from the ridges onto the hills and out into
the valleys. The white man's culture thus began its dominance of the valley and foothill en-
vironment through both action and neglect of action.

FAUNAL RESOURCES

The most important aboriginally utilized faunal resources of the Northwest Coast were
the anadromous fishes. These salmon, steelhead, smelt, whitefish, and eels return to the
sea or brackish water after spawning or being spawned. There, in their ancestral habitat,
they mature, returning to that particular spawning bed in a certain stream to repeat the
cycle. All were of great importance to prehistoric and historic peoples, shaping sub-
sistence patterns and cultural practices, even if they did not make up the major portion
of the diet in all groups. At the time of contact, and for a period afterwards, they were
taken in large numbers, dried, pounded into a meal, and packed in salmon-skin-lined baskets
for winter food. These containers were traded to non-fishing tribes at great distances,
and were a major item at the great trading/gambling/socializing centers in certain seasons.
Smelt, also known as eulachon or candlefish, were rendered into an oil that was very valuable
as a prestige item, for consumption and display, and as a lavish gift.

The falls of the Willamette River at present day Oregon City provided a control on
this anadromous resource that is reflected in the archaeological and ethnographic record.
The Kalapuya lived above the falls and appear to have been dependent primarily upon vege-
table, bird, and animal protein, a logical consequence of the fact that only limited numbers
of anadromous fish were able to ascend the fall's falls, and then only during periods of favorably
high water. Below the falls, other subsistence patterns prevailed that were heavily
oriented toward the utilization of these numerous and readily available fish.

Historically, the Astor Fur Co., the North West Co., the Hudson Bay Co., and Andrew
Wyeth's enterprises all took a try at salmon salting, attempting to utilize this abundant
resource for their own men, as a ship's chandler's item, and as a possible money-making
export. With the advent of salmon canning in the 1870s and 1880s, utilizing Chinese
laborers, the industry began an expansion that was to spread up and down the North Pacific
Coast as far as Alaska and California. Subsequent to the construction of power and flood
control dams on the Columbia River and its main tributaries, plus an obvious overfishing of
what had seemed at one time to be an inexhaustible resource, this period and this resource
have come to a predictable end. The environment, in this case, has been altered by the
near extinction of the Salmonid anadromous fishes by a lack of foresight and restraint on
the part of Euro-American cultures.

Among the more important fishes, anadromous and otherwise, were the following. Pre-
historic people ate all of them in various areas on occasion, with ethnographic accounts
emphasizing the pre-eminence of salmon, steelhead, smelt, trout, whitefish, and eel in
historic times; and with the historic and contemporary record showing Euro-American pre-
ference for these same species (Boyd 1973; Lyle et al. 1976).

Anadromous:
- Proscipio s. williamsoni - mountain whitefish
- Salmo olopmi olopmi - coastal cutthroat trout
- S. gairdneri - rainbow trout (steelhead)
- Oncorhynchus gorbuscha - pink salmon - coastal waters only
- O. keta - chum salmon - coastal waters only
- O. kisutch - coho salmon
- O. nerka - sockeye salmon
- O. tshawytscha - Chinook salmon - the largest and most highly prized
- Lampetra tridentata - Pacific lamprey - roasted or smoked
- L. whittii - river lamprey - roasted or smoked
- L. pacifica (richardsoni) - Pacific brook lamprey - roasted or smoked
- Thaleichthys pacificus - eulachon (smelt) - also known as candlefish
- Spirinchus thaleichthys - longfin smelt - also known as candlefish
- Acipenser mediocris - green sturgeon - principally coastal waters
- A. trionemontianus - white sturgeon - inland waters - highly prized

Freshwater fishes of prehistoric economic importance:
- Catostomus platyrhynchos - mountain sucker
- C. macrocheilus - largescale sucker
- C. oregens - bridgelpick sucker
- Alosa olympica - chiselmouth
Hybopsis arnemii - Oregon chub.
Ptychocheilus oregonensis - northern squawfish.
Richardsonius balteatus - redside shiner.
Oila bicolor columbiana - tui chub or "roach."
Mylocheilus caurinus - peamouth.
Rhinichthys cataractae dulcis - longnose dace.
R. falco - leopard dace.
R. ocellatus nubilus - blackside dace.
Pororhina tawamontana - sandroller.
Lota lota - burbot (anadromous).
Micropterus dolomieu - smallmouth bass.
Platichthys stellatus - starry flounder.

Mammals were next in importance in the faunal utilization practices of the prehistoric and historic peoples of the Salem District. Fur, teeth, antlers, horn, and bone were extensively utilized for tools, weapons, adornment, and as ceremonial regalia. A list of such broadly utilized species follows, being organized as to biological family, trophic size, and availability, not as to cultural preference or prominence in a particular cultural diet (Collins 1951; Burt & Grossenheimer 1964; Ingles 1965; White 1975; Towsie 1979).

Cervus canadensis (wapiti or elk). Inhabited prairie and savannah, as well as dense forests. Settlement of the Willamette Valley drove this species up into the hills and mountains. Gross weight can reach 1,000 pounds per animal.

Odocoileus hemionus (male deer). Ranges principally east of the Cascade mountains in more open country, but also intergrades with blacktailed deer in the High Cascades. Gross weight, 200-225 pounds.

O. columbianus (blacktailed deer). Found in thickets and dense forest, wintering on lower slopes of the valleys, and foraging to higher slopes in early summer. Gross weight, 120-150 pounds. A principal animal food.

O. virginianus (white-tailed deer). Prefers dense forest and brush in low marshy flood-plains along the Columbia River. Gross weight, 80-100 pounds.

Lagurus ocellatus (black-tailed hare, "jackrabbit"). Practically all plant communities harbor this animal, except those of the higher mountains.

L. amercianus (snowshoe hare). Found in fir thickets and in dense riparian forest.

Sylvilagus bachmani (brush rabbit). Found in brushy areas, including the Coast Range.

Aplodontia rufa (mountain beaver). Found in all areas of the district, and especially where salmonberry, thimbleberry, and/or huckleberry are found.

Spermophilus beechei (Beechey or California ground squirrel). Found up to the Hudsonian Life of the Cascades, and widely present in the Willamette Valley.

S. lateralis (golden-mantled ground squirrel). Found in the forests of the High Cascades.

Eutamias townsendii (Townsend chipmunk). Found in hemlock and fir forests of northwestern Oregon.

Tamias sibiricus (western gray squirrel). Generally found in the oak forests of the Willamette Valley.

Tamiasciurus douglasii (Douglas' tree squirrel). Found in fir, spruce, and hemlock forests of the Coast Range and the Cascades.

Glaucopsyche pabinus (northern flying squirrel). Found in fir, spruce, and hemlock forests of the Coast Range and the Cascades.

Phonomys bulbivorus (camas pocket gopher). Skin made into robes.

P. macaca (mazama pocket gopher). Same.

Castor canadensis (beaver). Found throughout the Salem District, and the basis for Indian economy after the establishment of the fur trade by Euro-Americans.

Neotoma fuscipes (dusky-footed woodrat). Found in the Willamette Valley.

N. cinerea (brushy-tailed woodrat). Found throughout Oregon.

Ondatra zibethicus (muskrat). Found along slow-moving watercourses and in ponds and sloughs of northwestern Oregon.

Erithizon dorsatum (porcupine). Principally found in less humid coniferous forests such as the eastern slopes of the Coast Range eastwards to the High Cascades.

Canis latrans (coyote). Native to all of northwestern Oregon, and a figure in the legends of many native cultures.
C. lupus (gray wolf). Now thought to be extinct in northwestern Oregon, but in prehistoric times, as well as historic, was found throughout the district in the more open prairie and savannah habitats.

Urocyon cinereoargenteus (gray fox). Found throughout western Oregon.

Felis concolor (mountain lion). Found throughout the district.

F. lynx (lynx). Same.

F. rufus (bobcat). Same.

Ursus americanus (black bear). Found throughout the forested regions of northwestern Oregon.

U. arctos (grizzly bear). Now extinct, but it was common in the Willamette Valley up into historic times. Settlement brought extinction to this dangerous and unpredictable predator. Their predation on immigrant cattle herds was not to be tolerated.

Procyon lotor (raccoon). Widely found near water in the entire district.

Martes americana (marten). Found in coniferous forests of the Coast Range and the Cascades.

M. pennanti (fisher). Same.

Mustela erminea (ermine). Found in most areas of northwestern Oregon.

M. frenata (long-tailed weasel). Same.

M. vison (mink). Widely found along marshes, lakes, and streams.

Urocyon cinereoargenteus (wolverine). Found today only in the higher mountains.

Spilogale gracilis (western spotted skunk). Found throughout the district.

Mephitis mephitis (striped skunk). Same.

Lutra canadensis (river otter). Found throughout northwestern Oregon. See comment below.

Enhydra lutris (sea otter). Found off the coast in the kelp beds, but frequently seen on rocks closer to shore. These animals were the cause of the "fur boom" following Gray's and Vancouver's voyages of discovery.

Although today it appears, ethnographically and archaeologically, that whales, dolphins, and porpoises were not hunted by the aboriginal peoples of northwestern Oregon as they were further north on the Pacific Coast by other peoples, seasonal migration of many species of these large mammals would have provided a yearly number of dead, dying, and stranded animals on the beaches, available for rendering into an oil that historic accounts tell us was highly prized as a food. It has also been noted ethnographically that coastal Indians took seals from their rocky resting areas, and that the Tualatin hunted seals in the Interior rivers during salmon runs as they followed the anadromous fish upstream. The following species of pinnipeds are found on the Oregon coast or in rivers that support salmon runs, particularly the Columbia and Willamette Rivers in the Salem District. A very large number of Cetacea (whales, dolphins, and porpoises) would have provided the scavenging opportunities aforementioned.

Callorhinus ursinus (northern fur seal).

Eumetopias jubata (northern sea lion).

Zalophus californianus (California sea lion).

Phoca vitulina (harbor seal).

Mirounga angustirostris (northern elephant seal).

Shellfish of both fresh and marine waters, and freshwater crayfish were extensively utilized in numbers and variety to the point that they might have been the third most important protein source. A person need view only one of the remaining, though highly eroded (by rising post-glacial seas), shellfish middens along the coast to realize the importance of this long-standing food practice. In areas not too far up the coast, clams and mussels are still gathered in large quantities, dried, and eaten in winter by aboriginal peoples of similar Northwest Coast cultures.

Collins (1951) reported that some interior riverine Kalapuya middens contained freshwater mussel shells. In addition, occasional grave goods included shells of Olivella, Dentella, Natica, Patella, Limpet, Partula, and Littorina, all evidently used as adornment of the dead, as a display of wealth, and as an aesthetic expression.

Possibly fourth in importance as a protein source were the birds. Extensive waterfowl hunting is recorded historically and ethnographically. This is understandable when one thinks in ornithological terms on the importance of the Coastal and the Willamette Valley routes of the Pacific Migratory Flyway. Considering also the great variety of habitats and
elevations available to birds in the Salem District, it should come as little surprise to learn that over 400 species of birds have been recorded as migrating, breeding, or wintering in Oregon. Therefore, the Aves offered opportunity for egg and fledgling gathering from nesting colonies, principally on the coastal cliffs, as well as abundant hunting of huge flocks of waterfowl in migration season.

A list of the larger trophic sizes of coastal and inland birds follows. It is organized by family to conserve space (Peterson 1969).

**Gaviidae** - 3 sp. loon
**Podicipedidae** - 5 sp. grebe
**Procellariidae** - 1 sp. fulmar, 2 sp. shearwater, 3 sp. petrel
**Pelecanidae** - 2 sp. pelican
**Phalacrocoracidae** - 3 sp. coonpant
**Cygniidae** - 1 sp. swan
**Anserinae** - 5 sp. geese (one sp. brant is native to the mid-Willamette Valley).
**Anatinae** - 8 sp. duck, 1 sp. wood duck
**Aythinae** - 14 sp. duck
**Oxyurinae** - 1 sp. duck
**Merginae** - 3 sp. merganser
**Cathartidae** - 1 sp. vulture, 1 sp. condor (reported by Lewis and Clark at the mouth of the Columbia River, 1805)

**Elaninae** - 1 sp. kite
**Accipitrifinae** - 3 sp. hawk
**Circinae** - 1 sp. harrier
**Buteoninae** - 4 sp. hawk, 2 sp. eagle
**Pandionidae** - 1 sp. osprey
**Falconinae** - 4 sp. falcon
**Tetroninae** - 2 sp. grouse
**Phasianidae** - 3 sp. quail
**Andeidae** - 2 sp. egret, 2 sp. bittern, 4 sp. heron
**Gruidae** - 1 sp. crane
**Rallidae** - rail, sora, and coot
**Haematopodidae** - 1 sp. oystercatcher
**Charadriidae** - 3 sp. plover, 1 sp. killdeer
**Scolopacidae** - 17 sandpipers, etc., snipe
**Phalaropodidae** - 3 sp. phalarope
**Larinae** - 9 sp. gull
**Sterninae** - 3 sp. tern
**Alcidae** - murre, guillemot, puffin, 2 sp. auklet, 2 sp. murrelet
**Columbidae** - 1 sp. pigeon, 2 sp. dove
**Tytonidae** - 1 sp. barn owl
**Strigidae** - 12 sp. owl
**Corvida** - 3 species jay, 2 species crow, 1 sp. raven.

As previously noted in the discussion of aboriginal burning, grasshoppers were gathered for a winter food following the annual firing of the prairies and savannahs. Caterpillars of certain species (possibly the "tent" caterpillars) were also roasted and eaten in season, as well as the larvae of the yellow-jacket wasp on occasion.

Not much is known about the utilization of amphibians and reptiles except that some cultures were recorded as having words for these creatures. Others were noted as using rattlesnake venom on projectile points for hunting large game such as the grizzly bear.

**CONCLUSION**

In the Bureau of Land Management Salem District native cultures have probably functioned as organisms in basically similar fashion no matter what the time frame, because the benign, abundant, and highly diverse environment has been essentially the same. Today, we live by means of these same resources, on the same lands and waters, and under the influence of the same basic factors of climate, geography, flora, and fauna as the prehistoric and historic "Oregonians." It is now our responsibility to utilize wisely, to manage effectively, and to conserve these resources so that generations following will know, appreciate, and enjoy this same rich environment that we have known as northwestern Oregon.
ARCHAEOLOGICAL OVERVIEW

The Salem District of the Bureau of Land Management administers federal lands distributed over a large area of northwestern Oregon. For the purpose of reviewing the archaeological record in this region as it is presently known, this portion of Oregon can be divided into four distinct cultural-ecological provinces: namely, the Lower Columbia Valley, the Willamette Valley, the Northern Oregon Cascade Range, and the Northern Oregon Coast.

The results of both ethnographic and archaeological research indicate that aboriginal peoples followed a way of life closely adapted to the specific subsistence resources available within each of these provinces. Indeed, the geography of northwestern Oregon presented natural barriers tending to encourage the development of native cultures within each province which were distinct in many ways from the lifeways of their aboriginal neighbors.

The ethnographic lifeways of the aboriginal peoples inhabiting northwestern Oregon in early historic times represent the climax of local cultural traditions which developed over a period of many thousands of years. The following section of this Cultural Resource Overview summarizes the information presently available on prehistoric cultural developments in northwestern Oregon, from the earliest evidence for aboriginal peoples in the region up to the time of historic contact in the early nineteenth century. The archaeological sites and projects referred to in the discussion are listed by subregion in Table 2; their locations are indicated in Figure 2.

### TABLE 2
Major Archaeological Sites and Projects by Subregion in Northwestern Oregon

<table>
<thead>
<tr>
<th>Map No.</th>
<th>Location</th>
<th>Literature References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LOWER COLUMBIA VALLEY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Dalles Area</td>
<td>Strong et al. 1930</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Butler 1959</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cressman et al. 1960</td>
</tr>
<tr>
<td>2</td>
<td>Bonneville Dam</td>
<td>Krieger 1935</td>
</tr>
<tr>
<td></td>
<td>Reservoir Area</td>
<td>Cole and Southard 1971</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cole 1974</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phebus 1978</td>
</tr>
<tr>
<td>3</td>
<td>Portland Basin</td>
<td>Pettigrew 1977</td>
</tr>
<tr>
<td>4</td>
<td>WILLAMETTE VALLEY-NORTHERN OREGON CASCADES</td>
<td>Cressman and Laughlin 1941</td>
</tr>
<tr>
<td>5</td>
<td>Lebanon Site</td>
<td>Cressman 1947</td>
</tr>
<tr>
<td>6</td>
<td>Tangent Site</td>
<td>Allery 1975</td>
</tr>
<tr>
<td>7</td>
<td>Mahawk Valley</td>
<td>Newman 1966</td>
</tr>
<tr>
<td>8</td>
<td>Cascadia Cave</td>
<td>Woodward 1972</td>
</tr>
<tr>
<td>9</td>
<td>Geertz Site</td>
<td>Olsen 1975</td>
</tr>
<tr>
<td>10</td>
<td>Baby Rockshelter</td>
<td>Reckendorf and Parsons 1966</td>
</tr>
<tr>
<td>11</td>
<td>Luckiamute Heath</td>
<td>Cole 1968</td>
</tr>
<tr>
<td>12</td>
<td>Fall Creek Sites</td>
<td>Miller 1970, 1975</td>
</tr>
<tr>
<td>13</td>
<td>Benjamin Sites</td>
<td>White 1974, 1975a</td>
</tr>
<tr>
<td>14</td>
<td>Hurd Site</td>
<td>Cordell 1967, 1975</td>
</tr>
<tr>
<td>15</td>
<td>Lingo Site</td>
<td>Pettigrew 1980</td>
</tr>
<tr>
<td>16</td>
<td>Salem Sites</td>
<td>Minor and Toepel 1979</td>
</tr>
<tr>
<td>17</td>
<td>Flanagan Site</td>
<td>Laughlin 1943</td>
</tr>
<tr>
<td>18</td>
<td>Fuller and Fanning Mounds</td>
<td>Laughlin 1941</td>
</tr>
<tr>
<td>19</td>
<td>Spurland and Miller Mounds</td>
<td>Laughlin 1941</td>
</tr>
<tr>
<td>20</td>
<td>Halsey and Shedh Mounds</td>
<td>Laughlin 1941</td>
</tr>
<tr>
<td>21</td>
<td>Lynch Site</td>
<td>Sanford 1975</td>
</tr>
<tr>
<td>22</td>
<td>Davidson Site</td>
<td>Davis et al. 1973</td>
</tr>
<tr>
<td>23</td>
<td>Gettings Creek Sites</td>
<td>White 1974, 1975b</td>
</tr>
<tr>
<td>24</td>
<td>Scoogg Creek Site</td>
<td>Davis 1970a</td>
</tr>
<tr>
<td>25</td>
<td>Beebe Site</td>
<td>Follensbee 1975</td>
</tr>
<tr>
<td>26</td>
<td>Halverson Site</td>
<td>Minor and Toepel 1980</td>
</tr>
<tr>
<td>27</td>
<td>Indian Ridge Site</td>
<td>Henn 1975</td>
</tr>
<tr>
<td></td>
<td>Siuslaw Falls Site</td>
<td>Pettigrew 1975</td>
</tr>
</tbody>
</table>
TABLE 2 continued

<table>
<thead>
<tr>
<th>Map No.</th>
<th>Location</th>
<th>Literature References</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Netarts’ Sand Spit</td>
<td>Newman 1959</td>
</tr>
<tr>
<td>29</td>
<td>Seal Rock</td>
<td>Ross 1975; Ranbo 1978</td>
</tr>
<tr>
<td>30</td>
<td>Oceanside Site</td>
<td>Zontek 1978</td>
</tr>
<tr>
<td>31</td>
<td>Palmore and Par-tee Sites</td>
<td>Rhebus and Drucker 1973, 1979</td>
</tr>
<tr>
<td>32</td>
<td>Umpqua-Eden Site</td>
<td>Ross and Snyder 1979</td>
</tr>
</tbody>
</table>

PALEOCLIMATIC CONSIDERATIONS

One of the basic goals of archaeological research is to relate changes in the subsistence patterns and material culture of prehistoric peoples to the fluctuations in climate which have occurred in the past. Although few correlations of this nature have so far been attempted by archaeologists working in northwestern Oregon, some familiarity of the paleoclimatic background of the region may prove useful for understanding and interpreting future archaeological discoveries.

Studies of paleoclimatic conditions in the Pacific Northwest, based primarily on analyses of pollen profiles and the fluctuations of glaciers, indicate that there have been several changes in climate since the retreat of continental glaciers at the end of the Pleistocene. As a result of numerous pollen studies over a wide area of the Pacific Northwest, including analysis of pollen from several localities in northwestern Oregon by Hansen (1941a, 1941b, 1942; Hanson and Allison 1942; Hanson and Packard 1949), three main climatic periods have been distinguished which span the last 15,000 years.

The period following the retreat of continental glaciers in the Pacific Northwest is generally referred to as the Early Postglacial (Hansen 1947:115; Heusser 1960:183). This climatic period, which is estimated to range from 15,000 to 8000 years ago, was a time of transition from cool and moist to warm and dry conditions as the influence of glaciation became more remote. In the later stages of this period the climate was similar to that of the present.

The following climatic interval is variously referred to as the Middle Postglacial (Hansen 1947:116) or Hypsithermal (Heusser 1960:184). This was a period of accelerated warming and drying which attained its maximum between 8000 and 4000 years ago.

The final period, from 4000 years ago to the present, is known as the Late Postglacial (Hansen 1947:118; Heusser 1960:186). This period saw a return to the cooler and moister climatic conditions characteristic of the Pacific Northwest at the present time.

In addition to affecting the vegetation and wildlife of the region, the warming and drying trend which began during the Early Postglacial was responsible for changes in sea level. With the general increase in temperatures, water that was formerly stored on land in the form of glaciers was released, raising the level of the ocean. According to Dicken and others (1976:1), sea level along the Oregon coast became relatively stable by around 6000 years ago, although it has also been suggested that the level of the ocean has continued to rise, though more slowly, during the last 6000 years as well (Shepard 1964). This general rise in sea level resulted in the drowning of the lower courses of rivers along the Oregon coast, as indicated by the fact that tidal action extends for long distances up these streams (Baldwin 1945; Lowry and Baldwin 1952; Dicken et al. 1976).

Changes in climate and sea level during the last 15,000 years undoubtedly had a profound effect on the lifeways of prehistoric peoples inhabiting the Pacific Northwest. The exact nature and magnitude of these effects, however, will only be understood through future studies of human occupation patterns in the region. Such studies are necessary in order to learn how human use may have shifted through time, fluctuated in response to seasonal and climatic changes, and varied in different environmental zones. It is these kinds of changes and variations in the lifeways of prehistoric cultures that archaeologists seek to discern in the archaeological record of northwestern Oregon.
Figure 2. Location of Major Archaeological Sites in Northwestern Oregon (Key, Table 2).
The Lower Columbia Valley is usually defined as that area along the Columbia River extending from The Dalles to the Pacific Ocean. In aboriginal times the principal occupants of this stretch of the Columbia River were various bands of Chinookan-speaking peoples. Of considerable importance to the aboriginal inhabitants along the Lower Columbia were the runs of anadromous fish, different species of which passed up the river at different times of the year. The occurrence of these anadromous fish runs, together with the relative abundance of other subsistence resources, allowed the aboriginal peoples of the region to establish a society consisting of several distinct social classes which resided in large semipermanent villages. Indeed, according to Kroeber (1939:136-165), at the time of historic contact the Lower Columbia Valley supported the second highest population density of any area in the Pacific Northwest. Archaeological evidence collected in this region indicates that aboriginal utilization of the economic resources of the Lower Columbia Valley began as early as 10,000 years ago.

History of Archaeological Research

Archaeological research in the Lower Columbia River Valley has a long history. Most of the past archaeological fieldwork has been concentrated in three general localities: The Dalles Dam Reservoir area, the Bonneville Dam Reservoir area, and the Portland-Vancouver area.

The earliest archaeological research in The Dalles region was conducted from 1924 to 1926 by archaeologists from the University of California. The project consisted of a general reconnaissance which subsequently led to a petroglyph study (Strong and Schenk 1925) and the excavation of several sites in the vicinity of Miller's Island (Strong et al. 1930). This research also resulted in an article describing carvings of human, animal and geometric figures on bone, antler and horn recovered from sites in this area (Steward 1927); and an article about peripherally flaked cobbles which Steward (1928) suggested were used as "throwing stones." Subsequent archaeological research has shown that these distinctive artifacts are common in sites along the Lower and Middle Columbia River, and that these implements were most likely used as hide-scrapping tools (Valley 1979).

The University of Oregon conducted its first project in The Dalles area in the 1930s at a site threatened with destruction from highway construction. L. S. Cressman directed excavations at the Big Eddy Site (WS-1), located on the downstream end of the Long Narrows of the Columbia River and upstream from The Dalles (Drews 1938). This significant site was revisited in the late 1960s by the University of Oregon for further excavation (Cressman et al. 1960).

Archaeological salvage work associated with the construction of The Dalles Dam in the 1950s spawned a lengthy series of reports. A survey and preliminary excavations were conducted by Joel Shimer of the Smithsonian Institution River Basin Survey program (Shimer 1952, 1953). The archaeological salvage program for sites threatened on the Oregon side of the river was contracted to the University of Oregon by the National Park Service in 1952. This program continued under the direction of L. S. Cressman until 1957 and resulted in several formal reports (Cressman and Emmons 1953; Cole 1954; Cressman et al. 1960). During this time, the Big Eddy Site (WS-1) was revisited and excavations were also conducted at the Elsberry Rapids Site (WS-4). Together, these two sites form the core of the archaeological sequence extending back from historic times to around 10,000 years ago.

On the Washington side of the Columbia River, archaeological salvage work in The Dalles Dam Reservoir area was carried out by the University of Washington, also under contract with the National Park Service, for three seasons under the direction of Douglas Osborne. Several sites were excavated and reported in numerous articles and reports (Butler 1955, 1957a, 1957b, 1958a, 1958b, 1959, 1960, 1961, 1962a, 1962b, 1963, 1964, 1965a, 1965b; Caldwell 1956, 1957; Garner 1963; Weld 1959). The most extensive excavations were conducted at Wakinap Mound, a major village site, which was occupied from 1200 B.P. to historic times (Caldwell 1956; Butler 1960). The oldest archaeological occupation on the Washington side of the river was at the Indian Well Site, which according to Butler (1959, 1961) may have been occupied as early as 10,000 years ago.

Most of The Dalles area is the Columbia River Gorge, a term which refers to the constriction of the Columbia River as it passes through the Cascade Range. The eastern boundary of the gorge lies in the vicinity of The Dalles, and the western boundary is located just east of the Sandy River, a distance of about sixty miles. Most of the archaeological research in this area has been undertaken in conjunction with the construction of Bonneville Dam.
The earliest archaeological fieldwork in the Bonneville Dam Reservoir area was conducted by Herbert W. Krieger, Curator of Ethnology at the U.S. National Museum. Krieger conducted excavations at a number of archaeological sites along the Columbia River in the area from Prindle, Washington to The Dalles, Oregon. Unfortunately, Krieger produced only one brief two-page publication on his activities during this project (Krieger 1938). However, valuable information on this early archaeological research has been assembled by Phebus (1978), who reconstructed Krieger's activities and published a catalogue of the cultural materials from the area, which Krieger had deposited in the U.S. National Museum.

At the same time Krieger was working in the area, a small field crew under the direction of L. S. Cressman of the University of Oregon conducted excavations on Bradford Island within the Bonneville Dam project area. The results of this fieldwork have never been formally written up, but Cole (Cole and Southard 1971; Cole 1973) has provided a brief description of the project.

The next archaeological fieldwork in the Bonneville Dam Reservoir area was not conducted until 1971, when a survey was undertaken for archaeological sites that would be affected by raising the level of the pool (Cole and Southard 1971). In 1972, fieldwork was conducted at four sites threatened by this increase in pool level (Cole 1974).

University of Washington archaeologists have also excavated sites to be affected by the remodeling of Bonneville Dam (Dunnell and Lewarch 1974a, 1974b; Lewarch and Reynolds 1975; Dunnell et al. 1978a, 1978b; Dunnell and Campbell 1977; Dunnell and Whitlam 1977).

The Portland-Vancouver area downstream from the Columbia Gorge has also been the scene of archaeological research by the University of Washington (Bryan 1957; 1958; Tuhy and Bryan 1958-59; Warren 1958-59; 1960; Dunnell et al. 1973; Jernann et al. 1975). Additional archaeological research in this area includes an analysis of projectile points from sites on Sauvie's Island (Brown 1960), and a doctoral dissertation by Pettigrew (1977) in which a cultural sequence for the Lower Columbia River is proposed.

Archaeological investigations in the area between Portland and the mouth of the Columbia River have lagged considerably behind those in other portions of the valley. At the present time, archaeological research has been reported at only four localities: on the Washington side of the river at Fort Columbia (Kied 1967), the Bay View Site (Gehr 1976), and the Skamokawa Site (Minor 1978); and on the Oregon side of the Columbia River at the Trojan Site (Warner and Warner 1975).

The long history of archaeological research in the Lower Columbia Valley has resulted in the realization that there was a very long, continuous, and intensive aboriginal occupation of the area. Two culture-historical frameworks have been proposed for ordering the archaeological record in the Lower Columbia Valley. The first sequence, proposed by Cressman et al. (1960), is most significant for the information it provides concerning early Columbia River cultures. The second sequence, proposed by Pettigrew (1977), provides a framework for ordering the last 2600 years of Lower Columbia prehistory.

Cultural Sequence at The Dalles

The first culture-historical sequence for the Lower Columbia region was based primarily on the results of excavations at the Five Mile Rapids Site (WS-4) and the Big Eddy Site (WS-1) at The Dalles (Cressman et al. 1960). This sequence consists of three main stages: Early, Transitional, and Late (see Table 3).

The Early Stage has three subdivisions. The Initial Early is characterized by a limited artifact inventory, both in numbers and variety of artifacts found. Blades, scrapers, and a few bone tools comprise the entire assemblage. The Full Early is characterized by a rich bone and antler industry, burins, bolas, blades, enormous numbers of salmon vertebrae, bird and animal bones, and projectile points representative of early styles. The Final Early sees a gradual decline and disappearance of the bird, mammal and fish bones, burins, and bolas. A radiocarbon date of 9785±220 years B.P. (Before Present) was obtained from charcoal gathered from throughout the earliest stratum of the cultural deposit, providing a general idea of the antiquity of the Early Stage at The Dalles.

The Transitional Stage is characterized by an assemblage consisting of only a few projectile points and some non-diagnostic artifacts such as choppers and scrapers. This stage appears to be a time of light occupation in comparison with the Full Early. The Transitional Stage is bracketed by radiocarbon dates of 7875±100 years B.P. and 6090±80 years B.P.
TABLE 3
Cultural Sequence at The Dalles (After Cressman et al. 1960)

<table>
<thead>
<tr>
<th>Stage/Substage</th>
<th>Major Diagnostic features</th>
<th>Temporal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Late Stage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact-Historic</td>
<td>Historic trade materials</td>
<td></td>
</tr>
<tr>
<td>Full Protohistoric</td>
<td>Wide variety of point styles, carved mortars, carved pestles, bone carving, charm stones, choppers, concave scrapers, beads, drills, notched sinkers, stone sculpture</td>
<td>6090 B.P. - Historic Contact</td>
</tr>
<tr>
<td>Initial Protohistoric</td>
<td>Increased use of area, appearance of new projectile point styles</td>
<td></td>
</tr>
<tr>
<td><strong>Transitional Stage</strong></td>
<td>Light occupation of area, small artifact assemblage, projectile points, choppers, scrapers</td>
<td>7875 B.P. - 6090 B.P.</td>
</tr>
<tr>
<td><strong>Early Stage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Early</td>
<td>Decline and disappearance of bone and antler industry, disappearance of bird, animal and fish bones, burins, and bolas</td>
<td></td>
</tr>
<tr>
<td>Full Early</td>
<td>Rich bone and antler industry, burins, bolas, blades, enormous numbers of salmon vertebra, bird and animal bones, red ochre, early projectile point styles (non-stemmed or constricted, tapering stem varieties)</td>
<td>9785 B.P.* - 7875 B.P.</td>
</tr>
<tr>
<td>Initial Early</td>
<td>Limited artifact inventory, blades, scrapers, and bone tools</td>
<td></td>
</tr>
</tbody>
</table>

*First occupation estimated to be as early as 11,000 B.P. (Cressman et al. 1960:66).

The Late Stage begins after 6090 B.P. and extends into historic times; this stage also has three subdivisions. The Initial Protohistoric is characterized by increased use of the area and the appearance of new projectile point styles. The Full Protohistoric is characterized by a wide variety of projectile points, carved stone, carved bone, pipes, ornaments, and other items. The Contact-Historic is characterized by the inventory of the Full Protohistoric plus Euro-American trade materials, especially copper items in the form of beads, iron knives, firearms, hatchets; and other articles such as fishhooks, strike-a-lights, and gun flints.

The archaeological evidence from the Fivemile Rapids and Big Eddy Sites offers the best known record of early Columbia River cultures, demonstrating that a riverine adaptation built around salmon fishing began very early at The Dalles. It has been suggested that the Initial Early occupation may date from as early as 11,000 years ago. The Transitional Stage and the beginning of the Late Stage are considered contemporary with the Altithermal climatic interval (referred to as the Hypsithermal in this study), a period of drying and warming climate which may have caused population movements out of more arid regions toward stabilized water and food supplies. The cultural efflorescence which occurred during the Late Stage, as seen in the increased use of the site and the proliferation of artifact types, is attributed to stimulation from outside influences, the results of either contact with or in-migration of new aboriginal populations (Cressman et al. 1960:65-70).

Cultural Sequence in the Portland Basin

The cultural sequence proposed by Pettigrew (1977) is based on the results of excavations at seven sites in the Portland basin; these sites were firmly dated with the aid of more than twenty radiocarbon dates. The sequence consists of two main phases, the later of which is divided into three subphases (see Table 4).
<table>
<thead>
<tr>
<th>Phase/Sub-phase</th>
<th>Major Diagnostic Features</th>
<th>Estimated Temporal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multnomah Phase</td>
<td>Smaller, narrow-necked point Types 7-16 predominate</td>
<td>A.D. 200-1835</td>
</tr>
<tr>
<td></td>
<td>Chord length of Type 5 uniface edge ('end scrapers') more frequently in smaller mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nule-ear Knives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-handled Heavy Percussors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clay Figurines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incised Clay Tablets</td>
<td></td>
</tr>
<tr>
<td>Multnomah 3 Sub-phase</td>
<td>Historic Trade Goods</td>
<td>A.D. 1750-1835</td>
</tr>
<tr>
<td></td>
<td>Copper Tubes</td>
<td></td>
</tr>
<tr>
<td>Multnomah 2 Sub-phase</td>
<td>Presence of point Types 12, 13 and 15 Point Type 9 more frequent than Type 7</td>
<td>A.D. 1250-1750</td>
</tr>
<tr>
<td></td>
<td>Perforated Netsinkers</td>
<td></td>
</tr>
<tr>
<td>Multnomah 1 Sub-phase</td>
<td>Point Types 7-10 predominate</td>
<td>A.D. 200-1250</td>
</tr>
<tr>
<td></td>
<td>Point Type 7 more frequent than Type 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Notched Netsinkers</td>
<td></td>
</tr>
<tr>
<td>Merrybell Phase</td>
<td>Larger, broad-necked Point Types 1-5 predominate</td>
<td>600 B.C.-A.D. 200</td>
</tr>
<tr>
<td></td>
<td>Chord length of Type 5 uniface edge ('end scrapers') more frequently in larger mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stemmed Drills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flaked cylindrical bi-points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flaked crescents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graphite</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perforated ground stone pendants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peripherally flaked pebbles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altat weights</td>
<td></td>
</tr>
</tbody>
</table>

The Merrybell Phase, estimated to date from 600 B.C. to A.D. 200, is characterized by the following diagnostic artifacts (see Figure 3): large, broad-necked projectile points, stemmed drills, flaked cylindrical bi-points, flaked crescents, perforated ground stone pendants, peripherally flaked pebbles, and altat weights. Graphite is found in archaeological contexts only during this phase.

The subsequent Multnomah Phase, estimated to date from A.D. 200 to A.D. 1835, is divided into three sub-phases—the earlier two on the basis of differing frequencies of diagnostic artifact types and the third on the presence of historic Euro-American trade goods. As a whole, the Multnomah Phase is characterized by a low proportion of broad-necked projectile points and a high proportion of narrow-necked points. Artifacts particularly diagnostic of this phase include nule-ear knives, self-handled heavy percussors, clay figurines, and incised clay tablets (see Figure 4).

The Multnomah 1 sub-phase is characterized by a high proportion of narrow-necked, stemmed projectile points. Of particular importance is the ratio between the frequencies of Type 7 and Type 9 projectile points; in this sub-phase Type 7 is more frequent than Type B. The relative proportion of notched netsinkers to perforated netsinkers is also diagnostic, as perforated specimens are quite rare and notched netsinkers are quite common in this sub-phase.

A major chronological marker which forms the temporal boundary between the Multnomah 1 sub-phase and the Multnomah 2 sub-phase is the Cascade Landslide Flood of A.D. 1250. The Cascade Landslide created a temporary earthen dam near the present site of Bonneville Dam in the Columbia Gorge which impounded the waters of the Columbia River. When the dam broke, it caused a catastrophic flood which presumably destroyed many aboriginal settlements and may have caused major changes in the topography of river channels and land surfaces. As a
Figure 3. Artifacts characteristic of the Merrybell Phase on the Lower Columbia River (from Pettigrew 1977). a, Type 1 projectile point; b, Type 2 projectile point; c, Type 3 projectile point; d, Type 4 projectile point; e, Type 5 projectile point; f, stemmed drill; g, flaked cylindrical bipoint; h, flaked crescent; i, perforated ground stone pendant; j, peripherally flaked pebble; and k, atlatl weight.
result, it may have been necessary for the aboriginal inhabitants of the area to re-establish villages on new sites, in response to shifted salmon migration routes and changes in river and slough channels used for transportation (Pettigrew 1977:329).

The subsequent Multnomah 2 sub-phase, estimated to date from A.D. 1250 to 1750, is characterized by the same types of projectile points as in the previous sub-phase, plus the addition of Types 12, 13, and 15. Also, the relative proportions of Type 7 and Type 9 points are reversed during the Multnomah 2 sub-phase: now Type 9 becomes more frequent than Type 7. Also in this sub-phase, perforated netsinkers become more frequent than previously, and notched netsinkers become correspondingly very rare.

The Multnomah 3 sub-phase, estimated to date from A.D. 1750 to 1835, is distinguished from the previous sub-phase only by the presence of copper tubes and other historic trade goods. This sub-phase represents the period of contact between aboriginal and Euro-American cultures, and ends with the abandonment of the aboriginal way of life.

The impression given by the cultural sequence in the Portland Basin as defined by Pettigrew (1977) is that, although changes occurred in artifact styles over time, in general a cultural continuum seems indicated. There is no evidence in the archaeological record reflecting population replacements as a result of migrations, or any major changes in the lifeways of the prehistoric peoples inhabiting the area. According to Pettigrew (1977:369), the way of life followed by the ethnographic Chinook has apparently been practiced in the Portland Basin for at least the last 2600 years.

A detailed comparison of artifacts from The Dalles area and the Portland Basin indicates a strong similarity in the material culture from the two localities (Pettigrew 1977:341-351). The archaeological evidence seems to suggest that culture change took place in both areas at approximately the same time. The Berrybell and Multnomah Phases, as defined and dated by Pettigrew (1977), fall within the same time frame as the Full Protohistoric and Contact-Historic sub-stages in The Dalles area (Cressman et al. 1960). While the exact correlation of the two cultural sequences will require the collection of additional data, together they provide a fairly complementary culture-historical framework for ordering the last 10,000 years or so of Lower Columbia Valley prehistory.

WILLAMETTE VALLEY PREHISTORY

The Willamette Valley of Oregon is a distinct physiographic province which is bounded on the north by the Columbia River, on the south by the Calapooya Mountains, on the east by the Cascade Range, and on the west by the Coast Range. The principal hydrographic feature is the Willamette River, which flows northward in a meandering channel from its source in the Calapooya Mountains to its confluence with the Columbia River at Portland.

In aboriginal times the Willamette Valley was divided into two separate cultural sub-areas. The Lower Willamette Valley, lying between the Columbia River on the north and Willamette Falls at the present town of Oregon City on the south, was occupied by various bands of Chinookan-speaking peoples. The Upper Willamette Valley, extending from Willamette Falls on the north to the Calapooya Mountains on the south, was inhabited by peoples speaking various dialects of the Kalapuyan language.

The occurrence of the falls in the Willamette River seems to have played a key role in the formation of the different cultural adaptations characteristic of the Chinookan and Kalapuyan populations inhabiting the Willamette Valley. Although the exact extent of their effect is unclear, these falls apparently formed a substantial barrier to the upstream migration of anadromous fish (for a discussion of this issue, see Zenk 1976:69-74). The Chinookan bands living below the falls enjoyed relatively easy access to salmon resources, a situation which permitted them to reside in large semipermanent villages and to develop a society which was internally ranked. The Kalapuyan groups living above the falls, on the other hand, were largely denied access to the salmon "harvests" so important in the economies of other native peoples in the Pacific Northwest. As a result, Kalapuyan subsistence depended more heavily on hunting and gathering than on fishing (see Zenk 1976:30-37). This situation in turn necessitated settlements of less permanence, and produced a society less rigorously ranked, than that of the neighboring Chinookans (Jacobs et al. 1945).

History of Archaeological Research

The first research by professional archaeologists in the Willamette Valley was carried out in the mid-1920s by Strong, Schenck, and Steward (1930), who conducted excavations at a
Figure 4. Artifacts characteristic of the Multnomah Phase on the Lower Columbia River (from Pettigrew 1977).  

a, Type 7 projectile point; b, Type 9 projectile point; c, Type 12 projectile point; d, Type 13 projectile point; e, Type 15 projectile point; f, mule-ear knife; g, clay figurine; h, incised clay tablet; i, notched netsinker; j, perforated netsinker; and k, self-handled heavy percussor. Artifacts j and k are slightly reduced in size.
number of sites at the confluence of the Calapooia and Willamette Rivers near Albany. A few years later in 1933, Cressman, Derreman, and Stafford undertook excavations at two sites, the Virgin Ranch (sometimes known as the Franklin Site) and Smithfield (sometimes known as the Alvadore Site) middens, situated along the banks of the Long Tom River near Franklin. The results of the fieldwork at these two sites were reported by Collins (1951).

The decade of the 1940s saw an increase in the tempo of archaeological research in the Willamette Valley. In 1941 the results of fieldwork at four sites were published; these sites included the Harrisburg (sometimes known as the Spurland Mound) and Miller Mounds on Little Muddy Creek near Harrisburg, and the Halsey and Shedud Mounds on the Calapooia River near the towns of Halsey and Shedud (Laughlin 1941). Also in the same year, Cressman and Laughlin (1941) described the possible association of artifacts with mammoth remains at a locality near Lebanon. Two years later, the results of archaeological fieldwork at the Fuller and Fanning Mounds on the Yamhill River near McMinnville were reported (Laughlin 1943; also see Murdy and Wentz 1975; Woodward et al. 1975). In 1947 another possible association of artifacts with mammoth remains, this time at a locality near Templeton, was described by Cressman (1947). Limited excavations were conducted shortly thereafter in 1949 at a site on Perkins' Peninsula in the area of the Fern Ridge Dam Reservoir on the Long Tom River (Collins 1951:62). In 1949-1950 further excavations were also conducted at the Spurland Mound by Laughlin and Collins (Collins 1951:61).

Two years later, Collins (1951) re-examined and summarized all the archaeological evidence from the valley that had been collected up to that time, compared this with the scanty ethnographic information available, and discussed the cultural position of the historic Kalapuyan Indians in relation to other aboriginal peoples in the Pacific Northwest. As a result of a comparison of the material culture of the Kalapuya with that of neighboring groups, it was concluded that the Kalapuya were most closely related to the peoples of the Columbia Plateau (Collins 1951:139-146). Collins' conclusion is significant in that other anthropologists, notably Kroeber (1939:28), had assigned the Kalapuya to the Northwest Coast Culture Area. The fact that the Kalapuya and their ancestors were an interior, riverine-oriented people with cultural affiliations toward the Columbia Plateau peoples rather than with the marine-oriented inhabitants of the Northwest Coast has been substantiated by subsequent archaeological and ethnographic research.

The next archaeological research in the Willamette Valley was not conducted until the mid-1960s, when a series of archaeological salvage projects were begun which were funded by the National Park Service. In 1966 fieldwork was undertaken in the area to be flooded by Cascadia Dam on the South Santiam River. This project included the excavation of Cascadia Cove, which proved to be one of the earliest sites in the Willamette Valley (Newman 1966; also see Davis 1973). In 1964-1965 archaeological salvage fieldwork was conducted in the Fall Creek Dam Reservoir area in the Upper Willamette Valley (Cole 1968). Also in 1965, and again in 1969, archaeological survey and excavation projects were undertaken in the area to be inundated by Scoggins Creek Reservoir in Washington County (Cole and Rice 1965; Davis 1970a). In 1970-1971 salvage excavations were conducted at sites along Little Muddy Creek north of Harrisburg which were threatened by flood control measures (Davis 1970b; Ohm and Reagan 1971). A description and comparison of two of the more extensively excavated sites, Little Muddy Creek and Lynch Site, was presented by Davis et al. (1973). Most recently, in 1975 an archaeological survey and testing project was conducted in the area of the proposed Gaston Reservoir in Washington County (Decker and Davis 1976).

In 1965 the University of Oregon initiated an on-going archaeological field school program in the Upper Willamette Valley. To date, excavations have been conducted at nine sites: the Lingo Site (Cordell 1967, 1975), three Benjamin Sites (Miller 1970, 1975; Dodge 1978), the Hurst Site (White 1974, 1975a), the Lynch Site (Davis et al. 1973; Sanford 1975), the Beebe Site (Follansbee 1975), the Flanagan Site (Minor and Toepel 1979), and the Halverson Site (Minor and Toepel 1980).

Additional archaeological excavation projects conducted in the Upper Willamette Valley in recent years include fieldwork at the Indian Ridge Site (Hemm 1975) and Baby Rock shelter (Olsen 1975) in the Western Cascades; the description and comparison of two sites, the Simms Site located in the extreme upper Willamette Valley and the Skulaw Falls Site in the Coast Range to the west (Pettigrew 1975); and archaeological salvage excavations in advance of highway construction at two sites on the Willamette Valley floodplain near Salem (Pettigrew 1980).

In contrast to the Upper Willamette Valley, relatively little archaeological research has been conducted in the area below Willamette Falls. An ethnohistoric study of the Clackamas band of Chinook Indians who inhabited portions of the Lower Willamette Valley also included information from archaeological contexts (Woodward 1974). One of these localities, the Geertz Site, contained an artifact assemblage which on stylistic grounds
makes this one of the earliest sites so far reported in the Willamette Valley (Woodward 1972). Another locality investigated was an historic Clackamas Indian cemetery which contained trade items indicating its use during the period from 1830 to 1835 (Woodward 1977). An important study of archaeological remains from the area around Willamette Falls has also been conducted, documenting the existence of a major prehistoric salmon fishery at this strategic location between A.D. 200 and A.D. 1750 (Kent 1978).

The Upper Willamette Valley Chronology

As a result of the archaeological projects that have been conducted in the Willamette Valley, the general outline of the region's prehistory is relatively well known. A proposed chronological framework consisting of five periods of occupation has been defined by White (1974, 1975b, 1979) as the basis for ordering the archaeological record in the Willamette Valley. In the following summary, each period will be briefly described in terms of cultural content and chronology. The principal archaeological traits associated with each of the five cultural periods are summarized in Table 5.

**TABLE 5**
Archaeological Traits Associated with Chronological Periods in the Upper Willamette Valley (from White 1975b)

<table>
<thead>
<tr>
<th>PERIOD I</th>
<th>6000 (?) - 6000 B.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Early point types such as Sandia and Yuma (?)</td>
<td></td>
</tr>
<tr>
<td>2. Crude stone tools</td>
<td></td>
</tr>
<tr>
<td>3. Associated extinct mammals</td>
<td></td>
</tr>
<tr>
<td>4. Isolated finds</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIOD II</th>
<th>6000 - 4000 B.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Point types 4a and 4b are the only point types</td>
<td></td>
</tr>
<tr>
<td>2. Crude scrapers on random flakes</td>
<td></td>
</tr>
<tr>
<td>3. Edge ground cobbles</td>
<td></td>
</tr>
<tr>
<td>4. Short lanceolate blades</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIOD III</th>
<th>4000 - 250 B.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Large, thick points: Types 3a, 12, 13, 14a, 14b (often in conjunction with types 4a and 4b)</td>
<td></td>
</tr>
<tr>
<td>2. Fewer artifacts and types of artifacts</td>
<td></td>
</tr>
<tr>
<td>3. Less specialized tools</td>
<td></td>
</tr>
<tr>
<td>4. Small camas ovens (less than 1 meter in diameter)</td>
<td></td>
</tr>
<tr>
<td>5. Large pithouses</td>
<td></td>
</tr>
<tr>
<td>6. Cache pits</td>
<td></td>
</tr>
<tr>
<td>7. Absence of bone artifacts</td>
<td></td>
</tr>
<tr>
<td>8. Flexed burials in simple pits</td>
<td></td>
</tr>
<tr>
<td>9. Minimal or no grave goods</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIOD IV</th>
<th>250 B.C. - 1700 A.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Small stemmed point types 2a, 5a, 7a, 7b, 8a, 8b, 9, 10, 11a, 11b, 15, 16, unstemmed types 1a, 1b, 1c, 2b</td>
<td></td>
</tr>
<tr>
<td>2. Deeply serrated points</td>
<td></td>
</tr>
<tr>
<td>3. Scrapers of many types and sizes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIOD IV (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Unifacial and bifacial chopping tools of basalt cobbles</td>
</tr>
<tr>
<td>5. Scaper planes</td>
</tr>
<tr>
<td>6. Spherical net weights</td>
</tr>
<tr>
<td>7. Reamers and perforators</td>
</tr>
<tr>
<td>8. Core and flake spokeshaves</td>
</tr>
<tr>
<td>9. Large camas ovens</td>
</tr>
<tr>
<td>10. Phallic pestles</td>
</tr>
<tr>
<td>11. Antler camas digging stick handles</td>
</tr>
<tr>
<td>12. Antler and bone flakers</td>
</tr>
<tr>
<td>13. Antler ear plugs</td>
</tr>
<tr>
<td>14. Antler fleshing tools</td>
</tr>
<tr>
<td>15. Bone harpoon beads</td>
</tr>
<tr>
<td>16. Bone projectile points</td>
</tr>
<tr>
<td>17. Ensilform whalebone clubs</td>
</tr>
<tr>
<td>18. Tubular bone beads</td>
</tr>
<tr>
<td>19. Bone pendants</td>
</tr>
<tr>
<td>20. Disc beads</td>
</tr>
<tr>
<td>21. Whole shell beads and lopped olivella</td>
</tr>
<tr>
<td>22. Abalone pendants</td>
</tr>
<tr>
<td>23. Denta</td>
</tr>
</tbody>
</table>
Period I (8000 - 6000 B.C.)

The earliest suggestions for the presence of aboriginal peoples in the Willamette Valley have been found at localities near the towns of Lebanon (Cressman and Laughlin 1941) and Tangent (Cressman 1947), and at a third locality in the tributary Mohawk River Valley (Alley 1975).

Near Lebanon, Cressman and Laughlin (1941) reported the finding of a possible stone tool and a small bone chisel in association with fossilized mammoth bones. Since mammoth became extinct in North America some 10,000 or more years ago, the discovery of artifacts in association with their remains suggests a considerable antiquity for the presence of aboriginal peoples in the area. However, subsequent thin-section analysis of the bone chisel, undertaken to determine the nature of the soil deposited in its exposed cellular structure, indicated that the tool came from the top brown bed (upper 48 centimeters) of the deposit, while the mammoth remains were confined to an underlying bluish clay stratum. Thus the bone chisel was not directly associated with the mammoth remains (Cressman and Laughlin 1941:340). On the other hand, the possible stone tool was definitely found imbedded in the blue clay, and therefore its association with the mammoth remains was accepted as valid by Cressman and Laughlin (1941:342). However, other archaeologists, notably Whitehead (1970-72), have noted that the stone is only minimally modified, and have questioned whether it is even a bona fide artifact at all.

A possible association of artifacts with mammoth remains was also reported just 18 miles away near the town of Tangent (Cressman 1947). At this locality, two lanceolate projectile points were allegedly found in the sidewall of a drainage slough along with several mammoth vertebrae, a tooth, and part of a tusk. Unfortunately, the association of these artifacts with the mammoth remains is essentially hearsay, since they were originally discovered in 1895 by an amateur fossil hunter but not reported until a half-century later. Thus, again there is no assurance that the projectile points date from the same time period as the bones. The projectile points, however, do appear to be early types. They are large lanceolate spear heads resembling the Eden and Scottsbluff points which occur on the Great Plains at sites radiocarbon dated between 9000 and 7000 B.P. (Wormington 1964:106).

The best evidence so far available for the earliest aboriginal occupation of the Willamette Valley was the finding of a classic Clovis fluted projectile point in 1959. The specimen was recovered from the surface of gravels deposited by the Mohawk River (a tributary of the McKenzie River), approximately five miles northeast of Springfield in the Upper Willamette Valley (Alley 1975). The artifact had been rolled and abraded, apparently as a result of postdepositional processes. Clovis points have previously been found in the Pacific Northwest (Osborne 1956), but always, as in this case, in undatable surface contexts. These finds are nevertheless significant because Clovis fluted points from radiocarbon dated sites on the Great Plains and in the Southwest all range in age between 11,000 and 11,500 years old (Haynes 1969). Furthermore, when found in buried contexts these distinctively Clovis artifacts are often in association with the bones of the bones of mammoth. In the absence of more direct dating information on the age of Clovis projectile points in the Pacific Northwest, this same time range may reasonably be applied to the northwestern specimens as well.

The actual dates of this earliest period of aboriginal occupation in the Willamette Valley obviously are not very secure. From an analysis of pollen types associated with mammoth remains found near Silverton (no artifacts were associated), Hansen and Packard (1943:467) have shown that mammoths were present in the Willamette Valley when environmental conditions were cooler and moister than they are at present, probably around 10,000 years ago during a late Pleistocene climatic interval. White (1975:56) originally suggested a date of 10,000 B.P. for the beginning of Period I, but in view of the finding of a Clovis fluted projectile point, the actual date for the initial entry of aboriginal populations into the Willamette Valley may have been considerably earlier. An ending date of approximately 8000 B.P. for this earliest period is suggested, largely on the basis of cross-dating between later archaeological manifestations in the Willamette Valley and prehistoric cultural complexes defined elsewhere in the Pacific Northwest.

Period II (6000 - 4000 B.C.)

Period II in Willamette Valley prehistory is currently defined on the basis of information from only three sites: Cascadia Cave (Newman 1966), the Geertz Site (Woodward 1972), and Baby Rockshelter (Olsen 1975). All three of these sites are located on the eastern periphery of the Willamette Valley in the foothills of the Western Cascades.
The initial occupation at Cascadia Cave, located on the South Santiam River, is radiocarbon dated at 7910±280 B.P. (Newman 1966:23). The upper levels of the cave had been badly disturbed by relic hunters, and detailed stratigraphic data on the distribution of the approximately 400 artifacts recovered were not contained in the excavation report. The report does indicate, however, that large leaf-shaped projectile points (often referred to as "Cascade points") were the only type represented in the lower 90 centimeters of the deposit. In the upper levels of the cave, thick side-notched projectile points were found with the leaf-shaped specimens. The introduction of the earliest large side-notched points in the Pacific Northwest is placed between 6000 and 7000 years ago based on their radiocarbon dated occurrence at Cascadia Cave and elsewhere (Newman 1966:25; Nelson 1969:26-27). In addition to projectile points, large ovate knives, end and side scrapers, and modified flakes were found in large numbers in Cascadia Cave. Also included in the assemblage were drills, manos and metates, and edge ground cobbles. No modified bone tools were found, but two antler tines had apparently been used for knapping flaked stone tools.

Animals hunted by the inhabitants of Cascadia Cave included deer, elk, marmots, rabbits, weasels, and an unidentified species of bird, (possibly grouse). Nearly all of the long bones from deer and elk exhibited split ends, probably the result of attempts to extract marrow. The only floral remains recovered from Cascadia Cave were fragments of hazelnuts, which were found in the upper half of the cultural deposit. In view of the proximity of the site to the South Santiam River, the fact that fish remains were not found in Cascadia Cave is somewhat surprising. The absence of fish bones, as well as any fishing equipment, at the site appears to support the idea that in prehistoric times the Willamette Falls may have been a substantial barrier to the upstream migration of anadromous fish, and that this resource was not available to aboriginal peoples living in the Upper Willamette Valley (Newman 1966:27).

Judging from the nature of the faunal and floral remains, Cascadia Cave appears to have been occupied on a seasonal basis, probably during the spring and summer. The utilization of Cascadia Cave as a base for hunting and gathering activities is believed to have continued until approximately 3000 B.P. (Newman 1966:31).

A second locality occupied during Period II is the Geertz Site, situated in the foothills of the Cascade Range some 20 miles southeast of Portland (Woodward 1972). At this site, stone flaking debris and artifacts were scattered over an area some five acres in extent; however, the cultural deposit is very shallow, less than 20 inches in depth. Several hundred artifacts were recovered during fieldwork at the Geertz Site, including 54 projectile points. Thirty-seven points were sufficiently complete to classify, and all were of the large, leaf-shaped Cascade type. An estimate between 6000 and 8000 B.P. for the occupation of this site seems justified, based on Newman's (1966:25) observation that at Cascadia Cave large leaf-shaped points were the only type represented until around 6000 years ago. The Geertz Site appears to have been a focus for hunting activities, as a large amount of stone-working debris and numerous incising, perforating, and scraping tools were found. Many of the tools were milling stones, tools which are commonly associated with the utilization of hard seeds and nuts.

Baby Rockshelter, located near the town of Oakridge in the lower elevations of the Western Cascades, is the third site known to have been occupied during Period II (Olsen 1976). The upper levels of the cultural deposit had been disturbed by relic collectors, but the lower levels were still largely intact. Of particular importance was the discovery of a layer of volcanic ash near the bottom of the cultural deposit. Analysis of this ash indicated that it had been ejected by the eruption of Mount Mazama at the present location of Crater Lake, an event which has been firmly dated at 7000 years ago (Kittelman 1973). Since a small number of artifacts were recovered below the volcanic ash layer, it is clear that the initial occupation of the rockshelter took place prior to that time.

The artifact assemblage from Baby Rockshelter is fairly small, owing partly to the previous disturbance of the site by relic collectors, and partly to the fact that only limited excavations were conducted there. The artifact collection suggests that Baby Rockshelter was primarily used as a hunting camp, as projectile points, end and side scrapers, bifaces, and gravers were the most common artifacts recovered. Milling stones were also reportedly found at this site, although they apparently formed only a minor part of the total artifact assemblage.

The artifact assemblages from the archaeological sites in the Willamette Valley occupied during Period II compare closely with those from contemporary early cultures found elsewhere in the Pacific Northwest which have been assigned to the "Cascade Phase" (Leonhardt and Rice 1970; Bense 1972). These assemblages seem to indicate a subsistence pattern with a primary emphasis on the hunting of large game animals, supplemented by some seasonal plant collecting and hunting of smaller mammals and fowl. Judging from the evidence (or lack of it) so far available, fishing apparently was only a minor economic
activity, except perhaps at certain key locations such as The Dalles of the Columbia River (Cressman et al. 1960). The Period II assemblages from the Willamette Valley, however, lack a number of traits found at contemporary sites elsewhere. For example, atlatl weights and Oliviella shell beads have not been found, and bone artifacts, plentiful in assemblages elsewhere dating from this early time, are very rare in Willamette Valley sites. Subsistence practices also appear to have been slightly different, in that there is no evidence for fishing or the utilization of river mussels for food by the inhabitants of the Willamette Valley during this period.

Period III (4000 B.C. - 250 B.C.)

At the present time Period III is primarily defined on the basis of information from the lower components at three archaeological sites on the Willamette River floodplain: the Lingo (Cordell 1967, 1975), Benjamin 1 (Miller 1970, 1975), and Hurd Sites (White 1974, 1975a). The middle component at Baby Rockshelter (Olsen 1975) and some of the sites investigated in the Fall Creek Dam Reservoir area (Cole 1968) were also probably occupied during this period.

During Period III the large leaf-shaped and side-notched projectile points characteristic of the preceding period are largely replaced by a variety of smaller corner-, side-, and base-notched points. Also common during Period III are large basalt bifaces and crude scrapers and chopping tools.

The earliest dated cultural feature from a locality on the Willamette Valley floodplain is Luckiamute Hearth, with a radiocarbon date of 5250±270 B.P. (Reckendorf and Parsons 1966). The hearth was exposed by soil scientists in the bank of the Luckiamute River a few miles from its confluence with the Willamette River. No artifacts were found in association with the hearth, but five charred acorns were recovered. Significantly, this earliest evidence for the utilization of acorns coincides with the period of warmer and drier climatic conditions known as the Hypsithermal (Heusser 1960:184), during which time oak trees were at their maximum distribution in the Willamette Valley (Hansen 1947; Detling 1968).

At the Hurd Site, evidence of a habitation structure--postholes, a central hearth, and a possible cache pit--was discovered which apparently had been occupied during Period III (White 1975a:148-161). No artifacts were found within the structure, but the earliest radiocarbon dates from the Hurd Site, averaging approximately 2800 B.P., were associated with this feature.

Period III is also the earliest time for which there is some information available on mortuary practices. Five burials recovered from the lower levels of the Lingo Site can be attributed to this period. All five burials were flexed inhumations with heads oriented to the west in simple pits. Only one of the burials had grave goods, which consisted of a pendant and a bone mandible found near the pelvic region and a fragment of a marine shell pendant near the ribs (Cordell 1975:284). A radiocarbon date of 4230±110 B.P. was obtained from a firepit in one of the lowermost levels at the Lingo Site (Cordell 1975:278), providing a rough estimate of the age of the burials found there.

Midway through Period III the transition began from the warmer and drier Hypsithermal interval to the cooler and moister climate currently characteristic of the Willamette Valley. Coinciding with this change in climate was a reduction in the extent of oak forest in the valley, and a resurgence of coniferous trees, leading to the vegetation patterns observed in early historic times. The earliest evidence for the utilization of camas, known to have been a staple of the historic Kalapuya Indians of the area, is found during this time. A radiocarbon date of 2320±80 B.P. was obtained from carbonized camas bulbs recovered from a firepit in the lower levels of the Benjamin 1 Site (Miller 1975:321). The evidence for the utilization of acorns and camas indicates that the inhabitants of archaeological sites occupied during Period III had begun by that time to utilize the most important of the economic resources relied on by the historic Kalapuya Indians in the ethnographic period.

Two important archaeological sites near Salem in the northern half of the Willamette Valley with components dating from Period III were excavated during a highway salvage project in 1976 (Pettigrew 1980). The sites, 3SN97 and 3SN99, are located along a former channel of Mill Creek, adjacent to the Interstate 5 freeway. Both sites are situated in open grassland areas within a grove of cottonwood, ash, oak, and willow trees. A general assemblage of cultural materials including projectile points, unifaces, bifaces, drills, hammerstones, a mortar, cores and chipping detritus was obtained from these two sites.
According to the results of nine radiocarbon determinations, Site 35MA7 was occupied on an intermittent basis from around 2000 B.C. up to historic times. Site 35MA9, on the other hand, apparently had two periods of occupation, from 2000 to 1500 B.C. and from A.D. 500 to historic times. Botanical specimens recovered from these two sites includes cotton, bulbs, hazelnuts, and an acorn, which suggest use of these localities during spring through autumn. The relatively small area occupied by these sites suggests that they were utilized by small family-size groups as part of an annual settlement-subistence round.

Period IV (250 B.C. - A.D. 1700)

This is the best known period in Willamette Valley prehistory, as most of the archaeological sites so far excavated contain components that were occupied after approximately 2000 years ago. This period is best defined on the basis of the later components at the Lingo (Cordell 1967, 1975), Benjamin (Miller 1970, 1975), and Hurd Sites (White 1974, 1975a), as well as the precontact occupations of the Fuller and Fanning (Laughlin 1943) and Spurland Mounds (Laughlin 1941).

The artifact types most diagnostic of this period are a variety of small, delicately-made projectile points. Both stemmed and unstemmed forms occur; many of the specimens are deeply serrated. The small size of these projectile points indicates that the bow and arrow had replaced the atlatl and dart as the basic hunting weapon. Also highly characteristic of this period are spokeshaves, reamers, denticulates, a variety of scraper types, and mortars and pestles. Large unifacial and bifacial chopping tools continue to be common. For the first time, artifacts made of bone and antler are recovered in large numbers. Antler artifacts include digging stick handles, flakers, ear plugs, and fleshing tools. Artifacts made from bone include harpoon heads, projectile points, whalebone clubs, tubular and disc beads, and ear and nose plugs.

The faunal remains from archaeological sites occupied during this period indicate that deer, elk, squirrel, beaver, and rabbit were hunted by the aboriginal inhabitants of the region. The abundance of ground stone tools--mortars and pestles--indicates a heavy reliance on floral resources such as nuts and seeds. For the first time there is evidence of fishing by the prehistoric inhabitants of the Upper Willamette Valley. The presence of fish vertebrae and grooved pebbles believed to be net weights or line sinkers at the Fuller and Fanning Sites on the Yamhill River (Laughlin 1943:220) is consistent with the ethnographic reference by Coues (1897:81) that the Yamhill band of the Kalapuya Indians caught salmon in large numbers and prepared them for storage by drying. This suggests that at least some salmon were making it over the Willamette Falls and into the tributaries of the Willamette River. There also is evidence for the first time--though it is scanty--of the utilization of freshwater mussel as a food source (Laughlin 1941:151; 1943:225; Davis et al. 1973:13).

The basic mortuary pattern of flexed inhumations in simple pits observed in Period III continues as the most common method of interment; this general mortuary pattern is seen throughout the Columbia Plateau at this time (Sprague 1971). The inclusion of grave goods becomes more common and more elaborate, suggesting an increased concern with social status among the prehistoric peoples of the Willamette Valley. Among the more common items occurring with burials are marine shell beads, antler wedges, bone awls, and antler digging stick handles. Less commonly found were projectile points, mortars, and pestles. At the Fuller Site, birds and dogs were occasionally interred with the human burials (Laughlin 1943). A single burial at each of the Fuller and Fanning Sites exhibited fronto-occipital deformation of the cranium, a practice highly characteristic of the Chinook Indians who inhabited the area to the north in historic times (Collins 1951:99-100). It is also possible that this trait was associated with a preferred social position (Collins 1951:100). Two instances of atypical mortuary practices have been recorded. At the Lynch Site a mass burial consisting of one primary and three secondary interments was discovered in a bell-shaped pit (Sanford 1975:251). At the Fuller Site, Laughlin (1943:221) recovered a burnt fragment of a human skull. Although Laughlin warns against accepting this as evidence of cremation, this practice was ethnographically documented among the Santiam band of the historic Kalapuya Indians (Jacobs et al. 1945:74).

Coast-Interior trade becomes intensive during Period IV, most of it probably via the Columbia River. The most common trade items were marine shells, including Densalia, Olivella, Littorina, Glycymeris, Pseudopod, Aonae, Paphia staminea, Haliotis, epitonium, and Furtillia. These shells usually occur in the form of necklaces, bracelets, and anklets. Other items associated with this coast-interior trade include whalebone clubs and composite harpoon points. Ceremonial obsidian blades, a single example of which has been found at both the Shedd (Laughlin 1941) and Fuller Mounds (Laughlin 1943), may represent further evidence of trade with the Oregon coast, or contact with aboriginal peoples.
In northern California, these distinctive artifacts were used in a ceremonial complex practiced in ethnographic times by the Hupa, Karok, Yurok, and Wiyot Indians of northern California, as well as some aboriginal groups along the Oregon coast (Collins 1951:115-117). A large sample of these obsidian specimens was recovered from the Gold Hill Burial Site on the Rogue River in southern Oregon (Cressman 1933a, 1933b).

Period IV may be viewed as the culmination of the gradual development of aboriginal culture within the Upper Willamette Valley. There is a more or less continuous occupation of several sites on the Willamette River floodplain from Period III to Period IV, although the later components at these sites differ considerably from the earlier ones. Notably, the later occupations are characterized by a greater frequency of artifacts, and by a wider range of artifact types, than the earlier components. The artifact assemblages from Period IV also contain a higher proportion of specialized tools, such as gravers, reamers, and spokeshaves, than the occupations dating from the previous period. In general, then, the artifact assemblages from Period IV are more elaborate and contain more exotic traits than those from Period III. This distinction seems to be most evident in those sites occupied just prior to Euro-American contact.

The increase in coastal trade which occurs during Period IV may reflect an expansion of Chinook commercial activity at this time up the Columbia River to the vicinity of the Wishram Indians at The Dalles. In this respect it should be noted that the Fuller and Fanning sites on the Umpqua River exhibit much stronger extra-valley affinities than sites located in the Upper Willamette Valley. On the other hand, White (1975b:97-98) suggests that this late spread of Columbia River and coastal traits into the Willamette Valley may have been connected in some way with the influx of Euro-American goods into the Lower Columbia River region, a process which took place within only the last 300 years.

Period V (A.D. 1700 - 1850)

This period includes protohistoric and early historic times in the Upper Willamette Valley. It encompasses the archaeological manifestations of the culture of the Kalapuya Indians from the time of the first European contact until their relegation to reservations in the late 1800s. Period V occupations are represented at only a very few sites: the Fuller and Fanning Mounds (Laughlin 1943), the Harrisburg Mound (Laughlin 1941), the David- son, and the Emma Sites (Davis et al. 1973), Sitka 156118 (White 1975b:73, 107), and the Marke Creek Site (White 1975b:71, 105). The fact that few sites are known to have been occupied during this period is consistent with the brief interval of time involved, and the known decimation of the aboriginal population in the valley as a result of the introduction of European diseases.

Artifacts specifically diagnostic of Period V include European trade goods such as copper ornaments and bracelets, copper tombac buttons, glass trade beads, iron nose plugs, and iron knives. This list includes only items actually reported from archaeological sites.

Seven burials from two Upper Willamette Valley sites can be assigned to Period V because of the presence of historic artifacts among the grave goods. Six of these burials are from the Fuller Mound (Laughlin 1943) and the other is from the Harrisburg Mound (Laughlin 1941). Five of these burials follow the traditional mortuary pattern, with the skeleton flexed and the head oriented to the west. One of the burials, also flexed, had the head oriented to the east; the other burial had been disturbed and its position could not be evaluated. All of the burials were of adults with the exception of a single adolescent female. Four of the seven skeletons (two male and two female) exhibited cranial deformation.

It should be noted that historic materials were associated with only six of the 40 burials recovered from the Fuller Mound, and Laughlin (1943:225) suggests that these burials were intrusive into a midden occupied prior to historic contact. The possibility, although tentative, explanation may be that during the initial period of contact with Euro-Americans (via the Columbia River), items of iron, copper, brass, and glass constituted wealth or prestige goods that become concentrated in the hands of a relatively few individuals of high status (Woodward et al. 1975:402).

The Upper Willamette Valley Subsistence-Settlement System

In 1970 an extensive archaeological reconnaissance of the Upper Willamette Valley resulted in the recording of 96 sites. Information collected during this project, as well as
Figure 5. The Prehistoric Upper Willamette Valley Subsistence-Settlement System (from White 1975b:92).
data from previously recorded sites, was used by White (1974, 1975b) to develop a tentative subsistence-settlement model for aboriginal land-use in the Upper Willamette Valley. Four broad environmental zones were delineated within the valley. It was suggested that sites located in each zone would have been the locus of different subsistence activities occurring at different times of the year (Figure 5).

Valley edge sites are located above 500 feet in elevation on slopes and ridges bordering tributary valleys. They are commonly adjacent to small springs or spring-fed streams. These were probably task-specific sites occupied during late spring through summer. Activities at these sites probably included the hunting of large and small game, hide preparation and processing, tool manufacturing, and food grinding. The principal valley edge sites so far investigated are the Fossil Creek Dam Reservoir sites (Cole 1968), the Sycamore Creek Site (Dodd 1970a), the Beebe Site (Follansbee 1975), and the Halverson Site (Miner and Toepel 1980).

Narrow valley plain sites are generally located on leading edges of low terraces above narrow floodplains bordering high-gradient tributaries. Oak savannas and marshes are the predominant setting. Only two narrow valley plain sites are reported by White (1975b:114-115). Assemblages from these sites also suggest task-specific use. Primary activities carried out at these sites were probably food grinding, small game hunting, and wood working.

Primary flood plain sites are located on the broad, flat flood plain of the Willamette River and are subject to periodic flooding. Many of the archaeological sites so far investigated in the Upper Willamette Valley are of this type, most notably the Lingo Site (Cordell 1967, 1975), the Benjamin Sites (Miller 1970, 1975; Dodge 1975), the Lynch Site (Sanford 1975), and the Hurd Site (White 1974, 1975a). Most of these sites were probably task-specific sites, occupied during the late spring and early summer, but may have been base camps occupied more or less throughout the year. The wide variety of activities that may have been performed at these sites include large and small game hunting, hide preparation and processing, camas gathering and processing, tool manufacture, and wood working.

Riparian sites are adjacent to large perennial tributary streams and are characterized by considerable mound build-up. Vegetation around these sites includes cottonwood, willow, and maple trees. These sites were used as base camps and were occupied more or less throughout the year. The primary activities performed at these sites appear to have been small game hunting and tool manufacture. The Halsey and Shedd Mounds (Laughlin 1941) and the Fuller and Fanning Mounds (Laughlin 1943) are the principal riparian sites where excavations have so far been conducted.

The functional and spatial relationships between sites of the various types are depicted in Figure 5. A subsistence-settlement system consisting of a central base camp surrounded by a series of task-specific sites is suggested. The possibility also exists that some aboriginal groups in the Upper Willamette Valley may not have maintained base camps at all, but simply shifted occupation between task-specific stations throughout the year (White 1975b:94).

Recently, Towle (1979) has suggested additional issues which should be considered in attempts to reconstruct prehistoric subsistence and settlement patterns in the Upper Willamette Valley. Specifically, early maps and historical accounts indicate that an even greater area than previously supposed was covered with oak-savanna vegetation, that this environment was the result of intentional firing by the Kalapuya Indians, and that enormous flocks of migratory waterfowl constituted another significant subsistence resource for the aboriginal population. The considerations put forth by Towle (1979) do not seriously challenge White's (1974, 1975b) general model of subsistence and settlement patterns. Rather, they seem to suggest new interpretations of seasonality of occupation and dominant activities conducted at archaeological sites in the Upper Willamette Valley.

ARCHAEOLOGY OF THE NORTHERN OREGON CASCADE RANGE

Less is known about the prehistory of the Cascade Mountain Range than any other region of comparable size in Oregon. This unfortunate situation is largely due to the fact that the attention of most archaeologists has been directed in the past towards the salvage of archaeological remains threatened by dam and reservoir construction in the river basins adjacent to the mountains. The dense forests and rugged terrain have also tended to discourage archaeological research in the region.

Some information on the nature and variety of archaeological resources found within the higher elevations of the Cascade Range in northern Oregon has been assembled in
Cultural Resource Overviews of the Mt. Hood National Forest (Bryant et al. 1978) and the Willamette National Forest (Minor and Pecor 1977).

To date, excavations have been reported at only a handful of archaeological sites within the northern Cascade Range in Oregon: Cascadia Cave (Newman 1966), the Geertz Site (Woodward 1970), Baby Rockshelter (Olsen 1975), and the Indian Ridge Site (Henner 1975). The first three sites listed above are all located within the lower elevations of the Western Cascades, and were previously described in the section on Period II in Willamette Valley prehistory.

The Indian Ridge Site, located in the McKenzie District of the Willamette National Forest, was tested by archaeologists from the University of Oregon (Henner 1975). This site is an open site situated at an elevation of 4800 feet at the headwaters of Penny Creek, a tributary of the McKenzie River. It reportedly was in use as late as the 1920s by Indians from the Warm Springs Reservation in north-central Oregon, who occupied the site in autumn while collecting huckleberries and hunting deer. The artifacts recovered, particularly the projectile points, flake scrapers, and manos, are consistent with the idea that the Indian Ridge Site was used for these activities during the late prehistoric period as well.

Even though the archaeological record of the northern Cascade Range is not well known at the present time, the evidence available from Cascadia Cave and the other early sites indicates use of the region by prehistoric peoples over a time span of several thousand years. The archaeological remains from the great majority of sites in this upland region seem to indicate temporary, probably seasonal use of these localities by small groups of aboriginal peoples in search of large game, vegetal foods, and other resources. Owing to the lack of detailed archaeological research, however, the origins and cultural affiliations of the aboriginal peoples who inhabited this upland region are largely unknown. Several alternative interpretations of the cultural relationships of the archaeological complexes found in the Cascades have been suggested.

One interpretation is that archaeological sites in the Cascades represent summer high altitude manifestations of Columbia Plateau and/or Great Basin cultures. This view seems to be advocated by Newman (1966:28-31), who sees at least the earlier cultural materials from Cascadia Cave as being most similar to artifacts from these regions. Further support for this view may be found in the presence of Great Basin projectile point types at Baby Rockshelter (Olsen 1975:491), and in Henn’s statement that the Indian Ridge Site was occupied in historic times by Indians from eastern Oregon while collecting huckleberries and hunting deer (Henner 1975:467).

A second possible alternative is that the archaeological complexes found in the Cascades represent high altitude manifestations of prehistoric Willamette Valley cultures. It seems quite likely that aboriginal people followed large game animals, such as deer and elk, from their winter range in the Willamette Valley into their summer range in the Cascades (White 1976:53). The fact that projectile points from the upper levels of Cascadia Cave are stylistically similar to those found in sites located on the Willamette Valley flood plain seems to support this idea (Davis et al. 1973:7), at least during later time periods.

A third alternative is that the archaeological complexes of the Cascades are indigenous to the region and not strongly related to cultures on either side of the Cascade Range. This view is advocated by Grayson (1975) who notes stylistic similarity among artifacts found along the west slope of the Cascades, and dissimilarity between the artifacts found in this area and those found in Willamette Valley flood plain sites. On this basis he proposes that the Western Cascades formed a distinct cultural subarea, separate from the Willamette Valley. Because of heavy snowfall during the winter, however, it seems questionable whether aboriginal hunting and gathering peoples would have remained in the Cascades throughout the year. A move to lower elevations, either to the east or to the west of the Cascade Range, would appear to have been necessary.

A fourth alternative, which seems the most acceptable one on the basis of present evidence, is that both the first and second possibilities discussed above are involved: that the archaeological complexes in the Cascades are high altitude manifestations of both Columbia Plateau/Great Basin and Willamette Valley cultures, probably according to whether the occupations occur predominantly on the eastern or western flanks of the Cascades. This alternative has the advantage of not imposing an either Columbia Plateau/Great Basin or Willamette Valley identification which would clearly be incongruent with the ethnographically known utilization of the Cascades by aboriginal peoples on both sides of the Cascade Range. It must be admitted, however, that this interpretation is founded primarily on logic and evidence from surrounding regions, and at this point gains only equivocal support from actual archaeological evidence within the region of concern itself. The idea thus needs to be tested by future archaeological research.
The northern coast of Oregon is characterized by a diverse physiographic environment. The topography varies from low sand dunes and coastal plateaus to steep and rugged mountains with cliffs which drop off directly into the ocean. Many major and minor streams empty into bays and inlets at regular intervals along the coast. The fact that the mouths of most of the coastal streams are drowned, with tidal action extending for long distances, points to a relative submergence of the coastal margin within the last 6000 years (Baldwin 1945; Lowry and Baldwin 1952; Dicken et al. 1976).

Although Krocher (1936:30) initially assigned the aboriginal cultures of the entire Oregon Coast to the Lower Columbia Culture Area, Drucker (1955a:66) has more accurately observed that these native peoples followed a way of life more closely similar to that practiced in the Northwest Coast Culture Area, which extended from southern Alaska into northwestern California. Furthermore, in his discussion of sub-areas within the larger Northwest Coast Culture Area, Drucker (1955b) has placed the northern and central Oregon coast in the Coast Salish-Chinook Province, and the southern Oregon coast below the Coquille River in the Northwest California Province. Both ethnographic and archaeological data support the idea that the aboriginal cultures inhabiting these different sections of the Oregon coast at the time of historic contact were the end products of somewhat different cultural traditions (cf. Barnett 1937; Newman 1959). The following discussion is concerned primarily with archaeological research along the northern and central Oregon coast, within the Coast Salish-Chinook Province of the Northwest Coast Culture Area.

Archaeological research along the northern Oregon coast began with an extensive survey sponsored by the University of Oregon and carried out by Collins (1953). The survey area extended from the city of Astoria in Clatsop County on the north to Cape Blanco in Curry County on the south. The primary emphasis of this survey was on the location of archaeological sites which could be expected to yield substantial information on the region's prehistory. A total of 133 sites was recorded during this project, of which 35 sites were recommended for further study.

While the survey conducted by Collins contributed little information on the antiquity of prehistoric cultures on the Oregon coast, nevertheless, it did result in the accumulation of a considerable amount of data on the nature of aboriginal settlement in this coastal region. The majority of the archaeological sites recorded during this project are located along or near water courses and are accessible to the ocean. A regular pattern of aboriginal occupation along each side of river and stream mouths and on many of the sand spits in coastal bays is consistent in this coastal zone (Collins 1953:50). The results of a more recent survey for archaeological sites on State Park lands along the Oregon coast by Ross (1976) have tended to support the initial statements about aboriginal settlement in this region first made by Collins (1953).

Based on both the relatively scant ethnographic information on aboriginal peoples who inhabited the coastal region, as well as on data obtained from archaeological research, Ross (1976) have proposed a tentative model for aboriginal settlement along the Oregon coast. This model presumes movement by the aboriginal population from season to season in order to maximize the availability of food resources.

During the fall and winter months, the majority of the population would be settled in permanent villages around estuaries and along the banks of the main coastal rivers up as far as tidewater. These settlements were situated at locations where the fall runs of anadromous fish could be harvested. The location of these settlements on coastal rivers also meant that they were sheltered from winter storms.

In the spring and early summer months, most of the population would move away from the main villages in order to exploit the marine resources on the coast proper, including shellfish, fish, and marine mammals. Other resources might also be exploited at this time, such as the plants and land mammals of nearby upland areas. When the runs of anadromous fish began the following fall, the aboriginal population would return to riverside settlements, thus completing the yearly round of subsistence activities.

Unfortunately, very little fieldwork has so far been undertaken at archaeological sites in the adjacent northern Oregon Coast Range, and it is not yet clear in what manner aboriginal utilization of this upland area related to the settlement pattern observed along the Oregon coast. The only locality in the Coast Range where excavations have so far been carried out is at the Siuslaw Falls Site (Pettigrew 1975). This site is situated at a cascade of the Siuslaw River, approximately 40 miles inland from the coast, on the western slope of the Coast Range. Comparison of the artifact assemblage from the Siuslaw Falls Site with the artifact collection obtained from a Willamette Valley floodplain site
suggested that both localities had been occupied by aboriginal peoples culturally affiliated with the Willamette Valley (Petrigrew 1975:454). This conclusion suggests that coastal peoples may not have ventured very far into the interior, an idea that can only be tested through additional archaeological fieldwork in the mountains of the Coast Range.

While very little archaeological research has so far been undertaken in the interior areas immediately adjacent to the coastal margins, to date a number of archaeological sites representing either permanent villages or seasonal campsites have been investigated along the northern Oregon coast. From 1956 to 1958 intensive excavations were conducted by archaeologists from the University of Oregon at a major archaeological site, designated T1-1, located on Netarts Sand Spit in Netarts Bay (Newman 1959). The objectives of this project were to examine the archaeology of the Tillamook Indians who were inhabiting this area at the time of historic contact, to determine the nature of their affiliation with other native peoples of the Oregon coast, and to explore their relationship to the Northwest Coast Culture Area.

A number of exploratory trenches and test units were excavated in the midden at T1-1. In addition, three house pits were entirely excavated and two others were partially excavated. As reconstructed by Newman (1959:42-45), these structures were rectangular houses, placed over an excavated depression, which had walls composed of split cedar planks laid horizontally and a shed-style roof.

A substantial collection of cultural materials was recovered from the site. Artifacts made from the long bones and antlers of deer and elk were the most common items in the collection, and included wedges, awls, needles, bi-points and composite harpoon barbs. Three objects of carved bone featuring art motifs characteristic of the Northwest Coast Culture Area were also found (Newman 1959:26). Some tools represented a much smaller proportion of the artifact collection, but included projectile points, scrapers, gravers, and modified flakes. Historic trade goods were represented at the site in limited numbers, including iron objects (possibly blades), porcelain sherds of Chinese origin, and a copper pendant.

The earliest occupation of T1-1 was radiocarbon dated to around A.D. 1400 (Newman 1959:57). A fully developed culture similar to that of the Northwest Coast with plank houses and associated artifacts was dated at about A.D. 1675 on the basis of another radiocarbon date (Newman 1959:62). The nature of the historic trade goods recovered suggests that the settlement was abandoned sometime during the first quarter of the nineteenth century (Newman 1959:60). On the basis of the artifact and house types found at T1-1, as well as the art forms represented on the carved bone artifacts from the site, Newman (1959:95) concludes that a culture similar to that of the Coast Salish of the Northwest Coast Culture Area was ancestral to that of the historic Tillamook Indians and was established on the northern Oregon coast at least by A.D. 1675.

A second major excavation effort was conducted by archaeologists from Oregon State University at Seal Rock on the central Oregon coast. Excavations at this shell midden took place during the summer field seasons of 1972 and 1974. An in-depth analysis of the materials recovered from the site has not yet appeared, but a preliminary report provides some information on the results of this fieldwork (Ross 1975:3).

Cultural materials recovered from the shell midden consist primarily of a limited number of stone projectile points, scrapers, and utilized flakes, along with various kinds of bone artifacts, including such items as harpoon heads, projectile points, wedges, fish hooks, pendants, bird bone whistles, and whale bone clubs. In addition to the artifact collection, thousands of animal bones were recovered from the shell midden. The great majority of these bones are from seals and sea lions, but the remains of birds, dogs, deer, elk, bear, and fish are also represented.

According to Ross (1975:30), the nature of the midden deposits suggest that Seal Rock was used by aboriginal peoples for short visits as an activity area rather than as a permanent settlement. Radiocarbon dates obtained from the shell midden at Seal Rock indicate an initial use of this site around 400 years ago (Rambo 1978:4). An absence of historic trade goods suggests that the site was abandoned by at least the early nineteenth century.

A faunal analysis of the pinniped (seal and sea lion) remains from Seal Rock has been completed by Rambo (1978). The faunal data indicate that contrary to ethnographic accounts, the Alsea Indians inhabiting the area at the time of historic contact did in fact intensively hunt pinnipeds. Four species of pinnipeds were represented at Seal Rock, but it was determined that adult male Stellar sea lions were more numerous in the faunal collection than any other sex or age class of any of the other species found at the site. Rambo (1978:82) suggests that the ancestors of the Alsea occupied Seal Rock during the spring and summer when pinnipeds were migrating along the coast in this area.
During the 1973 field season archaeologists from Oregon State University conducted excavations at a shell midden at Neptune State Park in Lane County (Richard Ross, personal communication). The occupation of this site also appears to date from late prehistoric or early historic times, and is probably contemporaneous with native utilization of Seal Rock. A radiocarbon date of 320±45 years B.P. has recently been reported from this site (Ross 1979:9). Analysis of the cultural materials and faunal remains recovered from the Neptune midden is currently underway.

Archaeologists from Oregon State University have also conducted test excavations at the Oceanside Site in Tillamook County (Zontek 1978). The purpose of the project was to assess the impacts that proposed park improvements might have on the site's cultural deposits. A series of test pits and auger holes was excavated which was successful in defining the vertical and horizontal extent of the site. A small collection of cultural materials and faunal remains was recovered during the testing program. Judging from a comparison of the cultural materials found at the Oceanside Site with those recovered from other Oregon coastal sites, Zontek (1978:10) suggests that the occupation of the Oceanside Site dates from late prehistoric times, and perhaps was contemporary with the prehistoric component at Ti-1 on Tillamook Bay reported by Newman (1959).

An unusual historic aboriginal burial discovered near the Salmon River estuary in Lincoln County was reported by Woodward and Archibald (1975). A complete skeleton of an adult male, interred face down in a rectangular grave pit, was found. The skull exhibited fronto-occipital deformation typical of the Aisna and Tillamook peoples who were inhabiting this area at the time of historic contact. Artifacts associated with the burial included a clay pipe bowl, a metal knife, buttons, and glazed ceramic sherds.

As of this time, the only archaeological sites on the northern Oregon coast known to be more than a few hundred years old are four shell middens located in the Seaside-Gearhart area in Clatsop County. The results of excavations at these sites have not yet been fully reported, but some information is available from two preliminary reports (Phebus and Drucker 1973, 1977).

The Palmarose Site is an extensive shell midden situated on an old beach terrace. Current excavations at this midden are concentrating on the exposure of a rectangular pit house. Charcoal from a hearth in the center of this structure has been radiocarbon dated at 615±70 B.C. This rectangular house feature is similar to that characteristic of aboriginal peoples living on the northern Oregon coast and Lower Columbia River in historic times, indicating that the construction of this type of house structure has considerable time depth within this region.

The artifact collection from the Palmarose Site contains a preponderance of bone and antler objects, but stone tools and shell items also occur. The artifact assemblage is characterized by the following implements: medium to large stemmed and notched projectile points, lanceolate blades, atlatl weights, pumice shaft abrasives and mortars, composite harpoon points, antler digging stick handles, bone chisels and awls, antler wedges and knife handles, shell adz blades, and pendants made from elk and shark teeth.

According to Phebus and Drucker (1973, 1977), the artifact complex from the Palmarose Site is related to that of the riverine-oriented prehistoric cultures of the nearby Lower Columbia River. Radiocarbon dates from the Palmarose Site suggest occupation over a relatively long time span, beginning as early as 600-700 B.C. and continuing intermittently until the settlement was abandoned about A.D. 200.

The Par-tee Site is a shell midden located on the east bank of the Necanicum River near the Palmarose Site. Radiocarbon dates from the Par-tee Site indicate that it was occupied slightly later than the Palmarose Site, with the major period of occupation occurring between A.D. 145 and A.D. 915.

Like the Palmarose Site, the artifact collection from the Par-tee Site is dominated by bone and antler tools, with lesser emphasis on stone and shell implements. The artifact complex from the Par-tee Site is characterized by many of the same artifact types found in the Palmarose assemblage, and includes the following implements: small to medium stemmed projectile points, lanceolate blades, atlatl and atlatl weights, sandstone abrading tools, composite bone harpoons, antler digging stick handles and wedges, bone chisels, mussel shell adz blades, olivella beads, and small perforated stone discs.

According to Phebus and Drucker (1973, 1977), the greater abundance of sea shell and fish remains in the midden at the Par-tee Site indicates a greater reliance on maritime resources than was in evidence at the nearby Palmarose Site. As a result, it is suggested that the closest affiliation of the Par-tee Site is with the prehistoric maritime cultures of the Northwest Coast.
A third shell midden located in the Seaside area of Clatsop County, the Avenue Q Site, has also been tested (Phoebus and Drucker 1973, 1977). The small artifact assemblage recovered from this midden includes two atlatl fragments, specimens which suggest cultural affinity with the nearby Par-tee Site. A series of radiocarbon dates from the Avenue Q Site which range from A.D. 275 to A.D. 620 indicate that occupation of this shell midden was at least in part contemporary with that of the Par-tee Site.

An archaeological field methods class from Clatsop Community College conducted excavations over three seasons at a shell midden near the town of Gearhart in Clatsop County. An artifact collection including stone projectile points, various bone tools, and shell adze blades was recovered, as well as a substantial collection of faunal remains. A single radiocarbon date of 860±110 years ago has been obtained from this midden. The cultural and faunal materials from this site are currently being analyzed at Oregon State University (Richard Ross, personal communication).

Although the radiocarbon date of 615±70 B.C. from the Palmrose Site is the earliest documented aboriginal occupation on the northern Oregon coast, two archaeological sites on the southern coast of Oregon have yielded slightly earlier dates. A radiocarbon date of 2960±45 years B.P. or 1010 B.C. has been obtained from the Umpqua-Eden Site, an extensive shell midden near the mouth of the Umpqua River (Ross and Snyder 1979). Site 3SCU62 located on the Pistol River has yielded a radiocarbon date of 3000±90 years B.P. or 1050 B.C. (Cressman 1977:194-195).

The relative recency of the prehistoric occupation of the Oregon coast—all known sites date within the last 3000 years—is in contrast to the long sequence of human occupation documented in the Willamette Valley, the Lower Columbia Valley, and elsewhere in the Pacific Northwest. The absence of evidence for aboriginal populations on the Oregon coast prior to this time is probably due at least in part to rises in sea level during the Early Postglacial climatic interval (Hansen 1947:113; Heusser 1960:183). Any traces of aboriginal occupation along the Oregon coast prior to 6000 or 7000 years ago are likely to be covered over, either on the submerged continental shelf or under alluvium deposited where river valleys were drowned by the rising ocean.

On the other hand, the rise of sea level should not have obliterated all traces of early occupation along the Oregon coast. In view of the fact that the archaeological evidence at the Palmrose and Umpqua-Eden Sites and Site 3SCU62 all seem to reflect aboriginal cultures closely adapted to maritime and riverine environments, it seems obvious that earlier developmental phases will undoubtedly be encountered as a result of future archaeological research on the Oregon coast.

**SUMMARY**

The lands administered by the Bureau of Land Management's Salem District in northwestern Oregon include portions of four distinct cultural-ecological provinces: the Lower Columbia Valley, the Willamette Valley, the Northern Oregon Cascade Range, and the Northern Oregon Coast. Archaeological research indicates that prehistoric peoples developed cultural adaptations closely geared to the subsistence resources available within each of these provinces.

At the present time, continuous sequences of prehistoric occupation have been documented in two of these four cultural-ecological provinces.

In the Lower Columbia Valley, two complementary culture-historical frameworks have been proposed. The first sequence, based upon excavations in The Dalles area, is most significant for the information it provides concerning early Columbia River cultures. Archaeological evidence from this area indicates that a riverine adaptation oriented around salmon fishing began at least by 9700 B.P., and possibly as early as 11,000 years ago (Cressman et al. 1960). The second sequence proposed for the Lower Columbia Valley, based on fieldwork in the Portland basin, covers the last 2600 years of prehistory in the area, and thus is most informative concerning the late prehistoric and early historic time periods (Pettigrew 1977).

In the adjacent Willamette Valley, archaeological fieldwork at numerous sites has resulted in the definition of a five-period sequence of prehistoric occupation in the region (White 1974, 1975b, 1979). This sequence extends from sometime prior to 10,000 years ago up to early historic times. The Willamette Falls seems to have prevented any sizable runs of salmon from ascending the river, a situation which led the prehistoric inhabitants of the Willamette Valley to develop a generalized subsistence base more heavily dependent on hunting and gathering than on fishing.
At the present time, very little is known concerning the prehistoric utilization of the Northern Oregon Cascades. Excavations have so far been reported at only four sites in this region. The sketchy ethnographic information and archaeological evidence available suggests the resources of this region were utilized by aboriginal peoples from both the Willamette Valley and east of the Cascade Range. Further archaeological research is necessary to document the cultural affiliations and antiquity of the prehistoric populations who utilized the natural resources of this upland region.

The archaeology of the Northern Oregon Coast is also relatively little known, although the antiquity of the prehistoric occupation of this region has been pushed back to around 3000 years ago. Archaeological evidence indicates that the prehistoric populations of the Northern Oregon Coast relied on a combination of natural resources from both marine and riverine environments.
ETHNOGRAPHIC OVERVIEW

For at least 10,000 years, northwestern Oregon was "Indian country," its aboriginal inhabitants occupying the western Pacific coastline, the shores of the broad Columbia River, the rich Willamette Valley, and the foothills of the Coast Range and the Cascades. Undoubtedly, they observed the same natural events as do the current occupants: the seasonal changes triggering the availability of resources; the annual return of salmon up the Columbia and its tributary streams; and even an occasional eruption of a Cascade volcano. Euro-American explorers and traders first experienced these lifeways in comparatively recent times; how far they extend into the past is not adequately known. Such cultures are not static, being modified or displaced by the agencies of war, disease, and environmental alteration. However, the archaeological record presently available for northwestern Oregon shows only minor fluctuations in trait distribution, with no sharp disjunctions suggestive of a major population displacement. Because of this apparent continuity, the area's inhabitants met by Euro-Americans late in the eighteenth century may have been the direct historic descendants of those ancient peoples whose material remains have been recovered in archaeological excavations.

The use of a direct historical approach for ethnographic analogy allows interpretation to be made of these remains to those of other societies. The earliest historic accounts can provide important documentation of cultural items within the context of a functioning society. While the artifacts of the distant past remain mute, inferences may be drawn regarding probable use, method of manufacture and disposition, as well as lending insight to the collective world view of those folk who created them.

The focus of this section is on the identity, distribution, and cultural lifeways of the recognized linguistic and ethnic groups who were living within the present Salem District of the Bureau of Land Management at the time of contact. Geographically, the entire northwestern sector of Oregon from the Cascade Mountains to the Pacific Ocean is considered, as well as adjacent portions of Washington when appropriate, to aid our understanding of group interaction. The political boundaries established following contact rarely reflect aboriginal boundaries. The Columbia River, for example, is now an isolating barrier to our land-based transport, whereas it once was the main avenue for riverine-based transport of the prehistoric and early historic peoples.

In this study the native groups generally known as the Kalapuya, Molala, Chinook, Clatskanie, Alsea, and Tillamook, and their culturally similar local subdivisions, are considered. The interested student will be immediately struck by the unusual linguistic diversity to be found within this relatively small area, similar to the cultural complexity witnessed among the northern California cultures which were isolated by geographical features. However, in northwestern Oregon, this linguistic diversity overlies a generally homogeneous cultural base. The main distinguishing factor between the coastal and inland peoples centered principally on the methods of gaining a livelihood, which in turn was dependent upon the available resources in a particular area.

Analysis of Indian distribution and identification is usually made on the basis of
(1) linguistic relationships according to a standard system of linguistic classification,
(2) culture areas, paralleling ecological zones, or (3) the first-hand accounts of early visitors to the area, including anthropologists, explorers, government officials, and others. Each of these topics will be addressed below and followed by a discussion of the major Indian divisions who occupied lands in northwestern Oregon in the early historic period until circa 1855.

LINGUISTIC IDENTITY AND DISTRIBUTION

Language boundaries most clearly define the major Indian groups formerly occupying northwestern Oregon. During the early historic period at least six distinct linguistic families and language isolates were recognized among the native peoples. Early philological studies by Hale (1846), Dorsey (1889), Boas (1894, 1901), Frachtenberg (1917, 1918), and Jacobs (1936, 1937, 1958), and more recent studies by Rigsby (1965) and Hajda (1976) provide a considerable body of information about the aboriginal languages once spoken in this area.

A classification of Oregon Indian languages, following the genetic classification for North American Indian languages by Voegelin and Voegelin (1966), is presented in Table 6. All known languages have been taxonomically ordered on the basis of the number of linguistic features which they share (e.g., word order, vocabulary, sounds). The level (i.e., language, family, phylum) indicates the relative relationship to a common ancestral source. For example, languages ordered within the Kalapuya family are more similar to each
Figure 6. Distribution of Indian Groups in Northwestern Oregon Circa 1850 (from Loy et al. 1976:8).
TABLE 6

Classification of Oregon Indian Languages
(after Voegelin and Voegelin 1960)

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Language Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Na-Dene Phylum</td>
<td>*A. Athapaskan Family (includes Clatskanie and languages of groups in southwestern Oregon)</td>
</tr>
<tr>
<td>2. Hokan Phylum</td>
<td></td>
</tr>
<tr>
<td>3. Penutian Phylum</td>
<td>*A. Chinook Family</td>
</tr>
<tr>
<td></td>
<td>1. Upper Chinook</td>
</tr>
<tr>
<td></td>
<td>2. Lower Chinook</td>
</tr>
<tr>
<td></td>
<td>*B. Kalapuya Family</td>
</tr>
<tr>
<td></td>
<td>1. Santiam-McKenzie</td>
</tr>
<tr>
<td></td>
<td>2. Yoncalla</td>
</tr>
<tr>
<td></td>
<td>3. Tualatin-Yamhill</td>
</tr>
<tr>
<td></td>
<td>C. Takelma Family</td>
</tr>
<tr>
<td></td>
<td>*D. Yakonan Family</td>
</tr>
<tr>
<td></td>
<td>1. Alsea</td>
</tr>
<tr>
<td></td>
<td>2. Siuslaw</td>
</tr>
<tr>
<td></td>
<td>E. Coos Family</td>
</tr>
<tr>
<td></td>
<td>*F. Molala Language Isolate</td>
</tr>
<tr>
<td></td>
<td>G. Cayuse Language Isolate</td>
</tr>
<tr>
<td></td>
<td>H. Sahaptin-Nez Perce Family</td>
</tr>
<tr>
<td></td>
<td>I. Klamath-Mdoc Language Isolate</td>
</tr>
<tr>
<td>IV. Aztec-Tanoan Phylum</td>
<td></td>
</tr>
<tr>
<td>V. Salishen Family Isolate</td>
<td>*A. Coast Division (includes Tillamook)</td>
</tr>
</tbody>
</table>

*Languages within the Salem District.*

Other, having a recent common origin, than to languages in the Yakonan family; yet, these two families within the Penutian phylum share more features between them, than with languages in any other phylum. In general this "genetic" or evolutionary classification, similar to biological classifications, sorts out lines of historical connection which have diverged in the past. This scheme has been useful to some extent in attempting to reconstruct past movements of people into new territories.

At the time of contact, Kalapuyan-speakers inhabited the entire length of the Willamette Valley from the Willamette Falls south to the Umpqua drainage. Three distinct languages and an undetermined number of corresponding dialects have been identified: (1) the Tualatin-Yamhill language spoken by the northern divisions of Kalapuya, with two recognized dialects of the language; (2) the Santiam-McKenzie (variously identified) language and six to twelve dialects corresponding to geographical location throughout the central Willamette Valley; and (3) the Yoncalla language, with two or more dialects associated, spoken by the people formerly living in the upper Willamette Valley and Umpqua watershed (Frachtenberg 1938; Jacobs et al. 1945).

Also living in the Willamette drainage along the western slopes of the Cascades were the Molala, a non-Kalapuyan group who entered the area after being driven from their territory in north central Oregon. Until recently, linguists classified the Molala with
Cayuse-speakers in eastern Oregon. Rigsby (1965, 1969), however, after examining the linguistic materials, concluded that Molala is a language isolate of the Penutian phylum, having no known linguistic relatives.

Chinookan-speakers, also belonging to the Penutian phylum, occupied both banks of the Columbia River from The Dalles to the Pacific Ocean (except for a narrow strip occupied by the Athapaskan-speaking Clatskanie), along the Willamette River to the Falls at Oregon City, and up the Clackamas River. This linguistic family also extended along the coast from Tillamook Head, north to Shoalwater Bay. The family name is borrowed from the Chinook, proper, an important group on the northern shore of the Columbia at its mouth. Linguistically, the Chinook were subdivided into two major divisions based on the dialect spoken: Lower Chinook, including the Chinook proper and the Clatsop, on the southern shore of the Columbia at the river's mouth; and Upper Chinook, including all the rest of the Chinook-speakers, with slight dialectic variations.

Along the coast south of the Clatsop were the Salishan Tillamook, whose closest linguistic affiliates occupied the coastal lands of Washington north of the Chinook. Two major dialect divisions have been noted, the Tillamook and Siletz, as well as subdivisions based primarily on occupation of a recognized geographical area, i.e., Nehalem, Garibaldi (Tillamook proper), Nestucca, Salmon River, and Siletz.

South of these Coast Salish, and once linguistically classed among them, were the Alsea/Yaquina who formerly lived about the Alsea and Yaquina rivers. They are now recognized as members of the Yakonan language family, along with their closely-related Siuslaw neighbors immediately to the south. It is interesting to note that despite linguistic similarity with the Siuslaw, the Alsea shared greater cultural affiliation with the Salishan Tillamook by the early historic period (Barrett 1937); thus, it should not be assumed that linguistic boundaries are necessarily cultural boundaries.

Linguists are not in complete agreement about the language classification for Indian groups in northwestern Oregon. Since J. H. Powell published the Indian Linguistic Family of Oregon in 1891, his classification of languages has been reworked numerous times, but to date no taxonomy is universally accepted by linguists. There are also problems in assessing the languages from the linguistic materials collected and weighing the relatively poorly known languages against those better documented. The classification presented here is one ordering of the Indian languages of Oregon. Unfortunately, it treats speakers of a language as a self-contained unit and does not reflect the bilingualism and multilingualism which have been reported for this area.

In addition to the numerous native languages recorded for the peoples in northwestern Oregon, a trade language commonly called "Chinook Jargon" was used extensively throughout the Northwest Coast. Gibbs (1863) suggests that the jargon dates to the early years of fur trade along the coast when, "those mariners, whose enterprise in the fifteen years preceding 1800 explored the intricacies of the northwest coast of America, picked up at their general rendezvous, Nootka Sound, various native words useful in barter, and thence transplanted them, with additions from the English, to the shores of Oregon" (quoted in Pilling 1893:vii). Although a similar trade language may have been used to some extent among natives prior to Euro-American contact, the jargon apparently received its strongest impulse during fur trade negotiations. With the establishment of a permanent trading post at the mouth of the Columbia River, a large number of Chinook proper and Coast Salish (Chehalis) words were added, in addition to English and French. Gibbs further writes, "the words adopted from the several languages were, naturally enough, those most easily uttered by all, except of course, that objects new to the natives found their names in French or English, and such modifications were made in pronunciation as suited tongues accustomed to different sounds" (Pilling 1893:vii).

The number of words constituting the Chinook Jargon has been variously enumerated. In 1846 Hale estimated 250 words in the jargon; Gibbs recorded about 500 in 1863. Eel's dictionary cites 1462 words and 1552 phrases, though he counted only 740 words in actual use. For a review of Chinook Jargon consult Pilling's Bibliography of the Chinookan Language (1893) and Chamberlain's contributions to the Handbook of North American Indians (Hodge 1907:274-275).

Use of the Chinook jargon persisted long after the fur trade ended. According to Zenk (personal communication), the jargon is still remembered by a few people. Despite the absence of grammatical forms, the jargon offered considerable flexibility and power of expression, as observed in the abundance and variety of forms recorded in jargon, such as hymns (Eel's 1876), Bible history (St. Onge 1892), songs and hymns (Bulmer n.d.), sermons (Everett 1883), and numerous dictionaries (e.g., Blanchet 1853; Buhl 1909).
THE CULTURAL AREA

Despite linguistic differences, the aboriginal peoples in northwestern Oregon shared so many basic economic, technologic, social, and religious features as to portray a single cultural image. In defining the cultural and natural areas of North America, A. L. Kroeber (1939:28) included these aboriginal peoples of northwestern Oregon along the larger Northwest Coast culture area which he characterized as "originally a river or river-mouth culture, later a beach culture, and finally in part a sea-going one." Kroeber considered the Northwest Coast culture area to be one of the more highly developed and differentiated in America, and to have received greater influence from Asia than from Middle America, due in part to its geographical location and history. The cultural area overlay the hygrophytic coniferous forest which extends along the Pacific Coast from Alaska to northern California. Within the bounds of this common natural area, similar cultural elements were developed and shared.

The Tillamook, Alsea, and Chinook were included in the "Lower Columbia" subarea; the Kalapuya constituted the "Willamette Valley" subarea, which was the only wholly inland group included in Kroeber's Northwest Coast culture area. Some anthropologists have classified the latter subarea as a grassland culture since the Willamette Valley is the only tract within the Northwest Coast culture area that is not continuously forested. However, Boas (1948) and Wissler (1950) generally support Kroeber's designation of the Willamette Valley tribes as belonging to the Northwest complex.

In general, Northwest Coast cultures emphasized an economy based primarily on marine and riverine resources and a technology which allowed successful exploitation of these resources; a weekly defined political system in which the village is the basic autonomous unit; emphasis on the acquisition and redistribution of property; and individual status defined to a considerable extent by wealth. The elaboration of woodworking, water transport, trade networks, art forms, and site ownership were manifestations of the general cultural pattern. While many of the features are absent or attenuated among northwestern Oregon Indians, in comparison to the more northerly Indians (e.g., Kwakiutl, Haida, Nootka), the overall pattern is represented (Driver 1969; Drucker 1965).

SOURCES AND THEIR HISTORICAL CONTEXT

Information about cultural patterns of the local aboriginal peoples is drawn primarily from two types of research materials: the early historic records of Euro-American explorers, traders, missionaries, and settlers; and the ethnographic data collected by trained anthropologists from field investigations and interviews with Indian informants.

Historic Resources

Historical sources provide the initial data on which this study is based. As a consequence of international exploration and the establishment of fur trading posts within this area in the late eighteenth and early nineteenth centuries, there is a wealth of historic research materials, primarily in the form of navigation logs, journals, narratives, and letters. Descriptions of the native groups which were recorded by these early contact visitors are extremely valuable because of the rapid post-contact decline of the Indian populations in northwestern Oregon caused by introduced diseases. This is despite the facts that most of the early authors were not ethnographers in an anthropological sense; their observations often present a sketchy or biased picture of the Indian groups contacted; many of these earliest international accounts are presently inaccessible because of their deposition in distant archives of foreign countries; and that only a few of these manuscripts have been published or translated into English. In spite of these problems, one must rely heavily on them for their added detail, because there was little scientific anthropological investigation conducted in this area until after most of the survivors of the epidemics had been placed on reservations, and their lifeways in large part destroyed.

The first documented contacts with the native peoples in the present Salem District were by a number of explorers and traders sailing along the northern Oregon coast. Although there is increasing information, albeit inferential (see Ruby and Brown 1976; Johansen and Gates 1987; cf. Wuerch 1979), for contact with the coastal Indians by seamen during the eighteenth century, it is Robert Haswell's Journal of his first voyage with the Columbia (Hoyt 1941) which provides the earliest available written account of any Indian people living in northwestern Oregon. Traveling north along the Oregon coast in 1788, Haswell provides a brief description of contact with the Alsea, Yaquina, and the Tillamook.
In 1792, Gray forced the dangerous bar of a western river in that same ship and won the right to name one for the other, *Columbia*. His letters and narratives (in Howay 1941), and those of his first mate, John Bolt (1921; Howay 1941), provide accounts of the Chinook near the mouth of the Columbia River, primarily those living in villages on the northern bank. During the same year, Captain George Vancouver's tender, the *Chatham*, commanded by Lt. Broughton, sailed up the Columbia within one mile of the Columbia Bar, Oregon, to claim possession of the country for the British Crown. Broughton's journal of this mission includes several sketches of the Indians observed on this journey (Barry 1926). From this time onward there were continual recorded contacts of Euro-Americans and native cultures, with the most direct and consequential interface occurring among the native groups on the Lower Columbia. In 1794, Captain Moore wintered at the mouth of the Columbia, as did Captain Bishop's ship *Ruby* (Elliott 1927; Bishop 1967).

The journals of Meriwether Lewis and William Clark (Thwaites 1905) are the single most important set of documents available for the reconstruction of the aboriginal lifeways along the Columbia River (Suphan 1974), even though the time of their expedition reached the lower stretches of the Columbia late in 1805, the results of a decade of interaction could be seen in the *Indian* possession of a wide range of Euro-American trade goods, and with evidence of diseases, toasts, and stories. These journals furnish the first extended, detailed record of the native populations formerly living in northwestern Oregon. Unlike their sea-going predecessors, one of the explicit intents of this transcontinental journey was to record the description, identification, and distribution of native peoples and their environment in areas through which the expedition passed. The party wintered among the Clatsops near the mouth of the Columbia, and the contacts established there and among peoples to the south, as well as those encountered along the Columbia enroute to the Pacific, provide with early information on the Chimakum, Salishan (Tilamook), and Athapaskan (Clatskanie) speakers from the Cascades to the Pacific and south at least as far as Tillamook Head (Lewis and Clark, in Thwaites 1905). Also included is information on many aspects of native life such as technologies and material culture, food resources and subsistence activities, location of villages, population, and social customs. The journals of other members of the expedition party, such as Gass and Ordway, provide additional information from their personal experiences.

With the establishment of fur trading posts at present day Astoria, Sauvies Island, and Vancouver from 1811 to 1825, numerous additional historical sources are provided. Descriptive data on the local native groups are found in the diaries and narratives of Gabriel Franchere (1954; H. C. Franchere 1957), Ross Cox (1957), Alexander Ross (1923), Alexander Henry (Coues 1955), and Robert Stuart (1953). Their writings basically confirm and expand the observations made by the Lewis and Clark party. Since these men maintained long-term trade relations with northwest Indians, living among them for several years at a time, their narratives provide additional information about these cultures as functioning entities.

By 1830, however, these agents providing the best documentation of the pre-contact cultures were at the same time supplying many of the instruments which rapidly orchestrated the disruption of native lifeways. Within the next five years, the population along the Columbia River suffered a drastic decline from the "intermittent fever" epidemic which swept through the area about 1830. During the decade, as much as nine-tenths of the aboriginal population died (see Taylor and Hoaglin 1962; Boyd 1975; Cook 1955).

Following the decline of native populations, numerous explorers, missionaries, and settlers entered the area. The works of Douglas (1914), De Smet (1895), Hines (1822), Lee and Frost (1968), Swan (1972), and Strong (1906) are of special interest for their personal accounts of the surviving native peoples. While the latter two authors lived among the Chinook at Willapa (Shoalwater) Bay and Cathlamet, respectively, their descriptive accounts of numerous facets of native life are important to our understanding of peoples on adjacent lands. An increasing influx of visitors and settlers in the 1840s and 1850s resulted in many additional, though inconsistent, accounts and reminiscences about the native cultures observed (cf. Burnett 1904; Davenport 1907; Kane 1971).

**Ethnographic Studies**

The majority of ethnographic studies are heavily slanted toward linguistic and mythologic information, with fewer reports available of more inclusive or comparative content. As individual researchers and the groups with whom they worked have been discussed earlier (see "The Area in Previous Research"), a listing of important source materials follows. Principal investigators dealing directly with native informants and the date(s) of their key reports include George Gibbs (1877); Albert S. Gatschet (1877, 1889); J. Owen Dorsey (1889, 1890); Franz Boas (1894, 1896, 1901, and others); Livingston Farrand (1901, 1907); Edward S. Curtis (1911); Leo J. Frachtenberg (1916, 1917, 1918, 1920); Melville
Jacobs (1936, 1937, 1941, and others); Homer G. Barnett (1937); Verne F. Ray (1938); Philip Drucker (1943); Herbert C. Taylor, Jr. (1944a, 1944b); and Robert J. Suphan (1974).

Problems of identity and distribution of Indians in northwestern Oregon have been addressed by J. Nelson Barry (1927); Joel Bereman (1937); Robert Benson (In Farmer et al. 1973); and Stephen Dew Beckham (In Loy et al. 1970), among others. Important summary work by ethnologists pertinent to this study area include: Henry R. Schoolcraft (1851-1857); John W. Powell (1891); Albert B. Lewis (1906); Frederick Webb Hodge (1907, 1910); and John R. Swanton (1952). For sources dating generally with Northwest Coast Indian cultures, see Philip Drucker (1965), Harold Driver (1965), and Tom McFeat (1966).

Additional resources dealing with specific groups or topics are cited, where appropriate, in the text to follow. It should also be noted that a considerable body of ethnographic material (e.g., field notes, correspondence, and unpublished manuscripts) is held in the National Archives, the Bureau of American Ethnology files, and numerous scattered private collections, such as the Jacobs' Collection at the University of Washington. These are largely untapped primary resources which could yield additional information about past Indian cultures in this area. The forthcoming Northwest Coast volume of the Smithsonian's Handbook of North American Indians, edited by Wayne Stutes, should provide a valuable scholarly synthesis of information relating to Indian cultures, including those in northwestern Oregon.

PROBLEMS REGARDING INDIAN IDENTITY

Many of the early explorers, fur traders, and settlers identified the native populations as separate "tribes" or "nations." These classifications, which are unsupported by the ethnographic record, were largely based on the Euro-American's preconceived notion that the social organization of all Indians centered around a tribal unit and that each tribe had distinguishing characteristics. While ethnographers point out that no political unit beyond the autonomous village level existed in aboriginal times west of the Cascades, some continue to use tribal labels.

Additional confusion occurs with the multiplicity of names assigned to a particular group. Various factors contribute to this. The Indian names for themselves have been understood and recorded in diverse ways, varying with the listener; such names were often unpunounceable or unrepresentable by the recorder's own alphabet. Names provided by another group usually differed from the group's own name for that location. Also, some names of a particular group have been extended to collectively identify a number of villages or an entire language area (e.g., Chinook). And frequently, names were applied to Indians that had no relation to aboriginal names, but were assigned according to personal characteristics, real or imagined. Typological errors and phonetic transcriptions of native terms further contributed to the variety of names found in the literature. The Bureau of American Ethnology early recognized the need for a more standard nomenclature for ethnological investigation, and in 1885 began compilation of all identified Indian groups north of Mexico. The identity of the aboriginal peoples addressed in this report generally follows the format presented in Hodge's Handbook of American Indians North of Mexico (1907, 1910). Because of the profusion of names that appear in the literature, a synonymy is included for each major group of northwestern Oregon Indians that is discussed below.

KALAPUYA

The term Kalapuya has been used in a collective sense to identify the numerous groups of aboriginal inhabitants in the Willamette Valley who spoke at least three distinct languages and various dialects belonging to the Kalapuyan language family. In early historic times, the territory of the Kalapuyan speakers extended south from Willamette Falls (present site of Oregon City) to the Umpqua watershed and from the Coast Range east to the foothills of the Cascade Mountains. The Kalapuya are the only totally inland peoples to be included in Kroeber's Northwest Coast culture area (Kroeber 1939). Early historic accounts describe a very high Indian population density in the Willamette Valley, but this population suffered severe losses during the epidemics of the early nineteenth century (Lewis and Clark, in Thwaites 1905; see also Schoolcraft 1853, 1854, 1855).
Distinct divisions or "tribes" were apparently recognized by the aboriginal peoples, based not on political authority, but on locational and linguistic factors (Zenk 1976). The individual identity of each Kalapuyan division was principally determined by residence in a recognized territory (for example, the Tualatin watershed), use of a distinct dialect, and practice of cultural lifeways slightly different from neighboring groups. Each division was comprised of several villages that were central to resource areas more or less commonly exploited.

Major Kalapuyan divisions include the Tualatin (Atfalati), Yamhill, Pudding River (Ahantchuyuk), Santiam, Calapooya, Luckiamute, Mary's River (Chepenefa), Muddy Creek (Chenapho), Long Tom (Chelamel), and Yoncalla. It should be noted that a multitude of names have been reported for the Kalapuya in the historic and ethnographic literature; many of these have not yet been clearly assigned to the more generally recognized groups or village sites. Thus, it may be that other native divisions were recognized in earlier times (Farrand, in Hodge 1907:645-646), but sufficient information is not presently available to substantiate this contention.

Following is a brief discussion of each of the major divisions whose territory included land now within the Salem District, the ethnographically known subdivisions or villages, and population figures, when available. A synonomy of names that have been used to identify each group in the literature is provided to assist further investigation; this is drawn from Hodge (1907, 1910). Village names are provided by Hodge and site location information is from Swanton (1952) and Zenk (1976, personal communication), unless otherwise indicated.

**Tualatin**


The Tualatin, or Atfalati Indians are one of the best known Kalapuyan divisions. These aboriginal peoples occupied the Tualatin River valley, and the drainages of Chehalen Creek and the north fork of the Yamhill River, south to near Lafayette. Farrand (in Hodge 1907:108) suggests that the range for the Tualatin may have extended as far as the site of Portland, but this is not substantiated by the site list below. A recent Masters Thesis by Zenk (1976) provides a rigorous review of ethnographic materials collected by Gatschet, Frachtenberg, and Jacobs, including unpublished manuscripts and field notes. Zenk suggests that the Tualatin were major participants with northern coastal Indians and Chinooks in the regional trade network centered on the Columbia River. Lane (Schoolcraft 1853:156) reported an "Atfalati" in the mid-1800s; the census of 1890 returned 26 (Powell 1891:82); 20 Tualatin were reported on the Grand Ronde Reservation in 1907 (Farrand, in Hodge 1907:108); and the 1910 census data included 44 "Atfalati" (Swanton 1952:454).

**Subdivisions**

- Chachambimanchai—3½ miles north of Forest Grove.
- Chachanin—on Wapato Lake* prairie.
- Chachemenaw—at or near Forest Grove (ca. 6 miles from Wapato Lake).
- Chatchiff—on the northern end of Wapato Lake; an important site for digging wapato roots, used in common by all Tualatins.
- Chachimahiyuk—between Wapato Lake and the Willamette River, south of Beaverton and west of Oregon City.
- Chachimewa—on or near Wapato Lake.
- Chachowith—north of Forest Grove at a place of the same name.
- Chaginduefits—between Hillsboro and Sauvies Island.
- Chachelin—in Chehalen Valley, ca. 5 miles south of Wapato Lake.
Chakeipi—ca. 10 miles west of Oregon City, at or near Beaverton.
Chakupaliu—northeast of Hillsboro.
Chalal—on a prairie just north of Wapato Lake, near its outlet into the upper Tualatin River.
Chalawat—southeast of Wapato Lake; Zenk places this site near the northeast end.
Chamapfit—on Wapato Creek at the east end of Wapato Lake.
Chapanaghtiin—north of Hillsboro; the northernmost Tualatin village.
Chapokele—ca. 4 miles west of Wapato Lake.
Chapungathphi—at Forest Grove; Zenk places it west of the north end of Wapato Lake.
Chatagithl—about the upper end of Wapato Lake.
Chatagshish—ca. 1½ miles north and slightly west of the north end of Wapato Lake; i.e., ca. ½ mile north of Chapungathphi.
Chatakiuin—ca. 7 miles north of Hillsboro.
Chatameel—10 miles north of Wapato Lake.
Chatilkuei—5 miles west of Wapato Lake; Zenk suggests it was west of the Chehalem Valley, in the Yamhill River drainage.
Chawayed—west of Forest Grove.

*Note regarding Wapato Lake (Washington and Yamhill counties): "This intermittent lake, which covers considerable area in wet years, bears the Indian name for the arrowhead or sagittaria, commonly known as the wild potato" (McArthur 1965:534). It is near Gaston, Oregon and is often called Lake Gaston. Loy (1976:184) puts it 12 km. south of Forest Grove.

Swanton lists Chatagithl with the same description as with Chatagithl. Zenk identifies the former as located about a mile southwest of Wapato Lake. See Zenk (1976) for additional linguistic information relating to interpretation of Tualatin place names.

Yamhill

**Synonymy:** Tcha-yamel-amin (Tualatin name), Yamel, Yamhelas, Yam Hill, Yamstills (Hodge 1910:987).

The Yamhill formerly occupied the territory immediately south of the Tualatin, centering their villages and activities along the Yamhill River, a western tributary of the Willamette. The Yamhill and Tualatin together comprised the northern Kalapuya language group, speaking mutually intelligible dialects and sharing numerous cultural features with a "corresponding sense of mutual kinship" (Zenk 1976:4).

Ninety "Yam Hill" Indians were reported by Lane in 1848 (Schoolcraft 1856:701); the 1850 census returned 30 "Yamhill" (Powell 1891:82), and five were reported in 1910 (Swanton 1952:476).

**Subdivisions**

Andshankuwlath—on a western tributary of the Willamette.
Andshimmampak—on the Yamhill River.
Chamifuanin—in the forks of the Yamhill River.
Chaniwi—on the Yamhill River.
Champikoo--on Dallas/LaCreole [Rickreall] Creek (q.v. McArthur 1965: 510, for clarification of the identity of the creek).

Chinchal--on Dallas [Rickreall] Creek.

Pudding River

Synonym: Ahmdshuyk (own name), Ahahshuyk amin (Lunikane name), Ahantchuyk amin (Tualatin name), French Prairie Indians (Hodge 1907:28).

The Pudding River Indians, or Ahantchuyk, a division of the Kalapuya were popularly known by early settlers as the "French Prairie" Indians because of their utilization of the area known by that name in present Marion County which lies between the Willamette and Pudding rivers, and extends south to the present site of Salem.

According to McArthur (1965:500-501), the Pudding River (an eastern tributary of the Willamette, joining it about ten miles south of Oregon City) was named about 1812-1814 when:

Joseph Gervais and Etienne Lucier and their families were camped on the stream, which was called "Hons-a-cha-cha," and in a period of severe weather had the good fortune to shoot some elk. The squaws immediately made a favorite French dish known as a blood pudding, which went a long way toward overcoming the discomfort of rain and snow. While this feast was being enjoyed, Gervais and Lucier christened the stream "Riviere au Soudin," or Pudding River.

While this account lends little information about aboriginal lifeways, it does provide a known native name for the river, and points out the frequent marriage relationships which existed between Kalapuya Indians and the French-Canadian fur trappers that settled about French Prairie. This group was identified as the "Hansoke" (note the similarity to the native name, undoubtedly the feature which gave them their identity) in the treaty negotiations at Champoeg.

Subdivisions

Ponmanafu--a site north of Salem, near Wheatland and Hopewell

Champoeg--near the early white settlement of Champoeg.

The name Champoeg is apparently derived from the local area where "po-wet-sic" or "pdi cik" (commonly called Yampa, a species of Pyridera) was dug in large quantities, "cham" being a common Kalapuyaan prefix (Hussey 1967:18-19; Zenk 1976:85). Hussey (1967:17) provides the following information about this area:

Willard H. Rees, who established a home nearby during the 1840s, said, "Champoeg was the principal Indian village between Chemeketa [Salem] and Willamette Falls and the home of Champoeg chieftains from the immemorial."

Louis Labonté . . . recalled [the site] was "originally a camping and council ground of the Indians." Being near the north boundary of the Kalapocian territory, the spot was visited by the various tribes who came to trade, play games of chance and skill, and not infrequently to intermarry.

Santiam

Synonym: Aha'lpa (Tualatin name) (Swanton 1952:467); Ahalapam, Sandem, Santiams, Santina, Santian, Santians, Sandeham (McArthur 1965:535).

The Santiam formerly occupied lands between Salem and Albany, and east to the base of the Cascades (Beckham 1977:44). There is extensive linguistic material recorded for the Santiam, whose name has been given to the central Kalapuya language of which there were numerous (6-12) dialects spoken in the central Willamette Valley area.

The 1890 census (Powell 1891:82) shows 27 Santiam; Hodge (1910:461) reports 23 Santiam on the Grand Ronde Reservation in 1905, but only five were on the reservation in 1909, as "the remainder received patents for lands and became citizens" (Hodge 1910:464).
Subdivisions [after Swanton (1952:468) and Zenk (personal communication)]:

Chemekeeta--Santiam village at Salem.
Can-ha'im--on main Santiam River, perhaps north of Albany.
Kla-kwa--at or near Albany (Santiam identification uncertain).
Chamifou--on Yamhill Creek; Swanton (1952:476) also lists this site for the Yamhill.
Chanchampenau--east of the Willamette River.
Chanchantu--location not given.
Chantkaip--below the junction of the Santiam forks; this site is also listed for the Luckiamute (Swanton 1952:754).

Luckiamute

Synonymy: Alakena'yu (Tualatin name), Chelekamusches, Chelekaikes, Lakniuk, Lakniut (own name), Luck-a-mi-ute, Luckamute, Luckamutes, Luckiamute, Luckiamutes, Luckimate, Lukemayuk (Tualatin name), Sackanoir, Suchamier, Suck-a-nier (Hodge 1907:754).

The Indian name has been retained for the river in Benton and Polk counties on which this division of Kalapuya lived. The Luckiamute spoke a dialect of the central Kalapuyan language. Lane reported "15 (5 warrios) Suckemier" in his mid-1800 Indian census (Schoolcraft 1851:66); 29 "Lakmiut" were recognized in the 1890 census (Powell 1891:82); Swanton (1952:463) describes 28 "and steadily decreasing" in 1905; and the 1910 census returned eight Luckiamute.

Subdivisions

Anpalamayu--on the Luckiamute River.
Mohawk--on the Mohawk River.
Tsalakmuut--on the Luckiamute River.
Tsamplock--south of the Luckiamute River.
Tsanatawa--south of the Luckiamute River.
Tsanutisha--south of the Luckiamute River.
Chantkaip--note below.
Chepenafa--note below.

Note: Hodge (1907:754) includes the Chantkaip and Chepenafa as bands of Luckiamute; the former is described by Swanton (1952:468) "below the junction of the Santiam River," that is, east of the Willamette River on lands generally given for the Santiam division of Kalapuya. Chepenafa is often considered a distinct group, occupying the Mary's River area, especially near the forks at present day Corvallis.

Mary's River

Synonymy: Api'enfu (called by other Kalapuya), Chep-en-a-pho, Mary River, Marys River, Marysville, Pineifu, Ts'a mipi'enfu ami'en (Kalapuya name) (Hodge 1907:244).

The Mary's River, or Chepenafa, division of the Kalapuya are sometimes considered a subdivision of the Luckiamute (Farrand, in Hodge 1907:244). The Chepenafa spoke a dialect of the central Santiam language, and formerly resided along Mary's River and watershed in present Benton County. Twenty-eight Mary's River Indians were tallied in the 1890 census data (Powell 1891:82); 24 "Chepenafa" were counted in the census of 1910 (Swanton 1952:456).
Subdivisions

Zenk (1976:4) notes the following:

Cam-m'-fu?--at or near Monroe (identification as Mary's River is uncertain).
can-m'-hu?--perhaps between Monroe and Corvallis.
pa'u?-la--location not given, but a woman's name, probably designating her village.
an-tera?tawa--near Corvallis.

Additional Divisions

Two additional divisions of Kalapuyan speakers have been identified by Beckham (1977:44; see also Loy et al. 1975:14) which may have lived at some time on lands within the present Salem District. These are the Tsankupi and the Muddy Creek (Chemapho). Few references can be found for either of these groups to delineate specific aboriginal territories. Tsankupi is listed with the Amphitha, Tsaching, Tsanklightemifa, and Tsowhota as bands of the Calapuyan division, "formerly occupying the watershed between Willamette and Umpqua rs., Ore." (Farrand, in Hodge 1907:187). Zenk (personal communication) points out that "Coupe" was an early name assigned to the Calapooia River. Beckham (1977:44) identifies the Tsankupi territory to have been in the "Brownsville area." More precise site data is not available.

The Muddy Creek group has not been fully identified, though the name certainly suggests occupation of the drainage bearing the same name. However, McArthur (1965:431-432) points out that there are two Muddy Creeks in Linn and Lane counties, both possessing similar characteristics. The creek west of the Willamette River flows into the Mary's River south of Corvallis; the second Muddy Creek rises in the hills east of Coburg and, "flows generally to the Willamette River, finally joining it east of Corvallis."

The Chemapho are mentioned in the Dayton Treaty of 1855 as a Kalapuyan band. "Chem-apho" appears in the U.S. Indian Treaty (1855) as does the "Mady Band," which has been considered a misspelling for Muddy Creek. Farrand (Hodge 1907:646) describes the Chemapho as "presumed to be Kalapooian tribe or band, but incompletely identified."

Further to the south, beyond the Salem District lands, were additional major divisions of Kalapuya, including the Long Tom (Chelameia) along a creek of the same name, a western tributary of the Willamette River; the Calapuya proper, occupying the McKenzie and Mohawk watersheds east of the Willamette and extending to the headwaters of the Umpqua River; and the Yoncalla (Ayanki'l), whose territory and range included part of the Umpqua drainage in Douglas County (Barry 1927:56-59; Berreman 1937:20-23). The Yoncalla spoke the third distinct language recorded for the Kalapuya, of which there were at least two dialects reported. Members of the other two divisions showed less linguistic diversity in that they apparently spoke dialects of the central Santiam language.

Examination of maps delineating Kalapuyan divisional identities and territorial extent, e.g., Berreman (1937:14, 57), Jacobs et al. (1945:n.p.), Farmer et al. (1974:14), and Loy et al. (1976:7), clearly illustrates how the available data have been variously interpreted by each scholar.

Subalimentae

Because of their position above the Willamette Falls with limited access to salmon and smelt runs, it would be reasonable to assume that the Kalapuya placed greater dependence on hunting than those people who lived along the Columbia. Yet, it appears that meat was not their main source of food. Instead, the ethnographic record suggests that the Kalapuya were primarily vegetarians, depending heavily on edible plants, roots, seeds, nuts, berries, and other native fruits (Suphan 1974; Zenk 1976).

The staple food was camas (Camassia spp.) which grew in great quantities in the upper Willamette Valley. In late spring, camas shoots were collected and prepared by boiling for immediate consumption. Collection of this plant continued into the fall when the bulb was high in starch. The 1845 diary of James Clyman provides the following account of how Indians on the Luckiamute River harvested and prepared camas:
The Indians our neighbours were out early digging roots. This operation is performed by sinking a strong hard stick in the ground near the roots to be dug, then taking piny on the outer extremity of the stick, a portion of earth containing from 2 to six roots is taken up. The roots being the size of a small onion and much resembling the onion in appearance, they are then washed and cleansed, a hole of suitable size is dug in the earth filled with wood and stones. After the earth and stones becomes well heated the fire is taken off, and a layer of green grass laid over the hot stones. The roots (are) piled on the grass and a layer of grass laid over the roots. Then a thin layer of earth over the whole and a fire outside of all which is kept up some 24 hours when it is allowed to cool down and the roots are ready for use or for drying and putting away for future use when dry they keep for months or years (quoted in Hussey 1967:14).

Alexander Henry in 1814 noted that the Kalapuya preserved their camas better than others, making it up in cakes three inches thick and about ten pounds weight, which kept it fresh and moist (Coutes 1897). Camas was one of the principal trade items for the Kalapuya at regional centers.

Also important to the Kalapuya diet, but more restricted in its occurrence, was wapato (Sagittaria latifolia), which grew in shallow lakes and low areas in the northern part of the valley. Other key plant resources for the Kalapuya included tarweed seeds (Madia spp.) which were harvested in the fall following the annual burning of the prairies, hazel nuts (Corylus cornuta), and various berries. Acorns, while locally available, were not as important a food resource for the Kalapuya peoples as they were among northern California groups. Jacobs and others (1945:20) provide John Hudson's (a Santiam informant) description of acorn preparation as follows:

Now they would roast them in hot (coals in the) ground (till they cracked)... They dried the acorns' fresh... Now when they wished to eat (some) they had a small soft-light-basket, and they put some of the hot acorns into it. Then they placed it... in water (to soak) maybe one day and one night.

Lupine (Lupinus spp.), cattail (Typha latifolia), yampa (Ferulididium sp.), skunk cabbage (Lysichiton americanus), bracken fern (Pteridium aquilinum), and other locally abundant plants provided additional variety of roots, stalks, and greens. More than fifty plants native to the Willamette Valley have been identified for their food and economic values to the Indians in the northwest (Zenk 1976; French 1966; Gunther 1973).

The only plant known to have been cultivated in the valley was tobacco. Two species were utilized: the native Nicotiana multivvalis and an imported variety. Seeds were sown in small clearings away from settlements, often in the ashes of a recently burned stump. David Douglas, a Scottish botanist traveling through the Willamette Valley in the 1820s, noted the unusually large leaves that resulted from this natural fertilizer. Tobacco was mixed with dried kinnikinnik (Arctostaphylos uva-ursi) leaves and smoked (Zenk 1976).

The basic vegetable diet was supplemented with various species of game, fowl, fish, crustaceans, and insects. Zenk (1978) has provided a detailed ethnobiology of resources recognized by the Tualatin. Collins (1951) gives a brief overview of ethnocultural information regarding subsistence resources throughout the Kalapuya territory, and White (1975) discusses resource availability of species by habitat for the Willamette watershed.

Abundant game resources were available to the Kalapuya year-round, including the black-tailed deer, in wooded areas at varied elevations by season; white-tailed deer, frequently found in the dense woods and brush in the lower foothills and valley; elk, formerly found in the open country in the Willamette and Columbia river valleys, especially during winter months; and aquatic mammals such as beaver, river otter, and muskrat, found about the marshes and streams throughout the area. Black bear, cougar, bobcat, rabbit, squirrel, raccoon, and seal (from the Columbia River) have also been reported as game. Apparently coyotes and grizzly bears were hunted, but not eaten (Jacobs et al. 1945).

Henry (Coutes 1985:817) observed one hunting technique employed by the Kalapuya about 1814:

Their method of hunting deer is to wear a deer's head with horns complete, which they occasionally rub with a stick they carry. In imitation of the animal's motions, while they keep their bodies concealed, and thus decoy the game.
Noose snares, pitfalls, communal or "circle" drives, and solitary hunting were also reported for the Kalapuya. While most hunting could be undertaken in the valleys and hills near camps, various groups shared the same hunting areas in the Tualatin Hills and the Coast Range as far away as the Clatskanie and Tillamook territories (Jacobs et al. 1945; Zenk 1976).

The Pacific migratory flyway, extending the length of the Willamette Valley, seasonally brought avian species such as geese, swans, and ducks into Kalapuya territory. Waterfowl and other birds wintered and bred along the flyways. In sloughs, marshes, and river courses which provided excellent habitat to attract them. Grouse, quail, pigeons, and doves, among others, were resident species and thus available throughout the year.

Contrary to widely held opinion, there is evidence that some salmon successfully ascended Willamette Falls, especially in seasons of high water. Wilkes (1845:4:344-345) observed the spring salmon run up the Willamette in June of 1841 and noted:

The salmon leap the fall; and it would be inconceivable, if not actually witnessed, how they can force themselves up, and after a leap of from ten to twelve feet retain strength enough to stem the force of the water above. About one in ten of those who jumped, would succeed in getting by ... I never saw so many fish collected together before; and the Indians are constantly employed in taking them.

The abundance of salmon and the extent to which this resource was harvested upstream of the falls is incompletely known from the ethnographic and archaeological record. The Kalapuya also had access to salmon through trade with the Chinook and the purchase of fishing rights at Willamette Falls. It is also reported that fishing excursions were made by Tualatin along the Trask River (Zenk 1976).

Non-anadromous fish (e.g., trout and suckers), crayfish, and fresh water molluscs were available year round in local streams throughout the area. Insects, particularly grasshoppers and tent caterpillars, provided additional dietary variation (Minto 1900; Zenk 1976).

Seasonal Round

The Kalapuyan seasonal round of subsistence activities was principally in response to the availability and location of food resources. The biannual division of the Kalapuyan year into dry season temporary camps and winter village occupation allowed successful exploitation of resources in varied habitats. During periods of peak harvest activities, from about March, when the first shoots of camas appear, at least into October, small campsites were occupied near the location of the desired resource. Plant foods were collected as they reached appropriate maturity throughout the summer. From late summer into fall some groups embarked on hunting and fishing expeditions into the Coast Range, while others remained near lakes and marshes in the Willamette Valley to harvest wapato roots. In late August or early September, dry prairies in the valley were set afire, after which women collected tarweed seeds and grasshoppers from the burned-over areas. During October to early November, many groups returned to their permanent villages to prepare the houses for winter. During the following season, especially in the coldest times of winter, spirit power dancing and myth telling were the temporary activities (Gatschet, in Zenk 1976:38-43). A summary of subsistence activities for the Tualatin is provided in Table 7.

Field Burning

That the Kalapuya deliberately set fire to the dry prairie in the Willamette Valley is firmly established by early observers. Henry Breckenridge, naturalist for the Wilkes Expedition, found plant collecting difficult because of "the rascally Indians, by setting fire to the prairies had deprived us of many fine plants" (Sperlich 1951:67). David Douglas noted the extent of burned areas in the lower Yamhill River area. Only small, scattered spots near the base of the hills escaped the fire (Towle 1979:17). Boyd (n.d.), Habeck (1961), Johannessen et al. (1970), and Towle (1979) have assembled a substantial body of evidence to support frequent and extensive fires in the valley.

This use of fire served many purposes of benefit to the Kalapuya economic base, among which are the following: the control of brush promoted the growth of important seed-producing grasses and forbs (e.g., Madia); fire effectively parched these seeds and loosened them from the stalk, making seed harvest much easier; other plants which were dependent on an open prairie, such as camas, were maintained; and the open landscape increased individual hunting opportunities as well as facilitating communal drives for deer and elk. Towle (1979:20) suggests that deliberate burning of the Willamette Valley gives
TABLE 7
Tualatin Subsistence Activities by Season
Sources: Zenk (1976:38, 39), Gatschet (1877)

<table>
<thead>
<tr>
<th>Approximate Month(s)</th>
<th>Activity</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>April to July</td>
<td>Fishing: spring chinook salmon</td>
<td>Willamette Falls, etc.</td>
</tr>
<tr>
<td>June to ca. September</td>
<td>Berrying (blackberry, salal, huckleberry, serviceberry)</td>
<td>Various</td>
</tr>
<tr>
<td>July-August</td>
<td>Collecting hazelnuts</td>
<td>Dry, brushy areas, hills</td>
</tr>
<tr>
<td>July-August</td>
<td>Collecting caterpillars</td>
<td>Bottomland ash trees</td>
</tr>
<tr>
<td>July-December</td>
<td>Fishing: fall Chinook, silver, chum salmon</td>
<td>Coast tributaries, e.g., Trask River</td>
</tr>
<tr>
<td>August-September</td>
<td>Harvesting tarweed seeds, collecting grasshoppers</td>
<td>Dry prairies</td>
</tr>
<tr>
<td>September-October</td>
<td>Harvesting wapato</td>
<td>Shallow lakes, marshes</td>
</tr>
<tr>
<td>ca. October</td>
<td>Collecting acorns</td>
<td>Oak woodlands</td>
</tr>
<tr>
<td>ca. October to February</td>
<td>Hunting: elk (herds)</td>
<td>Open country, lower elevations of the Willamette Valley</td>
</tr>
<tr>
<td>November to May</td>
<td>Hunting: white-tailed deer (herds)</td>
<td>Dense woods and brush, Tower hills and valleys</td>
</tr>
<tr>
<td>Year round, especially</td>
<td>Hunting: waterfowl</td>
<td>Marshes, streams</td>
</tr>
<tr>
<td>winter, spring, fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January to April</td>
<td>Fishing: winter steelhead</td>
<td>Coast tributaries, Tualatin and Yamhill rivers</td>
</tr>
<tr>
<td>March to October</td>
<td>Harvesting camas</td>
<td>Various moist habitats</td>
</tr>
</tbody>
</table>

yet more support to the idea that the Kalapuya had a land-based economy, unlike their Chinookan and other coastal neighbors whose activities were riverine-oriented.

Technology

Hunting tools and weapons included the bow and arrow, spear, and clubs. Bows, generally three to four feet in length, were made of fire-hardened yew or oak, reinforced with sinew wrapping. Arrow shafts of oceanspray were tipped with hardwood points for small game or various stone points for larger animals, lashed and pitched in position. Skin or deer head quivers were slung with sinew string. Poisoned points (rattlesnake or yellow-jacket venom) and elkhide shields were reportedly used for war activities (Jacobs et al. 1945; Hartless, in Mackey 1974).

Spears, basketwork traps, and lines were utilized for stream fishing. The traps were of vertical sticks interlaced with bark, set at the mouth of small streams. Spears up to ten feet long were made of hardwood and tipped with bone, wood, or large stone points. Grasshopper or worm bait and lures of human hair or inner willow bark were used on lines for trout fishing. Night fishing with torches or pitch-boards has also been recorded (Jacobs et al. 1945; Hartless, in Mackey 1974).

Additional tools included stone mortars and pestles (sometimes decorated), cooking stones, hammerstones or mauls, pipes, and knives (often hafted with wood handles), and various antler-bone-wood-shell utensils (Collins 1951). Wooden digging sticks with elk antler handles, whalebone clubs (decorated), antler wedges with beveled blades, wooden firedrills, canoes, and paddles have been reported by Jacobs and others (1945) and Collins (1951). Fiber baskets and bags, cattail and tule mats, hazel rope, woven skin blankets of squirrel and gopher furs, and sewn ash bark buckets were also made and used by Kalapuya peoples.
Little is known about the range of artistic elaboration in Kalapuyan culture except for decorated baskets of various forms and sizes, and occasional mention of carved stone mortars and bowls. Petroglyphs located near Gaston, Oregon, have been variously assigned to Tillamook or Tualatin artisans; see Mallery (1986:25-26) and Meyer and Zenk (1978:4-7) for further discussion on the local rock art.

**Structures**

Aboriginal Kalapuyan structures varied according to season and activity. Large multi-family lodges were constructed at permanent winter settlements. Berreman (1937:39) includes a general description which suggests that a semi-subterranean structure was common at some time in the past:

> Long 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 they 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.

William Hartless, a Mary's River Kalapuya, provides more detailed information about winter houses (Hackett 1974:42):

> Forked sticks placed into ground. Cross-pieces tied on then twist grass. This serves as wall. Dirt reinforces the grass about 2 feet from ground. Roof made of bark inclined somewhat. Roof flat. Bark upheld by means of sticks. Just like a shed. Door consists of a mat of rushes. Could be raised from bottom or else shoved aside. Door rather small a man had to stoop to enter. Fireplace right in center. Not dug out. Floor sanded. Smoke-hole a hole in bark. Beds along wall. Mats of tulegrass. No stools. Houses some 60 feet long as many as ten families partitioned off. Door usually faced river. Meat, etc. kept in baskets, sacks tied to rafters.

During warmer months when away from winter villages, the Kalapuya lived in the open air. For periods of poor weather, shelter was sought under large trees, or a simple windbreak of boughs and thatch was constructed (Collins 1951:39-40). DeSmet (1905) reports conical shelters about 15 feet by 20 feet with drying racks in the interior for salmon, roots, and other foodstuffs.

Sweathouses were often associated with campsites near streams or natural pools. A bent hazel whitewash framework was covered with boughs, then soil; a door on the side allowed access. Heated stones were placed in a small depression excavated in the interior dirt floor.

Archaeological evidence indicates that rock shelters and caves also were used for habitation or temporary cover. Unlike village and camp sites, their natural availability and condition would have determined the extent of use. However, ethnographic data is lacking on the Kalapuyan use of these natural features.

**Clothing and Adornment**

During the summer months, grass aprons or skirts, hide leggings, and moccasins were worn by women. Men had buckskin loin cloths, leggings and moccasins, and a fur cloak and cap (raccoon) for chilly weather. Children wore no clothing, except moccasins. In colder seasons, both men and women wore robes of dressed skins (wolf, elk, or bear), heavy leggings and moccasins, buckskin shirts or gowns, and fur or fiber (spruce, cedar) caps. Necklaces (bone), wrist bracelets (bone or bone), arm bands (fur or hide strips), and nose and ear ornaments (especially dntalium, worn in the pierced septum of the nose) adorned both sexes and further identified the social standing of the person.

Hair was worn long, usually in braids and wrapped with otter fur; it was cut only upon the death of a close relative as a sign of mourning. Tattooing was practiced by both sexes with designs commonly on arms and legs; men of status often had arm marks for measuring dntalium and bead lengths. Facial tattooing was also reported for men in the central groups. Head flattening by fronto-occipital pressure was noted for the Tualatin as a sign of status and beauty, but its occurrence and the degree of deformation progressively decreased to the south. Feathers and body paint were reported for various occasions (Hartless, in Hackett 1974).
Socio-political Organization

As with other northwestern Oregon Indian groups, the basic social and political unit was the autonomous winter village. Each village was composed of extended families of related males, their wives (a wealthy man may have had several), and children. Marriage partners were sought outside the village group; there is evidence that marriages were often arranged with non-Kalapuyan neighbors, especially the Chinook (Gatschet 1899; Jacobs et al. 1945).

Jacobs (1936:125) notes that Kalapuyan groups had "head chiefs," although this distinction may have been made as the result of American demands during treaty negotiations. Gatschet (in Zenk 1976:16) suggests that chiefs prior to this time were merely the wealthiest members of their villages. Although deceased chiefs were usually succeeded by their sons, "chieftainship was inherited only in the sense that wealth was inherited" (Zenk 1976:6). The chief was assisted by a council of village males. The extent of their influence is not completely known. A woman could become chief, but not a councillor.

The Kalapuyan recognized group entities or divisions based on co-residence within a common territory. A division (e.g., Tualatin, Yamhill, Luckiamute) was comprised of several closely interrelated village groups, each probably exercising rights of exclusive access to resources in adjacent locales, but all sharing productive areas within a larger territory. Zenk (1976:17-18) suggests that this relationship was an adaptive response to economic demands:

The Kalapuyan subsistence base seems to have been diverse, requiring access to a variety of riverine and upland and lowland habitats . . . such a form of organization would have provided a territory large and diverse enough to offer each local group sufficient access to an adequate range of subsistence resources, but at the same time it would have kept population suitably dispersed by preserving the separate existence of small local groups. The treaty territories indicated for the Kalapuyans seem to bear out the possibility that this was an aboriginal pattern: each "tribe" or "band" elsewhere documented to have probably been a dialectal-ethnic entity seems to occupy its own valley or basin formed by one of the larger tributaries of the Willamette River; each such major valley offered a range of riverine, lowland, and upland types of habitat.

Basically, two social classes were recognized among Kalapuyan: those of freeman and slaves. While there were distinctions between the common man and the wealthy, mobility founded on acquisition or loss of wealth or power did not foster clear class boundaries. Slaves constituted the most definite social stratum. Almost all slaves were captives or descendants of captives originally taken from distant groups and traded widely through the area. There is also mention of selling freemen into slavery for debt payment. Gatschet (1899:214) discusses the fate of slaves among the Tualatin:

Among the Oregonian tribes, the lot of slaves and bondsmen was not so hard as with other tribes farther north . . . among the Atfalati, slaves were allowed to marry fellow slaves, even free persons when horses were paid to their owner for the permission. This payment also insured them, later on, the right of personal liberty. Slaves of the same proprietor were allowed to marry only when the owner bought the other slaves. After that, they were not sold away from each other. Their children remained in slavery, but could not be sold by the owner to other parties, or at least were not sold generally.

Collins (1961:36) notes that slaves were used by Mary's River Kalapuyan for payment of gambling debts and as objects of trade.

Political Alliances

The territorial relations which existed among different Kalapuyan divisions as well as between them and their non-Kalapuyan neighbors is unclear. There is evidence that the Tualatin participated in a regional network of slave trading with coastal Tillamook and Alsea, and the Chinook as Zenk (1976:5) reports:

The main Tualatin role in such activity seems to have been to help supply slaves to the Chinookan trading centers such as that at Oregon City. The Tualatin often obtained slaves through trade with neighboring and distant slave-holding groups; also, the Tualatin themselves occasionally conducted slave-raiding expeditions into such areas as the south Willamette Valley [emphasis added] and the central Oregon Coast.
The Tualatin are known to have intermarried with Chinook along their northern boundary, and to have traveled on occasion to the Columbia River to hunt seals, in addition to frequent trade and eel fishing expeditions to the Willamette Falls. Alexander Henry (Coues 1965) noted that the Yankills and the Chinookan Clowewellas at the falls were able to converse, suggesting considerable interaction between the northern Kalapuyans and the Chinook.

Numerous items appear in the archaeological record and ethnographic trait lists which are not indigenous to the area, such as *dentalia* and olivella shells (*dentalia*, from the south coast of Vancouver Island), large ceremonial blades (northern California), whale bone clubs (Pacific coast), and buffalo robes (Plains). The exact means by which these items entered the area and the extent of contact with outside groups, direct or indirect, is not completely known. Nor is it clear what effect the introduction of horses into the Willamette Valley, circa 1818 (Minto 1900), had on economic and political relations among different groups of Indians. Collins (1951) and Farmer et al. (1973) include maps of trails and possible trade routes leading into the Willamette Valley; White (1975) has identified eleven major natural corridors that may have allowed access to the Willamette Valley.

Ethnographic and early historic sources provide brief mention of areas commonly shared by different groups, but the identity of participants is usually not specified. For example, Ingersol (in Collins 1951:21) reports a place near Salem "where all the Willamette Indians held their council on a circular embankment." Other areas such as Mapato Lake, Patton Valley, and Lone Butte (tap-a-lam-a-ho) have been identified as special areas of economic, social, and religious significance (Zenk 1976; Davenport 1907).

**Religious Beliefs**

Kalapuyan religious life focused on guardian spirits or spirit powers (yalna). Success of almost any kind was believed associated with one's special guardian spirit. A variety of animals, natural phenomena, and inanimate features were recognized as possessors of strength, luck, good, and evil. All members of Kalapuyan society, including slaves, could receive special powers. These were individually sought about the time of puberty during spirit quests at certain known places. Quests entailed a five-day period of fasting, bathing, and strenuous activity.

Shamans were the ceremonial leaders of the community as well as the healers. Both men and women could become shamans, a status usually attained later in life by those who acquired exceptionally strong spirit powers. Ceremonial dances were held to announce the beginning of a shaman's career, and winter dances were held each year to strengthen their powers (Jacobs et al. 1945).

Additional ceremonies/feasts were held to witness important life events of an individual, such as the naming of a child, a girl's first menstrus, and the death of a family member.

Kalapuyan mythology is richly cast with various animals and "supernatural" beings. The culture hero is Coyote—the trickster, transformer, and traitor to his own kind. Other characters are given roles as hero, including raccoon, black bear, and crow. Among the many additional characters were panther (head of household), blue jay (informer, thief), grizzly bear (villain), sapsucker (braggart), fly (tattletale), and a monstrous creature living in mountain lakes. Frachtenberg (1920), who collected numerous myths from Kalapuya and Alsea informants noted no major difference between coastal and inland mythology.

The dead were usually wrapped in robes or blankets in a flexed position and buried in graves or slabbed pits, as Hussey describes (1967:16):

> The dead, if they were people of property, were generally wrapped in robes, decorated with strings of beads or *dentalia* . . . The possessions of the deceased were almost invariably destroyed, and many articles, such as mortars, pestles, ceremonial blades, and even slaves, were placed with the body. Thus it was not unusual for travelers, coming upon a recently made grave, to scare buzzards and coyotes from the carcasses of horses slain in honor of the departed. Cooking utensils and other "tawdry personal adornments" of the deceased often hung from sticks or headboards over the grave. Some people were cremated; and the poor usually had nothing buried with them.

Burials have been found associated with numerous mounds throughout the Willamette Valley. Above-ground interment and cremation have also been reported.
Synonymy: Amole‘ilsh (Kalapuyan name), Kuken (Klamath name), Lati-u (own name), La‘tiwe, Malala, Molalallas, Molale, Malalla, Molallah, Molallals, Molallales, Molalle, Molallies, Mo-lay-les, Molealeys, Molealleg, Mole Alley, Molalelies, Moile, Moile, Moilel, Molallies, Molal-le, Moolalles, Moolcils, Moral-les, Straight Molale, Wrole Alley, Ya‘ide‘sta (Umpqua name) (Hodge 1907:930).

Cultural Identity and Distribution

East of the Kalapuyan peoples were the Molala, who occupied the eastern and western slopes of the Cascade Range, including a portion of the White and Deschutes river valleys in both the early historic period (Rigsby n.d.; Farrand et al. 1974:14). Although they were reportedly of small numbers and widely distributed along the uplands of western Oregon from Clackamas County south to Douglas County, these people apparently shared a single language and cultural tradition. To the north of the Molala were the Chinookan-speaking Clackamas and to the south were the Klamath peoples.

Ethnographic field work, although primarily linguistically-oriented, was conducted with Molala informants over a period of nearly a hundred years. Horatio Hale, with the Wilkes Expedition, collected linguistic information from Molala he met living near Oregon City in 1841. Albert Gatschet, Leo Frachtenberg, and later Melville Jacobs worked with native informants on the Grand Ronde Reservation, with Jacobs reportedly making monograph records of the Molala language (Jacobs 1941). Unfortunately, the major portion of this material remains unpublished. While there are numerous additional references to the Molala in the early historic and anthropological literature, most of these sources are principally concerned with the problem of Molala origins and possible migration, for example Minto (1903), Clarke (1905), Farrand (in Hodge 1907), Berreman (1937), and Murdock (1938). The most recent syntheses of linguistic and ethnographic information is by Rigsby (1965, 1969, n.d.) which serve as the principal sources on which this section is based.

The Molala were generally believed until recently to have been closely related linguistically, and thus historically, with the Cayuse formerly of northeastern Oregon. Hale (1846) had suggested the similarity of languages between the two peoples at an early date, and this concept had subsequently been supported by Gatschet (1877) and Powell (1901). It was thought that at some early date the Molala were forced away from their home territory, perhaps centered on Tyam Valley (early village) and at Sherar’s Falls on the Deschutes River (summer fishing camp) (Murdock 1938), at which time the surviving Molala moved west of the Cascades into the Molalla and Santiam river valleys and south into the Rogue and Umpqua drainages (Swanton 1952). One account of this initial displacement onto lands in western Oregon is provided by Murdock (1938:398) from information gathered from a Tenino Informant, as follows:

Sometimes during the decade 1810-1820, or within a very few years thereof, the Molala were driven out of their territory by the Tenino. A circumstantial account of this Tenino-Molala war was obtained from informant Johnnie Quinn, who had heard the story as a youngster from his grandfather, an actual participant as a young man of nineteen or twenty. The approximate date may be worked out from the fact that, according to agency records, Quinn was born about 1853, and the corroborative evidence that he still retains memories of pre-reservation days. The war began with an act of aggression by the Tenino proper, the Wayn and central Tenino bands not participating. Coveting the productive fishing sites of the Molalla at Sherar’s Bridge, the Tenino moved in early one spring before the Molala had left their winter village. We are not concerned here with the details of how the Tenino met the Molala attack, rescued their leader when he was wounded in the knee with an arrow, and eventually put the enemy to flight. The important fact is that the Molala were driven in a body westward across the Cascade Range, whence they have never since returned, and that their territory and villages were taken over by a group of Tenino colonists who eventually came to form the Tygh sub-tribe.

While a westward migration of the Molala was supported by others, such as Minto (1903), Curtis (1911), and Berreman (1937), each was of a different opinion about the time at which this occurred and the peoples responsible for their displacement. Boas (in Rigsby 1967) and Garth (1964) suggested that the migration of the Molala had instead occurred from west of the Cascades to the east. However, Rigsby (1965, 1969), having studied the existing linguistic evidence and interviewed additional peoples on the Warm Springs Reservation, concluded that: (1) there is no evidence of a recent migration in either direction by the Molala, indeed the information suggests that the Molala occupied the Cascade uplands for some time into the past; and (2) that there is insufficient evidence
to support the contention of a shared linguistic relationship with the Cayuse. Rigsby suggests that the language of the Molala is a language isolate, classed now in the Penutian language family, having no known close linguistic relatives.

**Settlements**

It has been common in the past to designate northern and southern subgroups of Molala (Borrenman 1937:57), the former living about the Molalla River watershed and the latter living in Douglas County. Since the Molala are now considered to have occupied the contiguous area extending the length of the Willamette Valley and beyond, this designation is not used here. Three Molala settlements are reported by Swanton (1912:466) for western Oregon, namely the Chambuka, located on the headwaters of the Santiam River; the Mukanit, on the western slope of the Cascade Range; and the Chakankri, on the headwaters of the Rogue River outside the Salem District boundaries (Swanton 1952:466). Hale (1846) also noted a small group of Molala living near Oregon City in 1841.

**Ethnographic Lifeways**

Despite the numerous references to the Molala in the anthropological literature, ethnographic information available on these peoples is extremely limited. Rigsby (n.d.: 2-3) provides the following brief summary of information drawn from the unpublished field notes of Leo Frachtenberg collected in 1910-1911:

The Molala wintered in sites located along streams in the lower elevations, usually west of the Cascades, and they exploited the higher country for roots, berries, and large game (deer, elk, and bear) at other times of the year. They also fished for salmon, steelhead, trout, eels, and other species in suitable streams and lakes.

Significant tribal or village organization was lacking, and small family groups occupied common winter houses and moved together. Leadership was task-oriented and leaders derived their positions from personal reputation and family status. Slaves were commonly bought from the Klamath, but their numbers and economic significance are unknown. Kinship exogamy was the norm; and the levirate was practiced. The Molala also intermarried with their Chinookan, Sahaptin, Klamath, and Kalapuyan neighbors.

Female infant's heads were flattened, but not those of all males. Both sexes had the nasal septum pierced and were tattooed on the arms. The dead were usually cremated.

Other additional information regarding the Molala's technology or cultural systems which fostered successful exploitation of the environment are not yet in published form. Further investigation of the unpublished manuscripts and field notes of Gatschet, Frachtenberg, and Jacobs may provide added understanding of the Molala lifeways.

Myth-texts were also reportedly collected by these same principal ethnographers/linguists, but these materials are also largely unpublished. Ramsey (1977) has included one Molala myth, which was originally collected by Gatschet and more recently reworked by Mackey and Brundage, in his anthology of Oregon Indian mythology. Martin (1929:26) includes the following legend of a major battle involving the Molala at Minto Pass, a natural corridor over the Cascades:

The story goes that they [the Molala] lived in eternal hatred of their kinsmen—the Cayuses—and transmitted this longing for revenge to their descendants asking them when they should be strong enough, to challenge their former relatives. . . . Finally they considered themselves qualified, so they sent word to the Cayuses to meet them on Minto Pass to fight it out. Their opponents came, but the battle proved very disastrous to the Molala, for only about one-half were left. However, not discouraged, they waited until another generation had grown up and the tribe was strong again. For the second time they sent the challenge. The result was the same. So many were killed they could no longer take the war-path. Because of these fights all Indians refused to use Minto Pass the scene of the struggles, though it was the best means of crossing the Cascades.
The Fate of the Molala

Whatever the circumstances were on which the above Molala legend was based, there are several historic accounts of a battle waged by the Molala in the Willamette Valley in 1847-1848 (see Bancroft 1886; Clark 1927; Johansen and Gates 1967). With the aid of neighboring Klamaths, Modocs, Tuletas, and other Indians to the south, the Molala staged a brief uprising, now generally known as the Molala War, in protest to the increasing encroachment of American settlers in western Oregon. However, the planned offensive proved disastrous for the Indian participants, with the hands of forewarned, armed settlers.

In 1851 the surviving Molala, along with the Kalapuyas, signed the Champoeg Treaty, relinquishing their land claims to the Willamette Valley uplands in exchange for a small reservation encompassing Wapato Lake; however, this treaty was not ratified by the Senate and the defined reservation did not stand. In 1855, the Molala signed the Dayton Treaty and were moved to the Grand Ronde Reservation in western Oregon. When Gatschet visited the reservation in 1877, he found several Molala families. In 1881 about 20 individuals were known living in the mountains west of Klamath Lake (Farrand, in Hodge 1907:930). Rigsby (n.d.; i) recently reported that there are now "only a few people living who identify themselves as being of part-Molala descent."

ALSEA/YAQUINA

The land extending along the Pacific coastline in present Lincoln County from Yaquina Bay south to the Yachats River was once the home range of Indians generally known as the Alsea and Yaquina. These aboriginal peoples, living along the rivers and the adjacent coastal strip, speak languages that perpetuate their native names in modified form, represent the southernmost limit of the predominant Northwest Coast cultural influence. To the south, even among the linguistically related Sitka language, traits of a more northern California type were found (Barnett 1937).

The Yaquina have at times been recognized as a distinct cultural unit or "tribe" apart from the Alsea, primarily on the basis of their activities centered about a distinct geographical location. However, so many cultural and linguistic features were shared by these groups occupying the areas about the Alsea and Yaquina rivers the idea suggests itself that they represent a cultural identity distinct from the Tillamook to the north. They will be addressed here as an overall unit.

Although early historic information is limited (e.g., Haswell, in Howay 1941), several ethnologists have attempted to record past lifeways from native peoples living on the Siletz Reservation. J. Owen Dorsey of the Bureau of American Ethnology visited the reservation in the early 1880s; Franz Boas of Columbia University came in 1890; and Livingston Farrand of the Villard Expedition, American Museum of Natural History gathered data on the reservation in 1900. The earliest information about the Alsean language, anthropometry, and general lifeways comes from these visits. Subsequent studies by Leo Frachtenberg (1917, 1920), Homer Barnett (1937), and Philip Drucker (1943) provide the most detailed information presently available about Alsean cultural lifeways. The following discussion is drawn primarily from these first-hand sources.

Settlement Patterns

The location of Alsea and Yaquina sites is imperfectly known. Barry (1927:61) notes that the Alsea proper occupied 20 villages on the Alsea River and along the coast, in addition to one at the mouth of the Yachats River, attributed to the Yachtch band of Alsea. The Yaquina were reported to have had 56 villages between Elk City and the mouth of the Yaquina River along the coast. Barry makes no attempt to identify function or the location of any site. The following site location information is drawn from various ethnographic sources. A synonomy from Hodge (1907, 1910) is provided for each division.

Alsea

Synonym: Alsea, Aleya, Ælsey, Al-si', Alislaa, Alsi-me-tânne ("flatheads"—Naltunne name), K̓u-k̓i-nis'tōnne (Chastaicosta name), Pāʔifan am:n (Luckiamute name), Sini-te-li-tânne, Tcha ya-xo amin, Tehayesatiłu (Nestucca name), Ulseah (Hodge 1907:45).
Subdivisions

Drucker (1943:62) was able to learn from his elderly native informants only a portion of the Alsea sites. These included:

Luhwiyu—about halfway between the mouth of the Alsea River and the head of tidewater.

Snakiyu and Tsik—on the south bank of the Alsea River near the mouth.

Yahaitc—south along the coast.

Kepai—a short distance north of the river.

Yag'one—close to the site of the present town of Newport; the native term is maintained as the name of the local river and bay.

Natkiutclo—a campsite a short distance up Big Creek (above modern Waldport).

Tsilphoh—a place to which many people went in summer to harvest camas and other wild crops, in the Alsea Valley back in the Coast Range.

Swanton (1952:452-453) identifies the following villages:

Kutau—on the north side of the Alsea River at its mouth.

Kyamaisu—same.

Kaukheen—on the north side of the Alsea River at Beaver Creek.

Kalbusht—on the south side of the lower course of the Alsea River.

Milhau (in Hodge 1910:48) identifies the village of Neahumak at the mouth of the Alsea River. Additional village names are provided by Dorsey (1890, in Hodge 1907:45):

North side of the Alsea River:

Tachwit
Yuhat
Kakhtsbanwaish

South side of the Alsea River:

Chink
Kautuk
Kwulisit
Kwamk

Shiwaun
Khlokhwallyotslu
Mokuntk

Khlimkwaish
Pait
Thleksahauk
Thlekuhweyuk
Skhkhwallyotslu

Yaquina

Synonym: Jakon, Jacon, Jakon, Sa-áki (Nestucca name), Siš-gún-né (Tüne, Southern
Killamuk (falsely called by Hale 1846), Tacóon, Tcha yákun amn (Luckiannite name), Yacona Indians, Yacone, Yacons, Yah-quo-nah, Yakon, Yakona, Yakonah, Yakone, Ya-
un'-ni-me' (Tüne), Ye-k u'-na-me'- (Tüne), Youwiches, Youicone, Youikones, Youikkone, Youkon, Yü-kwin'-a (Alsea name), Yü-kwin'-me' (Coquille name)
(Hodge 1910:993).

Yaquina villages listed by Dorsey (1884, in Hodge 1910:992-993; Swanton 1952:477) include:

On the north side of the Yaquina River:

Holukhik
Hunkhwiltik
Iwai
Khaihuk
Khiukh
Kunumpuyu
Kwulashauk

Kuukiha
Kyuwatkai
Mipshuntik
Mitswistik
Shash
Thiahtsuntik
Thiekshauk

Tkakryu
Tshkitshauk
Tchilkitik
Tukwiskh
Yahai
Yikkhaih
On the south side of the Yaquina River:

Atshuk  Kunukwun  Pkhuwawaiththe
Chulithlityu  Kutsuwifithe  Pkwanlukhtauk
Hakkyawal  Kualshi  Puurothiwaun
Hathetsuksh  Kulsilshauk  Shikhotshi
Hitshimnisui  Kwalchicheshk  Shupauk
Hiwuwithe  Kualash  Thielkwayuk
Kaku  Kwalukhtauk  Thielkus
Khayukkhai  Kwalchunthe  Thilmaithitik
Khitaliitthe  Mulshihtik  Thilukwitsihtu
Kholkh  Naish  Tilmashauk
Khulhanshtauk  Pailknwuthu  Tuhaukshuwitthe
Kilakuutuksh  Pikilfithe  Tulshk

Studies by Dorseay (1889) and Drucker (1943) indicate that the Alsea exploited the streams only a short distance on the lower courses, and that the head of tidewater, about ten miles upstream, was the most inland site of any camp, although Suphan (1974) suggests that food procurement activities may have taken the people further upstream.

Subsistence

Many natural foods were available near Alsea settlements, but marine resources provided the bulk of the diet. The importance of marine resources, especially salmon, is briefly summarized by Drucker (1943:82):

The Alsea were fisher folk. Their choice of dwelling sites, their seasonal migrations up and down their little valleys, and their technological interests reflect the importance of this pursuit in their lives. In their economy, salmon ranked first of the several kinds of fish taken. Dried, it was the mainstay which permitted a winter of leisure unknown to any people lacking a plentiful and easily preserved food source. Other fish and game served only to supplement the diet.

Chinook salmon entered the coastal rivers in midsummer, followed by coho and dog salmon in the early fall. The steelhead trout, which is often grouped with salmon, was an additional sea-run fish prized for its flesh that was taken in the late fall through winter months. Smelt, herring, flounder, perch, and lamprey eels were also harvested as available throughout the year. Clams, mussels, crabs, and sea anemones were collected by the women from estuaries, tide pools, and bays.

Sea mammal hunting was apparently confined to offshore rocks where seals and sea lions congregated; there they were clubbed or harpooned. Whale hunting was considered too dangerous, according to informants interviewed by Drucker (1943), although the occasional beached whale was highly prized for the oil rendered from its blubber.

Although their land was rich in game, the Alsea did not extensively exploit this source of food. Hunting was considered "an adventurous way of augmenting the fish diet" (Drucker 1943:83), and was not pursued with the same vigor as fishing. Deer and elk were stalked along trails or at small forest clearings, especially during the summer when the animals were in fine flesh. Dogs were occasionally used in the hunt to hold an animal at bay until the hunter was within bowshot. Pitfells were sometimes excavated to capture elk, a prized game animal, but the time required for preparation of the pit limited their use considerably. Less attention was given to other game, although it is reported that beaver were dug out of dens and clubbed, and that small fur-bearing mammals were shot with the bow. Quail and grouse were caught in basket traps, and waterfowl were shot. Children used a slip noose to catch seagulls, and seagull and cormorant ("shag") eggs were collected as a food resource.

A wide range of plant foods including roots, greens, berries, fruits, seeds, and nuts gave additional variety to the diet. Cansus was dug in great quantities from summer through fall, with the surplus being prepared for winter storage. Roots of plants, such as skunk cabbage and ferns were harvested in the spring. Salmonberries, blackberries, huckleberries, and strawberries, which grew in profusion along the coast, were important food supplements. Each was collected in their proper season, along with various greens. Acorns were also harvested in small quantities back from the coast. Tobacco was grown at sheltered plots away from the village; it was mixed with dried kinnikinnik leaves for smoking.

Preparation of procured foods for eating or storage was primarily the responsibility of the women. Fresh fish or game were broiled over the coals or boiled in wooden troughs with fire-heated stones. Earth ovens were often used to cook large quantities of food,
such as camas, mussels, and fern roots. Acorns were reportedly eaten raw, without
leaching. Salmon, steelhead, and lamprey were eaten immediately, or split open and smoke-
dried, then stored in baskets or bales in the winter. Salmon eggs were dried on
trays or in gut containers. Smelt and herring were sun-dried whole, or smelt were
rendered in wooden troughs for oil. River clams and mussels were dried and strung on hazel
withes. Elk meat was the only flesh of land mammals that was reported to have been dried
for storage. Stored foods were prepared for consumption usually by pulverizing them and
boiling. These foods were often served with whale or smelt oils which were stored in sea
lion bladder containers (Drucker 1943).

First Food Rites and Taboos

Taboos related to food procurement and consumption included the shooting of fish with
bow and arrow, eating one's first kill, and young people eating deer and elk tongue and
liver (Barnett 1937:166). The first game hunted successfully by a boy had to be given to
the elders as it was considered that bad luck would befall the hunter if he ate it himself.
Similarly, a girl's first gathered fruits, roots, or shell-fish could not be kept for
herself.

There is scant record of the first salmon rites among the Alsea. John Albert told
Drucker (1943) that the first salmon trout caught each year was eaten by the owner of the
fish wier. The fish bones were then wrapped in leaves of a water plant and saved until
enough salmon had been caught to feast all the local people. At this point the bones were
thrown away unceremoniously.

Technology

An extensive list of tools and techniques for food procurement is provided by Barnett
(1937) in his monograph of culture element distributions for the Oregon Coast Indians.
Drucker (1943) also provides a detailed discussion of equipment used for subsistence
activities. The following information is drawn primarily from these sources.

With the Alsea economy based on marine resources, numerous devices were employed for
efficient harvest. Fishing equipment included pole and wite weirs, basketry fish traps of
willow or fir, dip nets with conical sacks attached to long vine maple poles, gill nets,
fish harpoons with detachable bone or horn points, and fish clubs. Traps and harpoons,
used in conjunction with weirs, were regarded as the most effective tools for salmon
procurement. Dip nets of fine mesh or rakes were used to collect smelt and herring. Flounder
and crabs were speared with a sharp stick in shallow water. Eels were taken with a gaff
hook or caught in basket eel pots. Bone gorges and sharp-angled hooks were sometimes used
for trout fishing, but the latter were of minor importance.

In contrast to the number of devices used for fishing, the paucity of hunting gear
other than bow and arrow, harpoon, and club reflects the relatively minor role land game
played in the economy. Blades of obsidian and points of obsidian and local stone material
were known to the Alsea informants, but most cutting and scraping tools were of shell,
bone, and horn. Crutch-handled digging sticks were used for harvesting vegetable foods and
clams, as well as for prying mollusks off rocks.

Woodcutting and basketweaving were important industries. Alsea men built cedar plank
houses, dugout canoes and attendant equipment, and various household utensils, including
cooking vessels, platters, and bowls. Drift logs were utilized when possible for canoes
and house planks. Wooden mauls were used with elkhorn or yew wedges for splitting planks.
Elbow and straight adzes were probably used in conjunction with fire for hollowing canoes,
when they were finished by sanding with scouring rushes or fragments of sandstone. Other
articles such as bows and tobacco pipes (straight and elbow) were fashioned out of harder
wood of different varieties.

The basketry of the Alsea was twined into both rigid and flexible collection and
storage containers for spruce root, beef grass, and rushes. Mats of tule or plaited
cedar bark were used as bedding and floor coverings. Two-ply cordage was spun from sea
grasses; the inner bark of willows and tules were used for ropes and netting. Cradleboards
were made of willow withes. These materials were gathered by the women, but apparently
both sexes participated in the manufacture of fiber articles.
Structures

As with other aboriginal groups whose economy is based primarily on fishing, the Alsea occupied permanent villages for most of the year. These villages were composed of substantial cedar plank houses, as described by Drucker (1943:85):

A large rectangular pit, four or five feet deep, was lined with cedar planks. Posts at the corners and ends supported the gabled roof of horizontal planks laid overlapping. Apparently little or nothing of the side walls showed above the ground level. The dimensions of the houses varied. Some were large enough for three or four families, each with a separate space and hearth. A space left in the planking of the gable end served as a doorway. The door was simply a suspended mat of grass or reeds. By means of a notched-log ladder, one descended to the mat-covered dirt floor. Around the walls, at a height of two or three feet, was the sleeping platform, under which, and on which between the family places, a miscellaneous of dried foods, gear, and personal belongings was stowed.... The more perishable foodstuffs were placed on suspended racks overhead, in the smoky warmth close to the roof.

Temporary summer shelters were constructed at fishing sites away from winter villages. These were rectangular, gabled pole frameworks covered with long grasses or reed thatch. Such structures could be maintained for about two seasons.

Sweathouses were constructed and regularly used for luck in hunting and gambling, purification, and minor curing. Two main types were built by the Alsea: the first, an older structure, was set into a hollowed-out bank or hillside with the front enclosed with planks and roofed with boards covered by earth; the second type was a hemispherical pole frame structure covered with mats. Both were steam heated and could accommodate several people at the same time. Each was owned by the head of a family, and several were usually located in a village.

Material Culture

The mild climate along the coast often made clothing unnecessary. Males were reported by Bennett's informants (1937) to have "fringed fiber" (cedar bark?) skirts and capes; a one-piece fiber apron and cape were also described for females, although all clothing may have been dispensed with in suitable weather. When warmth was desired, men and women alike wore fur capes. Footwear was rarely worn, although moccasins made of deer and bear skins with fur turned inside for lining, may have been used when going into the mountains or during the winter. Basketry hats were not worn, in contrast to many northeastern Indians. Both sexes wore their hair long, often braided in two side clubs and wrapped with mink or otter skins, or knotted.

Heads were flattened for both sexes as a sign of free birth, and a variety of ornaments, including dentailia and bone pendants, were worn in ears and noses, according to wealth. Status was marked not only by the display of dentailia, clamsHELL beads, and sea otter robes, but also in the ownership of slaves who were purchased from neighboring groups. Alsea informants insist that their people never participated directly in slave raids, and it appears that there probably were never many slaves held at any time by the Alsea (cf. Zenk 1976; Farrand 1901).

Little is known about the artistic elaboration supported by the preservation Alsea people. Baskets were decorated with fern (black) and bear grass (white) geometric patterns, but other items of prestige or utility such as canoes, house posts, and tools (e.g., mauls, digging sticks, platters, mortars) are not reported to have carried art motifs to the extent enjoyed by Northwest Coast cultures further to the north. Drucker (1943) notes that dentailia were often decorated by incising, but it is not clear whether the shells had been incised before the Alsea received them.

The few simple musical instruments have been described including bone whistles wrapped with cherry bark and sinew, which were used in dance rites; wooden double whistles or flutes played for pleasure, and roof boards which served as drums during winter dances.

Socio-political Organization

The basic social structure among the Alsea was the autonomous village about which local activities tended to be centered. For all economic purposes the local group was
self-sufficient as food resources were usually abundant and varied within the general village area. Technology did not require the cooperation of units larger than the local group. Social interaction beyond the village was primarily for trading, gambling, and inter-village marriage arrangements.

Each settlement had its own "chief" or headman (k'auktu) who, as Drucker (1943:92) suggests, was the wealthiest member of the village:

It seems clear enough that a person was regarded as a headman because of the wealth which he inherited from his father. He had little or no real authority. His "rank" got him only the respect given the possessor of worldly goods; the concept of nobility of blood was beyond Alsea ken.

Mrs. Ludson, an Alsea informant, further details the role of the headman:

The k'auktu was kind of boss. He was supposed to look after the people. If they were hungry, he would give them something to eat, if he had anything. Sometimes if they caught a lot of fish, they would give him some. He would advise the people, but they didn't have to do what he said (Drucker 1943:92).

Farrand (1901) earlier verified three social classes among the Alsea which included "nobility," commoners, and slaves, and indicated possible upward mobility of commoners with the accumulation of wealth or extraordinary powers. Drucker (1943) views these class distinctions as minimally significant to the Alsea, whom he characterizes as lacking sharp caste distinctions and as maintaining mutual-aid obligations, especially among family members.

Religious Beliefs

The Alsea believed in a myriad of supernatural beings, but they apparently received little ritual attention. Tribal traditions were told only during one month of the year (January) and once past, they were not to be discussed until the following year (Farrand 1901:246). Guardian spirits included numerous kinds of birds and animals and a few natural features such as the sun, moon, comet, thunder, and west wind. A long-haired female wood sprite (ogun) also provided power to appropriate seekers. Black bear, beaver, and the culture hero (e u'ku or Shio'k) figured prominently in Alsea mythology. The culture hero was distinct from coyote, the widely-known trickster, but was by no means more dignified nor free from treacherous tricks (Farrand 1901:245-247; Frachtenberg 1920:12-13; Drucker 1943:98). In his collection of texts, Frachtenberg characterizes Alsea mythology by the absence of creation myths, migration tales, and ancestor legends. Their mythology, in other words, dealt with a world already created.

Illness was ascribed mostly to supernatural causes, and local shamans were called in to diagnose and treat these. Shamanistic practices were the chief religious outlet of the Alsea. Drucker (1943:98-99) discusses the long training processes for prospective shamans:

Preadolescents of either sex were sent out by their parents, either because they showed aptitude for the calling by dreaming a great deal, or because their parents wished them to become shamans on account of the lucrative nature of the calling. A close relative who was a shaman usually had a hand in urging the child to go out, and in instructing him. One reason for this early beginning may have been that persons old enough to realize the hardships and dangers of the profession were loath to undertake it.

... Apparently the (supernatural) being appeared in a dream after the seeker had fasted, bathed, and remained alone long enough. In this dream or vision, the guardian told his protege how and when to train, visiting him in dreams from time to time to instruct him in the shamanistic arts. Songs, special regalia and paints, and similar tokens, would be "given" to the novice in this fashion. The latter continued his training in secret for a fairly long time, often until after he had reached maturity.

Shamans were primarily responsible for curing disease, but they were also called upon to retrieve a person's soul. Drucker (1943:99) elaborates further:

When he arrived at the patient's side, the shaman began to sing, accompanied by the spectators. He did no preliminary smoking. As he sang, 'his power came close to him.' Finally he began to dance. If his guardian spirit had granted him power to work minor miracles--such tricks, for example, as fire eating,
plunging the hands in boiling water, sprinkling the patient with water which
turned to blood—he displayed them. As the dance progressed he became
frenzied, until at last he attained a state in which "he could see every-
thing, all over the world." Through this clairvoyance he could diagnose the
patient's malady. It might be that the sick person's soul (t̓alx̣am?) had
left him. Often sickness was caused by a disease object (t̓alx̣am?) lodged
in his body, sent by some enemy or contracted by breach of some taboo. Or
the sickness might result from a combination of the two. (Sometimes the
disease object seems to have driven out the soul. This of course was quite
serious.) To recover a vagrant soul the shaman sang, sending his familiar.
He did not go himself, either in person or in spirit. When a person really
died, his soul traveled swiftly northward to the place where it crossed in a
cane to the Land of the Dead, whence there was no returning. In soul-loss
sickness, however, a soul seems to have latched along the way, so that the
shaman's familiar had a chance to overtake it.

Shamans were sometimes requested to foretell the future, avert famine, counter malevolent
powers, and provide ritual attention to mourners following the death of a kinsman.

A second class of healers (t̓aməq?) is reported for the Alsea, probably as a result of
contact during the reservation period with southwestern Oregon groups. Such healers cured
minor ills by singing. There is little information about this special group of individuals
and their exact role in the Alsea cultural system.

A feast for a first-born child when five days old was given by the families of the parents.
About this time the child's nose and ears were pierced, and a name, often that
of a deceased relative, was given by one of its paternal relatives, at which time the name
taboo was lifted. Shortly after puberty, a boy could be sent on a spirit quest, although
not all sought special powers. A girl was confined at puberty for two to five-day periods
at which time she abstained from all foods, bathed regularly, and worked on baskets during
the day, if she so desired. Some girls obtained their spirit guardians at this time. At
the end of the second period, bangs were cut across the girl's forehead and dots were
tattooed in rows on her wrists "to strengthen them for womanly tasks" (Drucker 1943:96).

At death, the body was dressed in fine garments, bound on mats, and placed in a
flexed position in a burial caiince which rested on the ground not far from the village.
Valuables such as donalasa and clam shells were placed with the corpse. Occasionally a
rich person might be interred in his house, and the house burned. Mourning observances
by the deceased's family continued for several months.

TILLAMOOK

North of the Alsea along the narrow coastal strip from the Coast Range to the ocean
lived the aboriginal groups speaking the most southern Coast Salish language, Tillamook.
These people were closely related linguistically to Indian groups living north of the
Chinook in Washington and southern British Columbia. It remains a question as to whether
the Salish at some earlier period formed a contiguous cultural unit extending along the
Pacific Coast, being later displaced by Chinookan peoples moving westward down the
Columbia River, or whether a group of Salish broke away from their home villages
and migrated south of the indigenous Chinook. Neither scenario has been confirmed as of this
time.

At the time of contact, Salish lands in western Oregon extended from about Tillamook
Head to Otter Rock. Several hunting and gathering areas in the northern area were
reportedly shared with the Clatsop Chinook. Villages were jointly occupied and many cul-
tural features were exchanged (Suphan 1974:230-231). Early visitors to the area often
included the Tillamook with the Chinook, distinguishing few differences except language.

While there is evidence that the Tillamook had been contacted by European seamen prior
to 1788, the earliest documented interaction with them is found in the narrative of Robert
Hayward, mate of the American ship Columbia, who provides the following account of
August 10, 1788:

At 11 AM there came alongside two Indians in a small Canoe very differently
formed from those we had seen to the Southward it was sharp at the head and
stern and extremely well built to paddle fast they came very cautiously to-
wards us nor would they come without a pistol shot till one of them a very
fine look[ing] fellow had delivered a long oration accompanying it with
actions and J[estures] that would have graced a European orator the subject
of his discorse was designed to inform us they had plenty of Fish and fresh
water on-shore at there habitations which they seemed to wish us to go and partake of - we made then understand that skins was the articles we most wanted - these as well as we could understand then they would bring the ensuing day - we could proceve there language was entirely different from those we had first fell in with to the southward. after viewing the vessell attentively some time they departed well pleased with some trifling presents they had received - the place these people came of from is at Ladt. 45°0' [near the Salmon River] (Howay 1941:32-33).

The next historic description of the Tillamook is found in the journals of the Lewis and Clark Expedition. During the winter of 1805-1806 at Fort Clatsop, extensive notes were made by Lewis, Clark, and other members of the party on the "Kilamaucks" and the neighboring Chinooks with whom they had considerable intercourse (Thwaites 1905). The Tillamook were mentioned frequently thereafter by visitors to the area, among whom were Henry in 1814, Douglas in 1824, and Townsend in 1835. Field research by Franz Boas (1896, 1923), Edward Curtis (1911), May Edel (1939, 1944), Bass Langdon (in Jacobs 1941), Homer Barnett (1937), Herbert Taylor, Jr. (1974a), and Robert Suphan (1974) provide additional ethnographic and linguistic data on the Tillamook people.

Settlement Patterns

Throughout the Tillamook area, villages were located along the major river courses flowing from the Coast Range to the Pacific, especially at the entrance of these rivers into coastal bays and estuaries. As with other Northwest Coast cultures, each Tillamook village was an autonomous unit. This is emphatically stated by Jacobs (in Berreman 1937:39). A village was named for its geographical location, and village members were known by that name. Those villages situated along a major watercourse were referred to by the name of that river, thus the Nehalem, Nestucca, Salmon River, and Siletz geographical divisions. The latter, Siletz, is occasionally classed separately from the Tillamook, based on the use of a more distinct variant of the Salishan language (Taylor 1974a).

The divisional recognition of the north coastal peoples does not appear to have been a part of native identity until such terms were applied by whites during treaty negotiations (Suphan 1974:230-231). Since that time, these divisions have been frequently used. Each will be briefly discussed below, with ethnographically known villages, division synonymy, and population data included when available. However, it should be remembered that these divisions, beyond geographical description, were not recognized as political or landholding entities by the aboriginal Tillamook.

Nehalem


Boas (1896) noted that "Tillamook" is a Chinook term meaning the "people of Nehalem or Nehelem." The activities of the Nehalem, the northernmost Tillamook division, centered about the Nehalem River and Bay adjacent to the Clatsop Chinook. Suphan (1974:234) concludes that:

... from available data the Indians in this area were few in number, dwelling in two or three villages about Nehalem Bay. The falls of the Nehalem was one of the principal fishing spots, while they marked the virtual limit of upstream hunting as well. Beyond Tillamook Head, Indians from this area maintained a village (Necotat) jointly, at least in 1806, with the Clatsops, and made a practice of exploiting the Necanicum River with them.

Clark noted several villages in Nehalem territory in 1806 while on route to a beached whale at present day Cannon Beach. These include:

Na-cost--at the mouth of Elk Creek.

Nat-ti--two miles south of Na-cost along the coast (near Tolovana Park) (Suphan 1974:224-225).

At Elk Creek, Clark (Thwaites 1905:3:225) was told by local Indians that:
the bulk of their nation lives in 3 large villages still further along
the Sea coast to the SSW at the entrance of 3 Creeks which fell into a bay,
and that other houses were scattered about on the coast, Bay, and on a Small
river which fell into the Bay in which they caught Salmon, and from this
Creek (which I call Kil a mox River) [today Wilson River] they crossed over to
the (Mapato I.) on the Shok ah til com (which is the Indian name for
Columbia River) and purchased Wappato etc. that the nation was very large
and that they had a great many houses.

Ellen Center, a Tillamook Indian at Garibaldi, described a village site at present day
Wheeler and “just across the way at another place” All scattered along through
there too, not in any one particular place” (Suphan 1974:61-62).

The Nenahem population was usually enumerated with all the Tillamook, but one count of
28 Nenahem was given for 1871 (Hodge 1910:53). The Nenahem, as other Tillamook speaking
peoples, were placed on the Grand Ronde Reservation following its formation in 1857.

Tillamook

Synonymy: Cal-a-mox, Ca-la-mox, Cal-la-maks, Cal la mox, Callamucks, Callenax, Callemeux,
Callamex, Callimix, Cemmaks, Gillamooks, Higgahalihshu (Nestucca name), Hillemack,
Kellamucks, Klemmoks, Klil a mox, Killamuke, Killamute, Killamook, Killamoucks,
Killamouks, Killamox, Killamuck, Killamucks, Killumoks, Killernoux, Nisitshawas,
Nisitshawas, Nisirtshau, S1 ni'-te-ii, Tilamookhs, T'ul-ii'-'moks-me tünne, Upper
Killamucks, Usitshawas (Hodge 1910:75).

The Tillamook proper once occupied the region about the Tillamook River and Bay, south
to Cape Lookout. Tillamook Bay was the scene of an early historic confrontation between
crew members of the ship Columbia, as reported by Haswell in 1788 (Hoy 1941). Following
the killing of Captain Gray's black servant and the wounding of several crew members by
the Indians, the bay was named "Murderer's Harbor." Lewis and Clark reported eight vil-
lages in this area for the Tillamook, but supplied names for only five. The villages
were principally located at the mouth of the rivers that enter Tillamook Bay, i.e., the
Miami, Kilchis, Wilson, Hoquartan, and Tillamook rivers. It is to the Trosk River, which
flows into the Tillamook River, that the Tualatin Kalapuya are reported to have come to
fish (Zenk 1976).

Villages

Kil-har-hurst--at the present site of Garibaldi at the entrance of Tillamook
Bay, mouth of the Miami River.

Kil-har-marn--on Tillamook Bay at the mouth of Kilchis River.


Tow-er-quot;ton--on Hoquartan Slough just west of the town of Tillamook.

Chuck-tin--at the entrance of Tillamook River into Tillamook Bay.

Two villages of two houses each on each bank of the Wilson River near Chish-ucks.

A village on Netarts Spit (Taylor 1974a:76).

A village near Oceanside along the coast south of Tillamook Bay (Taylor 1974a:45).

Nestucca

Synonymy: Apasun, Nas-tou'-kin-me' tünne, Naz-tou'-o-me' tunne, Nestackee, Nestockies,
Nestuca lips, Nestucaus, Nestuccas, Nestuca, Nestuckah, Nestuckers, Nestucksia,
Nestucas, Nestrucks, Neztucca, Neztucca, Nikas, Nikas, Nistokiampasamin (Luckiamute
name), Shibalta, S1 ni'-te-ii, Siga'ush, Tachahosh (own name), Tcnel-k'qu (Alsea
name) (Hodge 1910:57).

South of the Tillamook proper were the Nestucca who formerly lived on and near the
Nestucca River. Taylor (1974a:45, 76) identifies two sites: one on the bluff overlooking
Nestucca Bay, and another at the southwestern end of Sand Lake, which may have been a waterfowl hunting area.

The Nestucca were placed on both the Grand Ronde and Siletz reservations. In 1881, 46 Nestucca were identified (Hodge 1910:67).

Salmon River

**Synonym:** Ci'-cin-xau', Kaouaï, Kowaï, Tsän tcha'-ishna amñm (Luckiamute name) (Hodge 1910:418).

The Salmon River Indians once occupied the coastal lands between the Nestucca and the Siletz divisions. As cited earlier, Haswell noted natives in this area in 1788. Although not many specific site locations are known, a well-defined Indian trail linking the Coast and Willamette Valley is reported along the Salmon River. As Suphan (1974:237) points out, "either the Yamhill (Kalapuya) would visit the coast to trade, at which time they would fish, or the Tillamooks would cross over to the Grand Ronde-Sheridan sector to trade." By 1863, the Salmon River Indians were on the Grand Ronde Reservation (Hodge 1910:418).

Ethnographic information on Tillamook aboriginal lifeways was derived from Barnett's (1937) cultural element distribution list obtained from a Salmon River informant in 1934.

Siletz

**Synonym:** Ciletse, Neselitch, Sai-leet', Sai-leet'-ic-me'-tünne, Tsäh Shnóosh amñm (Luckiamute name) (Hodge 1910:572).

The Siletz were the southernmost Salishan division along the coast. Their former territory included the area about the Siletz River. Barrowman (1937:39) notes that the Siletz were a small "tribe" who adjoined the Yaquina to the south in the vicinity of Otter Rock, and suggests that their northern boundary was probably not far north of the Salmon River. One village is reported by Vaughn (in Suphan 1974:227-228) who was traveling in this area in 1851:

> We came to a small bay and came upon an Indian village of the Tillamook tribe . . . forty miles below the Tillamook proper. The Indians called it Neslats (Siletz).

Following the establishment of the Coast (Siletz) Reservation in the mid-1800s, the Siletz name was extended to all groups of Indians living there, including Athapascons, Yakons, Kusans, and others. When Oossey (1890) visited the reservation in 1884, he was told that the people who had earlier lived along the Siletz River were extinct.

**Subsistence**

In the exploitation of food resources and technologies, the Tillamook differed very little from their Alsea neighbors. Being fisher-folk, their subsistence activities were largely oriented toward water resources. Lewis and Clark (Thwaites 1905:3:325) observed the importance of fish in the Tillamook economy:

> In Salmon Season they caught great numbers of that fish in the Small creeks, when the Salmon was scarce they found Sturgeon and variety of other fish thrown up by the waves and left by the tide which was fine. Elk was plenty in the mountain, but they could not kill many of them with their arrows.

Grabs, clams, mussels, barnacles, and octopus were harvested in quantity from the bays, estuaries, and coastal tide pools. The numerous shell middens found throughout the area along the coast tend to substantiate the reported significance of shellfish and other marine resources as described in the ethnographic record.

Seals and sea lions were harpooned or clubbed on off-shore rocks, and sea mammal carrion, such as that of beached whales, was salvaged whenever possible. This was well documented by members of the Lewis and Clark party when they visited the site of a stranded whale at Cannon Beach in 1805 (Thwaites 1905).

Birds were also hunted on the bays and small lakes (e.g., Sand Lake) along the coastline or harvested from the headlands and off-shore rocks, as described by Vaughn in 1852 near Netarts Bay:
The Indians were picking and cleaning a lot of young shags [cormorants]. They had been outside the bay to the large rocks where they nest and hatch their young. Just before they are large enough to fly the Indians go out in their canoes and catch large quantities of them; also lots of eggs (quoted in Suphan 1974:225).

Brant, coot, various ducks, seagull eggs, and other fowl have been reported as food resources in the ethnographic and archaeological records for this area (Barnett 1937; Taylor 1974a).

While elk and deer were plentiful along the coast and in the river valleys, hunting apparently played a minor role in the economy. Elk pitfalls, deer mask decoys, collective drives, and additional hunting techniques were described for the Tillamook (Barnett 1937:164-165), but Suphan's (1974) native informant insisted that game merely supplemented the largely marine diet.

Meat, skins, and camas were exchanged by the Kalapuya for seafoods from the Tillamook via the coastal/interior trade routes. Roots, berries, and fruits contributed significantly to the Tillamook diet as they did for all groups in this region. With the exception of camas and Oregon grapes which were apparently not locally abundant in the Tillamook area, the same plant resources were utilized by the Tillamook and the Alsea. (These have been discussed earlier for the Alsea.) Barnett's Salmon River informant also reported the use of seaweed for salt (Barnett 1937:165).

The principal subsistence activities of the Tillamook were carried out near the permanent or semi-permanent villages. Local areas were most heavily exploited, probably as a matter of convenience, although some Tillamooks occasionally ranged further afield during special fishing, hunting, or collecting expeditions. Wilkes (1849) noted Tillamook fishing at Astoria in 1841; Boas (1896) reported northern Tillamook hunting and fishing along the Salmon River. The Nehalem and Clatsop jointly exploited the Necanicum River near Seaside for fishing, berry collecting, and hunting (Suphan 1974). Their range inland was hampered by the rugged terrain and dense forest, suggesting that a large portion of the interior was never utilized.

Exploitation of food resources was determined to a large extent by seasonal availability. Vaughn in December of 1852 learned that "the Indians had all been up the river [Nehalem] to their old fishing ground drying salmon [probably steelhead] for winter use and that they were still living there [their village near the mouth of the Nehalem River had been abandoned]" (Suphan 1974:228). Summer and fall fishing and berrying, and fall to spring shellfish gathering generally characterized the coastal seasonal round (Harger 1972), although numerous species of fish and game could be taken year round to augment diminishing supplies as needed. It appears that few people were more favored in the abundance of native foods than those living along the western coast.

Technology

An extensive list of tools and techniques employed by the Tillamook for various activities is provided by Barnett (1937) in his culture element distribution for the Oregon Coast. Because many of these have been described for the Alsea, who shared many similar economic activities, only the more characteristic elements will be included here.

Large weirs (dams) were constructed in the estuaries to channel fish into smaller traps where they could be speared or clubbed. Fishing equipment included scaffolds, fir or willow basketry traps, salmon baskets, gill nets, dip nets, fish harpoons with antler or bone toggle heads, clubs, gaff hooks, and sharp angled hooks. Grooved stone sinkers and net floats were reportedly used with the large gill nets. Double-barbed harpoons, deer head decoys, game pits for elk, and snares were used for large mammal hunting. Bows were generally made of yew (taken from the "stormy side" of the tree, i.e., east or south), or vine maple (which was considered to be inferior); arrows were usually tipped with stone (including obsidian), although bird arrows were simply blunted wood. Dogs were also used in the hunt. Straight digging sticks with cross piece handles were used for root and shellfish harvest.

Numerous containers were made for collection and food preparation, such as coarse wooden burden baskets, fine-meshed (pitched) water buckets, tule sacks, and open-tined baskets often with tump-lines. Elk hides sunk in pits were reported as being used for the heated stones method of cooking, instead of baskets.

Household utensils included folded bark cooking vessels, portable stone mortars and pestles (sometimes ringed at the top), sea lion bladder oil containers, wooden bowls and
platters, maple spoons, cobbler choppers, and mussel-shell knives. Additional implements included fire-drills with slow match made of coiled rope or a willow stick, whalebone seats, wooden or unshaped stone mauls, and horn wedges.

High-prowed "Chinook" type canoes and simple dugouts were hollowed by alternately burning and scraping a cedar driftwood log. A hole was often drilled through the bow of Tillamook craft so that they could be tied up to a stake or dragged. Pointed poling rods, single-pointed paddles with notched blades, and bark water-balloons were used in conjunction with the canoes. A launch ceremony first initiated a new canoe, and canoes were destroyed at the death of an owner.

**Material Culture**

The winter or permanent villages of the Tillamook consisted of multi-family lodges constructed over deep excavated pits. Clark (Whittles 1905:3:274) describes the houses he observed in 1805 at a village along the northern coast jointly shared by Tillamook and Clatsop as:

built on the S. exposure of the hill, Sink into the ground about 4 feet the walls roof and gable ends are of Split pine [cedar] boards, the doors Small with a ladder to descend to the inner part of the house, the fires are 2 in the middle of the house their heads are all around raised about 2 feet from the bottom floor all covered with mats and under those heads was stored their bags baskets and useless mats.

This description generally matches that provided by Barnett's Salmon River informant over 125 years later, with the following features added: dirt walls and floors were mat lined; a tied ring ladder was used to descend from the rectangular entry at ground level; each family had a separate fire which was often lined with stones; mat or hide partitions separated living areas; and each house was named (Barnett 1937:161-162). Rectangular grass houses excavated to their full height with gabled plank or shingled roofs were also reportedly used by the Tillamook year round. Whether this latter structure was built away from winter villages, such as at fishing stations, is inadequately documented.

Other structures used by the Tillamook included underground sweat houses which were usually excavated into a hillside and plank roofed, and also the Plains-type sweathouse of brush and mats which was constructed for use away from the permanent village. Winter drying structures of brush or grass were built and used on an individual basis.

**Clothing and Adornment**

Women generally wore a fringed buckskin or fiber apron and cape, while men wore fiber shorts and capes of fiber, otter skin, or deerskin. Moccasins, leggings, and fur or bird skin headgear were additionally worn in cold weather. Hair of both sexes was worn long in two side clubs which were often wrapped with strips of mink or otter skin. Facial hair, including eyebrows, were plucked. Arm tattoos, non-ritual face paint, and ear lobe and rim piercing were also described for these people.

The Tillamook flattened the head of each free-born infant. Lewis and Clark (in Taylor 1974:41) provide an interesting discussion of head flattening among the Tillamook and other northwestern Indians which follows:

**Soon after the birth of her child, the mother anxious to procure for her infant the recommendation of a broad forehead, places it in the compressing machine where it is kept for ten or twelve months; though the females remain longer than the boys. The operation is so gradual, that it is not attended with pain; but the impression is deep and permanent. The heads of the children, when they are released from the bandage, are no more than two inches thick above the upper edge of the forehead, and still thinner above; nor with all its efforts can nature ever restore its shape; the heads of grown persons being often in a straight line from the nose to the top of the forehead.**
Socio-Political Organization

The Tillamook occupied villages which were politically autonomous except in time of war and other such major undertakings (Taylor 1974a:69). Each village was usually composed of members of extended families related by marriage, plus their slaves. Marriages were arranged with women from outside the village who came to live with their husbands. The village was headed by a local chief who was the wealthiest man; inheritance of office was largely determined by wealth and personality. Almost every man in the village was related to his chief. The powers of the chief were limited to village matters, and the chief generally acted as an arbitrator in village disputes. Secondary chiefs were also recognized for special occasions, such as in times of war. Chiefs were aided by a village council.

At least three social classes were recognized: chiefs, commoners, and slaves. Social rank was determined in large part by wealth. Slaves were taken prisoner in warfare or raids on other coastal groups, or they were purchased. Orphans or illegitimate children could also be classed as slaves if they were not adopted by kinsmen. Slaves were not allowed to plant the head of their children. The Tillamook actively engaged in slave raids as is noted in the following account by Lee and Frost (quoted in Dennis 1930:163):

A band of Tillamooks go to the south, and falling in with a weaker clan of their southern neighbors, they make no further ado, but fall upon them, gun and knife in hand; some they kill, the remainder they take prisoners, and carrying them to the north, and selling them to their Clatsop, Chinook or Checalth neighbors when they become slaves for life, and their children after them.

Status was largely defined on the basis of wealth/property. Densitum and clamshell discs were the principal recognized currency. Densitum (often incised) was graded on finger creases or on the length of a 10-shell string; clamshell discs were measured by fathom lengths. Obsidian blades (black, red, green) and woodpecker scalps, probably gained through trade networks with California, were also recognized as status items.

Political Alliances

The socio-political history of all western aboriginal people is closely related. Marriages were arranged between Tillamook villages and their Clatsop and Alsea neighbors. Travel and trade, seasonal hunts and fishing, and winter dancing/socializing took people north and south of their home villages. Well defined trails along the coast from Tillamook Head to Tillamook Bay, over Tillamook Head, and around Neahkante Mountain linked coastal people as did riverine canoe transportation. Travel routes to the Willamette Valley and to Sauvie's Island via the Wilson River/Gales Creek trail and the Salmon River trail joined the coastal and interior Indians in trade and other socio-economic activities (Suphan 1974).

Religious Beliefs

The central religious figures among the Tillamook were the shamans, who used the powers of their guardian spirits for a variety of purposes, including curing, controlling the weather, and foretelling events. Either sex could become a shaman, although the majority were women. Shamans received their special powers during individual spirit quests at specific locations and through dreams; an intensive training period followed. A shaman's spirit power could be evil (e.g., waterdog, thunder, lightning), or good (e.g., birds, mountains).

Various ceremonies, feasts, and dances were held throughout the year. First salmon rites were observed with the fish bones being thrown back into the river. Life cycle events such as a girl's first menses, marriage, and death received prescribed ritual attention. "Good time" dances (without sacred connotation) were given by wealthy men during the winter months, and other villages attended, later to reciprocate with dances at their village.
The art of the Tillamook, as with the other northwest Oregon cultures, has received little attention by anthropologists. Canoe prows were known to have been carved and sometimes painted, but otherwise, documentation is sparse. Deerhoof rattles, roof plank drums (used especially for gambling and healing events), bird bone whistles, and musical bows have been attributed to the Tillamook for use during special events such as healing and purification rites, and in gambling.

CHINOOK

The Chehalis term *Chinook* has been variously applied by different authors to identify (1) a specific village location on the northern shore near the mouth of the Columbia River; (2) a cluster of local villages in the same area of the Lower Columbia River; and (3) all native peoples formerly occupying lands along the Columbia River west from The Dalles who spoke one of two known dialects of the Chinookan language (Ray 1938). For the purposes of this study, the last definition of a collective Indian identity will be followed.

At the time of contact, Chinook territory extended along both banks of the Columbia River from about six miles east of The Dalles to the Pacific Ocean, and along the coast from Shoalwater Bay (Washington) south to Tillamook Head (Oregon). Chinookan peoples additionally occupied the Lower Willamette Valley to the present site of Oregon City and east along the Clackamas River to the foothills of the Cascades. Except for a small area along the Columbia River near the Coast Range occupied by Clatskanie on the south shore, and the Cowlitz and Klickitat north of the river, the entire Lower Columbia Valley was the territory of a linguistically and culturally similar people. The Columbia River, which was the only navigable waterway extending to the interior between British Columbia and California, fostered an extraordinary development of commerce between coastal and inland Indians, and a remarkable cultural homogeneity among peoples extending over 200 miles.

Ethnographic and historic sources on the Chinook are numerous. Among the published anthropological sources, the most often consulted include Boas (1894, 1901, 1910), Jacobs (1905, 1909, 1960), Ray (1937, 1938), Taylor (1974b), and Suphan (1974). Unpublished manuscripts of particular note for their additional ethnographic information include Wuerch (1979), Woodward (1974), and Peterson (1978). Many travelers west of the Cascades prior to the 1850s mention the Chinook. Among these valuable historic resources are the Lewis and Clark Journals (Twaftes 1905; Coues 1893), Gass (1904), Frechon (1967), Rives (1906), Strong (1906), Swan (1972), and Ruby and Brown (1976). Curtis’ work (1911, including folios) contains some of the finest photographs available of the Chinook; Kane (1971) provides illustrative sketches and notes.

**Settlement Patterns**

When the Lewis and Clark Expedition descended the Lower Columbia River in 1805, they were seldom out of sight of Chinook villages. Over 150 sites have been identified within Chinook territory (Saleby, personal communication). Many of these semi-permanent or winter villages followed a linear settlement pattern in that they were situated along the banks of major rivers and their tributaries, especially at their junctions. Villages tended to be located with accessibility to fresh water, a matter of importance in areas affected by tidal water, and near productive fishing sites and hunting-gathering areas. The major rivers throughout the general region served as avenues for water transport, linking autonomous villages in trade and communication, and for food resource exploitation.

Along the Lower Columbia and the Pacific coast, the Chinook year tended to follow a biseasonal subsistence pattern. While the permanent village may not have always been completely abandoned during spring to fall months, there is evidence that the majority of the villagers left at some time to join in the fishing, hunting, collecting, trading-gambling-socializing activities at areas distant from their home village. At those times, the settlement pattern changed from a linear river oriented arrangement, to scattered temporary camps located near the activity area. As with winter village locations, many of the summer sites were adjacent to food resources and to water; others were established at trading and social centers such as Willamette Falls, Atlatl Valley (near The Dalles), and later at Fort Astoria/Fort George.
The use of rockshelters and caves, either for temporary or seasonal shelter, is inadequately documented in the ethnographic literature for the Lower Columbia River.

The Chinook have been variously subdivided by dialectal and geographic features in the anthropological and historic literature. The seven major divisions presented below for the area encompassed by the Salem District, follow the general scheme provided in Figure 6. Each division is briefly discussed, with villages and population data provided, when available. A synonymy of names previously used to identify each division is also included.

Clatsop

Synonymy: Calt-sops, Chatsops, Cladsaps, Clap-sott, Clatsaps, Classops, Clatsaps, Clatsop's, Clatsops, Clatsops, Clatsup, Clatsup, Slot sop, Klaat-sop, Klatrops, Klatops, Klatsops, La'k'tolak (own name), La'k:glq (Upper Chinook name meaning 'dry salmon'), Latsop, Satchap, Tiatsap, Tschlahtsopstks (Hodge 1907:305).

The Clatsop occupied a number of villages on the south bank of the Columbia River near its mouth, from the coast east to Youngs Bay, and south along the coast to Tillamook Head. Lewis and Clark, who wintered over among the Clatsop in 1805-1806, report that some southern villages were shared by Clatsop and Salishan Tillamook (Thwaites 1905:3:321). The journals of the expedition furnish an extensive account of Clatsop lifeways. Two hundred members of the "Clatsop Nation" were reported for 1806; only 50 were listed by Lane for 1850, probably reflecting the effects of the malarial epidemic which swept through the area about 1850 (Schoolcraft 1853:571, 632).

Villages (after Suphan 1974:204-206)

Ny'sma spu—south of Astoria on Youngs Bay, at the mouth of the Walluski River.

N' ti—at the mouth of the Lewis and Clark River.

Skepinam—about 4 miles below N' ti, at the mouth of Skipanon Creek.

Naiyaskta—about 11 miles above Fort Stevens, near Hammond.

Kunupi—about one mile above Fort Stevens. Farrand (in Hodge 1907) gives it as Konpe, near the mouth of the Columbia, while Boas (1894:274) indicates it as upriver from the following settlement.

Hlatsop—at Fort Stevens, Boas gives it in the Clatsop dialect as La tšk, and it is from this village that the entire division derives its name.

Niakewankih—according to Farrand (in Hodge 1910), this village was on what is now Newanna Creek; Smith and Labonte call it Neahkowin. Boas calls it Niakewanki, "the middle village" of the Clatsops.

Neacox—-a winter village at the mouth of Neacoxie Creek.

Necotat—-at Seasido, identified as shared with the Tillamooks.

Ta tčap—-at what is now Camp Clatsop; this is shown on the Lewis and Clark map as being on the beach at the mouth of a stream.

Lia Menalucta—located on a lake below Point Adams.

Cuthlamet

Synonymy: Cathlamet, Cath Cameutes, Cathlametts, Cathlamah, Cathlanak, Cath-la-mas, Cathlamats, Cathlamet, Cathlamuts, Cathlamux, Cathlawah, Cathlumet, Cathlamas, Cuthlamuhs, Cuthlanuks, Guasamas (Clackamas name), Guithlameth, Kathlamet, Kathlamet, Kath-lamet, Kathlumit, Kathlamut, Kialamak, Kathlamet, Kathlamets, Kwillu'chihin (Chinook name) (Hodge 1907:216-217).
Immediately upstream from the Clatsop, and believed to have originally belonged to them before settling into separate villages, were the Cathlamet (Ruby and Brown 1976:6). The Cathlamet reportedly spoke the Upper Chinook dialect linking them with Chinookan peoples further upstream. At contact, they occupied lands along the south bank of the Columbia River from about Tongue Point to the vicinity of Puget Island (Farrand, in Hodge 1907:216). Two villages were reported in this area, and at least one village has been identified as Cathlamet on the north shore (Suphan 1974:215; see Strong 1906). Suphan (1974:215) notes that "at various points along the south shore from about Tongue Point to the mouth of the Clatskanie River, fishing camps were established and hunting and gathering areas exploited," in addition to utilizing islands in the Columbia for the same purposes.

Lewis and Clark (Thwaites 1905) estimated about 300 Cathlamet in 1806; by 1849, only 58 were reported by Lane (Schoolcraft 1851), and they are now believed to be extinct. The following Cathlamet villages have been reported in Suphan (1974:216-217).

**Villages**

Kahlasmat (Klathamak, Kalamat)--located on the south side of the Columbia River near Aldrich Point.

Hillusqahin--near present Knappa behind Karlson Island, about eight miles above the John Day River.

**Skilloot**

**Synonymy:** Caloot, Caloot, Caloort, Chloot, Kolnit, Kreelwits, Skillows, Skilloot, Skeltute, Skiltutes, Skillutts (Hodge 1910:591); Kre-lult, Hilt-111-luk (Barry 1927:55).

Lewis and Clark (Thwaites 1905) reported the Skilloot "tribe" in 1806 living on both sides of the Columbia River around and opposite the mouth of the Cowlitz River (Washington). Linguistically, they are reported to have spoken the Upper Chinook dialect of the Chinookan language. Other than occasional mention in the Lewis and Clark Expedition journals and by Franchere (1967), who called them the "Kreelwits," little is known about their land utilization practices. In 1806, an estimated 2500 Skilloot existed; by 1890, Lane reported only 280 living in the area (Farrand, in Hodge 1910:591).

**Villages**

Coonias--at Oak Point on the south side of the Columbia River, below the mouth of the Cowlitz, in Columbia County. This "was their principal village in later times" (Swanton 1952:442).

Kat-la-gu-lak or Tie-gu-lak--two miles below Rainier, Oregon (Barry 1927:55).

Telakchoo--three miles above Oak Point (Barry 1927:55).

Coo-ni-ac or Whill-wetz--from Prescott to Oak Point, near Quincy, Oregon (Barry 1927:55).

**Multhomah**

**Synonymy:** Maltanab, Mathlanobes, Mathlanobs, Maltinasa, Mulnotans, Multinoma, Milt-o-nah, Multonma, N2nmalonax ("down river") (Hodge 1907:956).

Lewis and Clark originally used this term to identify the Chinook peoples living about the upper end of Sauvies Island and the adjacent mainland (Hodge 1907:956). The term has subsequently been extended to all Chinook groups formerly living south and east to about the Willamette River, including the Clannaquah, Wappatoo, and Cathlapotle divisions designated by Lewis and Clark (Thwaites 1905).

This area was one of the most severely impacted by the "intermittent fever" epidemic in the early 1930s. The number of village sites known suggests an unusually high population density prior to the epidemic. The Multnomahs, sometimes called the "Middle Chinook"
(Gatschet 1877; q.v., Wuerch 1979) are generally identified with the Upper Chinook dialect division.

Villages

Cathlacomatup—south side of Sauvies Island on a slough of the Willamette River (Swanton 1952:467; Hodge 1907:216); Barry (1927:55) describes the site near Harborton on the mainland.

Cathlacomump (=Cathlacomumps, Cath-lit-cum-up)—west bank of the lower mouth of the Willamette River and claiming as their territory the bank of the Columbia from there to Deer Island (Hodge 1907:216; opposite Point of Rocks (Barry 1927:55).

Cathlanaquah (=Cath-la-nah-quah, Gat-la-na-koa-qq)—southwest side of Sauvies Island, near Burlington (Hodge 1907:217). Wyeth established Fort William at this place in 1835, but all the Indians of the village were then dead (Barry 1927:54).

Clehaquah (=Clannahahquah, Clan-nah-queh)—on the Columbia side of Sauvies Island near Willow Point (Barry 1927:54; Swanton 1952:467; Hodge 1910:913).

Claninata (=Clah-in-na-ta)—on the southwest side of Sauvies Island (Swanton 1952:467); near Point of Rocks on the mainland west side of Multnomah channel (Barry 1927:55).

Kathlamaximin (=Clannahaximmim, Kathlamaximin)—at south end of Sauvies Island, later associated with the Cathlacomump and Nemeit (Swanton 1952:467); opposite Scappoose (Barry 1927:55); principal village on southwest side of Island in the Willamette River (Hodge 1907:964).

Multnomah (=Mathlanobs)—on the upper end of Sauvies Island near Reeder Point (Hodge 1907:956).

Nemalquinner—at the falls of the Willamette River, but with a temporary house on the north end of Sauvies Island (Swanton 1952:467); Barry (1927:54) places this village near St. John's.

Na-mo-it (=Naw-moo-it)—village cited by Barry (1927:54) on Sauvies Island near Warrior Rock.

Kase-nois village—"was supposed to have been near Scappoose" (Barry 1927:55).

Clowewalla


These Chinookan peoples formerly resided at Willamette Falls in the Lower Willamette Valley. At this site was a major regional fishing and trading center. The Clowewalla are reported to have been a large and important group prior to the epidemic of the 1830s, but were greatly reduced in numbers by this disease. To the south of Willamette Falls were various groups of Kalapuya speakers, with whom the Chinooks married and traded. By 1851, only 13 Clowewalla were reported, living at that time on the west bank opposite Oregon City. The surviving Chinook in this area were later assigned to the Grand Ronde Reservation after signing the Dayton Treaty of 1855 (Farrand, in Hodge 1907:313). Swanton (1952:458-469) suggests that the Cashooks, who resided just below the falls on the east bank of the Willamette River, and the Clacowahs and Nemalquinner noted by Lewis and Clark in 1806 may be included with the Clowewalla division.

Villages

Walamt (=Charcoma)—on the west bank opposite Oregon City (Barry 1927:54).

Clowewalla—on the east bank just above Willamette Falls (Barry 1927:54).
Clackamas

Synonymy: A'kimash (Tualatin name), Clackma, Clackamis, Clackamos, Clackamurs, Clack-a-mus, Clackanurs, Clackernes, Clackamus, Clakemas, Clarkames, Clarkamos, Clarkamus, Clukomus, Gitag'ëmas (Clatsop name), Guithila'kimas (own name), Klackamas, Klackamus, Klakamuss, Klakamat, Klakimass, Nékau's (Nestucca name), Ns tiwat (Nestucca name), Sehalatak, Thlakemas, Tlakiminsh (own name), Tlakimish-pum, Tōlhó tane (Hodge 1907:302).

The Clackamas peoples claimed the country on the east side of the Willamette River from a few miles above its mouth, nearly to Oregon City and east along the Clackamas River as far as the Cascade Mountains (Hodge 1907:302). In 1806, Lewis and Clark (Thwaites 1905) identified 1800 of the "Clackamis Nation, on a large river of the same name." By 1850, the Clackamas were reduced to 60 (Schoolcraft 1857:701). Fifty-nine "Clackama" were reported on the Grand Ronde Reservation in 1889 (Powell 1891:66).

Clark (Thwaites 1905:4:241) reported eleven villages along the Clackamas River, but he was unable to elicit precise locations from his Indian informant. Only the Gladstone village near the mouth of the Clackamas River below Willamette Falls is reported (see Woodward 1974).

Cascades


The name Saxala was given by Lewis and Clark to the Chinook Indians living between the Willamette River and the Cascades. Farrand (in Hodge 1910) identifies these people as Sháhala; Swanton (1952) chose to use the term N̓atšila. The Lewis and Clark party estimated their population to be about 2800 people in 62 houses. There is considerable confusion as to the location of village sites. The following have been proposed by Hodge (1907, 1910), Swanton (1952), Curtis (1911), and Barry (1927).

Villages

Cathlakaheckt--at the Cascades (Hodge 1907:216).

Cathlalala--just below the Cascades, near Bonneville (Barry 1927:54).

Claheclellah--near the foot of the Cascades, probably on the north side of the river (Hodge 1907:302).

Neerchokloon--on the south side of the Columbia River, a few miles above Sauvies Island. Barry places this village near Alderwood Country Club (Hodge 1910:49; Barry 1927:54).

Nechacoohee--on the south bank of the Columbia, a few miles below the Sandy River near Troutdale (Barry 1927:54).

Washougal--near the Sandy River (Swanton 1952:476).

Yehuh--just above the Cascades (Swanton 1952:476).

Swapapani--at Eagle Creek (Curtis 1911:8:181).

Additional Divisions

Further upstream from the Cascades were the Dog (Hood) River and Wasco divisions of Upper Chinook along the south bank of the Columbia River. Opposite the Wasco on the north shore were the Wishram, who were the residents of Atlatl Valley, the largest trade center along the Columbia in historic times (often referred to as at The Dalles). Many additional villages lined the north shore between the Wishram and the Chinook proper at the mouth of the Columbia River (see Spier 1936; Roy 1936; and Lewis 1906).
Subsistence

Along the Lower Columbia River the varied habitats and mild climate offered abundant year-round food resources to the Chinook inhabitants. Numerous early writers confirm the availability and exploitation of various plant and animal products, including John Boit (1942:399) who observed in 1792 that "the river abounds with excellent salmon, and most other river fish, and the woods with plenty of moose [elk] and deer, the skins of which was brought up in great plenty, and the banks produces as ground nut, which is an excellent substitute for either bread or potatoes."

Of great importance to the Chinook economy were the varied marine products. Five species of salmon are known to have annually ascended the Columbia River and its tributaries in three major runs. Steelhead, sturgeon, smelt (eulachon), and lamprey eels were also plentiful in major streams. Along the coastal beaches and bays occupied by the Clatsop and Chinook proper, clams, crabs, and mussels could be collected in quantity. A beached whale was highly prized for its oil and blubber. Aquatic mammals such as seals and sea lions, sea otters, and porpoises were occasionally speared along the coast or on the Lower Columbia River (Ray 1937; Thwaites 1905; Swan 1972).

Besides the abundant marine resources, land-mammals were hunted, including elk, deer, bear, bobcat, cougar, raccoon, squirrel, mountain beaver, rabbit, and porcupine (Ray 1938). Islands in the Columbia were exploited for fur-bearing animals such as beaver, muskrat, mink, and river otter. The Pacific migratory flyway, extending the length of the Willamette Valley, brought large numbers of various species of breeding and wintering birds to the area. Waterfowl and game birds utilizing the areas about the water courses, marshes, and lakes were captured, yielding geese, swans, ducks, grouse, and quail.

The mild, moist climate encouraged the lush growth of edible plant species providing greens, roots, berries, nuts, and fruits. Ray (1938) includes nearly 30 vegetal foods utilized by the Lower Chinook; Swan (1972) noted the edible plants available to the Chinook near Shoalwater Bay; Gunther (1972) and French (1966) provide additional information as to identity and use of northwest plant foods. Camas was available throughout the entire area, but the extent to which camas was a staple food is uncertain. Barry (1930) notes that camas grew in such quantities in some locations that enough could be harvested in a few days to last for the entire year. The root of waspato, which grew in the shallow lakes and marshes about Sauvies Island and the Lower Willamette Valley, was highly prized by all. Its limited occurrence made it the principal article of trade between coastal and inland Chinook. Barry (1930:46-47) describes how waspato was gathered:

The Indian women fastened a basket on their backs, by means of a strap around their foreheads, and waded in the water. They loosened the mud around the bulb with their toes, and the plant floated to the surface. The bulb was then broken off and thrown over the head into the basket.

Where the water was deep, the women used a small canoe, and lowered themselves into the water. The abundance of the waspato in this vicinity [Portland Basin] is shown by the fact that 100 canoes used for this purpose were seen in one day by members of the Lewis and Clark Expedition.

Other plant foods extensively utilized included the roots of lupine, bracken fern, horsetail rush, thistle, cattail, skunk cabbage, and cow parsnip; numerous berries including salmonberry, and huckleberry; and crabapples, acorns, and various plant shoots.

The annual cycle of subsistence activities of the Chinook was in response to the seasonal availability and location of the desired food items. Lewis (1906:15) noted that the tribes of northwestern Oregon "wandered about considerably, according to the season, hunting berries or game in the mountains, gathering roots in the plains and swamps, and catching and curing fish at their favorite fishing places along the coast and rivers." Ruby and Brown (1976:6) suggest that the Lower Chinook lived essentially in a biseasonal world. Fladmark (1975) recently proposed that a biannual subsistence cycle was practiced by all Northwest Coast cultures. In this scheme, the first period is a time of resource exploitation of varied items, during which the village members are dispersed into small task groups. Temporary camps are set up near resource areas; from these camps fish, sea mammals, and berries would be harvested during the spring and summer, followed by salmon-fishing activities through the fall. The second period, marked by the reassembling of villages, was characterized by redistribution of resources as well as hunting, fishing, and collecting of shell fish in order to supplement diminishing stored winter supplies.

The Chinook seasonal round probably centered on the three major salmon runs in the Columbia River. The first salmon entered the area during January to March; the second,
and choicest, from May to early July, and the third from late July to October (Ray 1938). The majority of fishing stations were close to villages, but other productive sites more distant were also owned or rented, such as at Willamette Falls on the Lower Willamette River (Supahan 1974:191). Drucker (1965:13) states that:

In a comparatively few days including the time it took him to ready his harpoons, nets, and traps, to repair the smokehouse and to do his share in building the weir, a man could catch and his wife could prepare enough salmon to feed his family for several months, thus providing him with leisure.

Lewis and Clark noted a run of eulachon or smelt, which they called "anchovies," along the Columbia River. These fish, spawning in glacial streams, were caught in abundance as they ascended the Sandy, Cowlitz, and Lewis rivers about February. Eel were fished in the spring and steelhead trout in the fall. Additional fish could be taken from smaller streams and lakes throughout the year.

Large mammals were generally hunted in the fall when they were in full flesh and thick pelage and congregated in herds in the lower country. Fur seal hunting was reported during their seasonal migration in December and spring (Ray 1938:113). Plant foods were gathered from early spring when the first shoots of camas, salmon berry, and cow parsley appeared, through the fall with the major harvest of wapato in September. Franchere (1867) reports that berries were available along the Lower Columbia into December.

The range of habitats successfully exploited by individuals, groups, or commonly shared by several local villages, is yet poorly understood. Supahan (1974:200) has suggested that vast areas of land were not used; he cites strong regarding the Indian fear of forests:

Some parts of it he knew well, but into other parts he would not go and it was curious to see how the places where game and food were plentiful became familiar ground while the other places were invested with superstitious terrors. Along the rivers where canoes could go the Indian was at home, and along some of the prairies and smaller streams of the Willamette Valley, Indian villages and homes were established, but the forest itself was untouched and except where it was hunted it was unknown and feared by the Indians.

Trade also contributed significantly to the subsistence pattern among all northwestern Oregon Indians. Dried fish, crabs, clams, and vegetal products were exchanged at Willamette Falls and The Dalles for skins, meat, beargrass, and other products brought from the Plateau and Plains. Kalapuya exchanged their well-preserved camas for fish. The Columbia River and Lower Willamette valleys appear to have served as main arteries for the exchange of numerous items. The role of Lower Chinook as middlemen in this regional trade network has been the focus of several books, notably that of Ruby and Brown (1976).

The archaeological evidence suggests that the maritime/riverine economic orientation existed for many millennia prior to Euro-American contact. Undoubtedly there have been periods in the past of abnormal scarcity and seasonal fluctuations (Suttles 1960). The specific societal mechanisms which operated at these times are not completely known, although winter redistribution of goods (e.g., potlatching) and regional trade surely contributed to the maintenance of populations. Supahan notes that during times of scarcity, Clatsop Chinook extended their range to Cascade Mountain or the Nehalem Valley (Tillamook area).

**Technology**

With fishing their principal economic pursuit, Chinook peoples utilized many effective tools and techniques for successful harvest. Nettle-fiber nets and seines of up to 600 feet in length were used in the Columbia River, while dams and weirs were placed across streams to concentrate fish for dipnetting or spearing. Large fish were speared with detachable toggle-headed harpoons or long fire-hardened spears from canoes or platforms constructed above a weir. Smaller fish, such as smelt, were collected in conical dip nets or with bone-toothed herring rakes. Sturgeon were caught on baits hooks or in nets (Ray 1938).

Tools for hunting included the bow and arrow (simple and sinew-backed), beaver harpoon (fore-shafted with pointed barb), and nets. Snares were known, but not extensively used. The techniques employed varied with the animal pursued: bears were stalked or smoked out of winter dens; deer and elk were communally driven ("circle drive"), individually stalked, or captured in pitfalls excavated on animal trails; beaver were hunted at night and
harpooned or shot; rabbits and other small mammals were netted. Dogs were occasionally used in hunting elk, according to notes made by Lewis and Clark (Thwaites 1905:4:95). Elderberry whistles and animal decoys were also employed to attract game. Waterfowl were approached by canoe with a bow and blind constructed over the canoe to resemble a pile of floating driftwood. Other equipment associated with hunting included wooden arrowshaft straighteners, quivers of sewn bear or wolf skins, and stone clubs. Ray (1938:116-118) notes that projectile points included obsidian, flint, and bone.

Domestic utensils included carved bowls, boxes, and platters of cedar, alder, ash, maple, or yew; horn bowls and spoons; and large ladles and food paddles of hardwoods. Cooking stones were used for boiling foods as described by Franchere (1967:246):

Having heated a number of stones red-hot, they plunge them, one by one, in the vessel which is to contain the food to be prepared; as soon as the water boils, they put in the fish or meat, with more heated stones on top, and cover up the whole with small rush mats, to retain the steam. In an incredibly short space of time the article is taken out and placed on a wooden platter, perfectly done and very palatable.

Many styles and types of fiber articles were manufactured. Baskets of various sizes and functional design were made of spruce root, cedar bark, willow bark, and bear-grass. Twining was the dominant technique, but checker-work (plaited) was also important. Sewn cattail mats and small plaited cedar bark mats were made by the women who collected the materials and wove most all fiber products. Openwork baskets for shellfish and salmon storage, water-tight containers of up to six gallon capacity, soft bags, and cordage were also made, generally during the winter months. Baskets were often decorated with natural or dyed materials or braid twilling. Bone (heron wing bone) or wood needles and mat crossers aided the manufacture of fiber items.

Mussel shell knives, beaver teeth engravers, bone awls, straight adzes with shell, bone, or iron blades; wood or horn wedges; and wooden mallets served numerous tasks. Ray (1938:136) states that mortars were made only of wood and were circular in shape and sometimes ornamented; pestles were of wood or stone (see also the recent thesis by Peterson [1978] as a discussion of Lower Chinookan mobile aboriginal stonework).

Material Culture

Canoes

With simple stone, bone, tooth, and shell tools combined with controlled use of fire, craftsmen fashioned cedar canoes of up to 50 feet in length, capable of transporting as many as 40 people (Strong 1906:12-13). Several types of canoes were made, including the large high-proved Nootka or Chinook canoe, two "cutwater" canoes, and at least three hunting craft (cf. Olson 1967; Ray 1938). Each canoe design solved certain problems of river, lake, or ocean travel. Franchere (1967:246-247) provides these observations:

Their canoes are all made of cedar, and of a single trunk: we saw some which were five feet wide at midships, and thirty feet in length; these are the largest, and will carry from 25 to 30 men; the smallest will carry but two or three. The bows terminate in a very elongated point, running out four or five feet from the water line. It constitutes a separate piece, very ingeniously attached, and serves to break the surf in landing, or the wave on a rough sea. In landing they put the canoe round, so as to strike the beach stern on. Their oars or paddles are made of ash, and are about five feet long, with a broad blade, in the shape of an inverted crescent, and a cross at the top, like the handle of a crutch. The object of the crescent shape of the blade is to be able to draw it, edge-wise, through the water without making any noise, when they hunt the sea-otter, an animal which can only be caught when it is lying asleep on the rocks, and which has the sense of hearing very acute. All their canoes are painted red, and fancifully decorated.

These same canoes often held the body and possessions of the owner after death.

Structures

Large communal houses, generally sheltering several nuclear families, were constructed at permanent village sites. Franchere (1967:247-248) also provides a fine description of these Chinook longhouses:
Their houses, constructed of cedar, are remarkable for their form and size: some of them are one hundred feet in length by thirty or forty feet in width. They are constructed as follows: An oblong square of the intended size of the building is dug out to the depth of two or three feet; a double row of cedar posts is driven into the earth about ten feet apart; between these the planks are laid, overlapping each other to the requisite height. The roof is formed by a ridge-pole laid on taller posts, notched to receive it, and is constructed with rafters and planks laid clapboard-wise, and secured by cords for want of nails. When the house is designed for several families, there is a door for each, and a separate fireplace; the smoke escapes through an aperture formed by removing one of the boards of the roof. The door is low, of an oval shape, and is provided with a ladder, cut out of a log, to descend into the lodge. The entrance is generally effected stern foremost.

Dimensions and details of construction varied considerably between villages, but large rectangular structures with vertical wall planking, gabled roof, and horizontal roof planks were common throughout the area. Of note is a house type observed by Lewis and Clark (2010:3:196) at a Skilloot village, "thatched with straw and covered with bark." Clark (Thwaites 1905:3:183) noted numerous carvings in wood "generally in the figure of a man" associated with the house construction. A detailed discussion of variant house types is provided by Ray (1938:124-128).

Plank houses were used only during the winter months. In spring, the house planks were removed from the frame and stored, or transported to summer locations for use in shed- or flat-roofed structures. Other temporary summer structures of cattail mats were reported throughout the area.

Two types of sweat lodges were constructed by the Chinook. The first, a small plank structure, was erected over an excavated square about 2 feet deep and five feet across; a second resembled the typical Plains hemispherical hut made of woven mats covering a bent willow frame. Stones were heaped outside, then placed inside in a shallow depression. Proximity to water was a prerequisite for sweat hut location, as a sweat bath was followed by a plunge in cold fresh water. Sweatbathing apparently played a minor role in Chinook activities, although it was considered to be a means of curing minor ailments (Ray 1938:127).

Dress and Adornment

During periods of cold weather a fur robe was hung over the shoulders. Sewn sea otter, mountain beaver, raccoon, beaver or muskrat skins; tanned hides of deer, elk, or bear; or twisted fur strips served this purpose. Woven dog wool and mountain sheep blankets have been reported for the Chinook, but there are few details relating to the location and extent of manufacture. In rainy weather, small rush mat caps and basketry hats were worn by both men and women. Lewis and Clark (Thwaites 1905:3:239), as well as numerous other early chroniclers, reported shredded cedar inner bark skirts worn by women living along the Lower Columbia River. Upstream from Puget Island, buckskin breechcloths, similar to those described for the Kalapuya were also observed. Shells, beads, wrist bracelets and ankle bands, and feathers adorned both sexes. Hair was worn long, loose or braided, and often oiled. Women pricked or tattooed their legs and arms; men wore donatla or other items from the pierced nasal septum (Ray 1938; Swan 1972).

Probably the most striking physical feature of the Chinookan peoples was their fronto-occipital head deformation. Few early historic accounts fail to mention this practice of head-flattening among the Indians in northwestern Oregon. The Chinook, as well as Coast Salish Tillamook, Alsea/Yaquina, and northern Kalapuya flattened the forehead of infants as a sign of free birth, status, and beauty. Lewis and Clark (Thwaites 1905) describe and illustrate the method of head-flattening. Photographs by Curtis (1911) and portraits by Kane (1971) provide excellent additional documentation of this practice.

Social Organization

The basic social organization of all Indian groups in northwestern Oregon was centered around the autonomous village. Each village was composed of extended families—a group of related males and their wives and children, unrelated males who chose to live in their wife's village, and slaves which were obtained by purchase, war, or debt payment (Suphan 1974:189).
Village members were divided into classes based on birth and wealth factors. While clear class distinctions marked the upper class (i.e., chiefs and their families, prominent shamans, wealthy traders, or a successful warrior) from slaves, other class lines were less clearly drawn. The majority of village members made up the common class. Suphan (1974:190) reports that movement from the lower class to the upper was not uncommon; accumulation of a powerful guardian spirit or a good marriage might raise a man's rank. It should be noted that wealth was generally measured by dentoalveolaria, a small shell found in the coastal waters off the southern end of Vancouver Island and traded widely throughout the region, and other property, such as the number of slaves owned. Nager (1972:7) points out that the emphasis on wealth was directed to what it could buy (e.g., the number of wives) and what it represented (i.e., power and prestige).

Upper ranking individuals assumed leadership roles. Principal chieftainship was inherited along the male line. In this polygamous system (practiced at least by wealthy males), the eldest son of the highest-ranking wife might gain the position of chief, although Suphan (1974:190) suggests that wealth and ability have been known to override this. When suitable male contenders were lacking, women could be selected to hold the position of chief. The powers of chiefs were limited; their status was based more on influence than on authority, and they were principally looked to for advice, to mediate problems, and to guide the economic affairs of the village. Prior to white contact, a chief's influence was confined to village matters; but with the arrival of Euro-American traders and government officials, ignorant of native political affairs, the power and prestige of a chief over his village and other villages increased. An example of this was Concomly, chief of the Chinook proper, who gained tremendous influence in native regional trade by his advantageous alliance with white traders (Suphan 1974; Ruby and Brown 1976).

The practice of slaveholding has been addressed by every writer who attempted to describe Indian lifeways of the Lower Columbia River valley. Dennis (1930:295) describes the extent of slavery in this area:

To summarize: the evidence seems to show that slavery existed in large degree among all the Indians of the Pacific coast, no tribe being entirely exempt. The records of Spanish, French, British, and American explorers, navigators, and fur traders prove this fact. Indians were made slaves by war and capture, purchase, shipwreck, and gambling, and among women, by the death of the nearest male relative. The slave trade was considerable along the coast. Probably four percent of the Indian population were slaves. The price of a slave varied from a few beads to 100 blankets. Slaves were held by employees of the Hudson Bay Company, and by settlers in the Willamette Valley, both French-Canadian and American.

There is evidence that the Chinook, along with north coast Alsea and Tillamook, and Tualatin Kalapuya contributed to the regional slave trade (Zenk 1976). Slaves were held in considerable numbers by Chinook peoples and played a significant role in their economic life. Slaves gave service to their owners, as they were considered property, and at the same time performing numerous labors. Slaves were not allowed to flatter the head of their infants, thereby clearly distinguishing their low social standing for life.

**Religious Beliefs**

As with other northwestern Oregon Indians, the religious beliefs of the Chinook centered on guardian spirit powers. All children, including slaves, could seek a guardian spirit, beginning at about ten years of age and continuing through puberty. Ray (1938:76) furnishes details about this three-to-five-day vision quest:

The vision seeker embarked upon his quest early in the evening, always going alone. His destination had been specified: it was usually a body of water, or a point on the beach. In the latter case the outgoing trip was to be made largely by swimming, stopping at intervals to dive, each time in sequences of five, accompanied by shouting. This was to be repeated at the destination, but the return trip could be made by land. A point further distant was named for each successive venture. . . . The activities were not always limited to diving; sometimes putting boulders or piling them up (emphasis added) was included. The seeker carried a stick with identifying marks which had been given him with instructions to leave it at the destination so that his presence there might later be ascertained. The stick was deposited after diving, not before. Or perhaps he was told to bring back some object or plant only to be found near the specified goal.
Saddle Mountain, south of Astoria, was given as a common spirit quest destination for Lower Chinook (Ray 1938:79).

Guardian spirits were animals (e.g., birds and mammals), natural phenomena (e.g., thunder, clouds, whirlwind), and inanimate objects (e.g., rocks and water). Skunk, bear, cougar, and thunder were considered to be the most powerful of the spirit helpers. Generally all guardian spirits conferred good health, wealth, and long life, in addition to particular skills associated with each specific power. Knowledge of one's successful spirit quest was held secret.

Shamans acquired their spirit powers in the same manner, although the spirit revealed to them often possessed powers of healing. After acquiring one's spirit power in youth, a five-year training period under a shaman was begun. Males and females alike could become a shaman. Shamans were called upon by individuals to cure illness, retrieve lost souls, foretell the future, find lost articles or persons, or occasionally inflict witchcraft (Ray 1938:85-89).

Various ceremonies were held throughout the year to witness important events in Chinook life. First salmon rites were ritually held upon the arrival and capture of the first Chinook salmon each year, to assure abundant supply and the return of fish the following year. The importance of other rites of first food is imperfectly understood. Certain observances were made for an individual's first success at hunting and gathering to allow luck in future subsistence activities. Evidence of potlatching and secret societies among the Chinook reflects influence from the more northern Northwest Coast cultures (e.g., Nootka, Kwakiutl). Winter dances, feasts, and redistribution of wealth as payment for witnessing life events such as the naming of an individual, a girl's first menstruation, or death, were occasions for intervillage gatherings. The major religious ceremony was the guardian spirit dances held during the winter months to reinforce the relation between an individual and his guardian spirit (cf., Boas 1894; Ray 1938).

At death, the body was wrapped in mats or blankets and placed in a canoe or on an elevated platform, tree, or cliff niche. Several sites shared for this purpose by the Chinook were noted by early explorers and settlers. Dighton named Mount Coffin in 1792; Lewis and Clark identified Image Canoe Island (now Hayden Island) in 1805. John Gill (1928:321-322) described Coffin Rock, about 20 miles east of Mount Coffin, and noted that "until white men came, and stole these canoe-coffins, good serviceable canoes were devoted to sepulture; but to make them useless to white robbers, the Indians cut holes in the canoes later."

**CLATSKANIE**

**Synonym:** A latskne-i, Athlaxsni (Kalaupua name), Clacks-star, Clack-star, Clackster, Clackstar, Claskanlo, Class-can-eye-eh, Clatcamin, Clat-sa-canin, Clatsaconin, Clatsani, Claxtar, Clax-ter, Clockstar, Klatscanai, Klatskanie, Klat ska-nurse, Klatsonis, Tlaskanl, Tlaskanl, Tlatscanai, Tlatskanai, Tlatskanie

(Hodge 1910:763).

**Cultural Identity and Distribution**

The Clatskanie are among the least known of the Indian groups in Oregon. Only brief references to these people, found in the journals of early visitors to the area, aid our understanding of this now extinct group. Unfortunately, most early historic accounts did not distinguish the Clatskanie from the neighboring Chinook groups, even though they spoke languages belonging to two different linguistic phyla.

The ethnographic picture is further confused by the different locations given for the Clatskanie. The following statements illustrate the problem:

Lewis and Clark (Copes 1893:933): "On that creek [Scappoose Creek] reside the Clackstar nation, a numerous people of 1200 souls, who subsist on fish and wapato, and who trade by means of the Killamuck (Tillamook) River with the nation of that name on the Seacoast."


Lee and Frost (1968:99): "A clan called the Clatskanios lived upon the streams which empty into the head of Young's Bay, which clan is very nearly extinct."
Gibbs (1863:iv): "Klatskanie, 'on the upper waters of the Nehalem, a stream running into the Pacific, on those of Young's River, and one bearing their own name, which enters the Columbia at Oak Point.'"

Barry (1927:52): "The Tlats-ka-nai, or Class-can-eye-ah, around Clatskanie River."

That the aboriginal Clatskanie territory is poorly defined is reflected in the different boundaries drawn for the Clatskanie on various Indian distribution maps: compare Mooney (in Taylor 1974a:20), Berreman (1937:57), Ray (1938:37), Benson (in Farmer et al. 1973:14), Taylor (1974a:20), and Beckham (in Loy et al. 1976:7). Berreman (1937:24, 25, 57) indicates that the Clatskanie were a wholly inland group, occupying the mountainous headwaters of numerous streams in the Coast Range. Ray (1938:36), on the other hand, argues that the Clatskanie held land along the south bank of the Columbia River, starting at a point about 50 miles upstream from its mouth. Ray (1938:41) includes one Athapaskan village south of the Columbia with his list of Lower Chinook sites, which he gives as "Ila'task'ana (Klatskanie)." This name referred both to the village and the river at whose mouth it was located. This was the principal point where the Athapaskan-speaking Clatskanie touched the Columbia River. The settlement was large and thriving, being noted for salmon fishing, but more particularly for the deer, elk, bear, and beaver hunting nearby. The village was "most populous in the winter." This is the only village specifically known for the Clatskanie in the ethnographic literature.

Other fragments of support for riverine occupation/utilization are found scattered in early accounts. Lewis and Clark (Thwaites 1905:4:218) report meeting a party of "Claxtars and Cathalamumpas" in two canoes at the head of "quothlaahptile island" as they ascended the Columbia River in the spring of 1806. Anson Dart, who negotiated treaties with the Lower Columbia valley Indians for the cession of their lands in 1851, noted that the "Klatskanie band of Chinook" had in former times forced tribute from the Indians and whites who passed up or down the Columbia River, "it being impossible for the Hudson's Bay Company to pass with less than sixty armed men" (Coutes 1921:60-61). In 1792, Lt. Broughton named Point Warrior in the area later attributed to the Clatskanie after he was surrounded "by 23 canoes, carrying from three to twelve persons each, attired in their war garments, and in every other respect prepared for combat" (Vancouver 1798:2:61).

George Gibbs, during his visit to the area in 1854, was told that, according to tradition, the Clatskanie had formerly lived on the prairies bordering the Chehalis River in Washington, at the mouth of the Skokomish River, but on the failure of game populations, they left the country and crossed to the south side of the Columbia (1877:17). Powell (1891:63) discredits this story, as does Mrs. Lucier, a Chinook informant to Ray, who declared that the Clatskanie were not recent encroachers in the area (Ray 1938:36). However, evidence indicates that the Clatskanie were at least linguistically related to the Athapaskan-speaking Kwaltshokw people who lived north of the Columbia River as neighbors to the Cathlamet Chinook. It is interesting to note that Athapaskan languages were also spoken by Indian groups such as the Chetco and the Upper Umpqua in southwestern Oregon.

**Ethnographic Lifeways**

Very little specific information is known about the ethnographic patterns of the aboriginal Clatskanie. The general cultural homogeneity witnessed among the other better known Indian groups in northwestern Oregon, despite linguistic diversity, suggests that Clatskanie lifeways may have been similar to those of their Chinookan, Salishan, and Kalapuyan neighbors. But, the extent of that similarity is not known at this time. The failure of early visitors to distinguish the Clatskanie from the Chinook groups does suggest the possibility of numerous shared cultural patterns and traits stemming from exploitation of similar environmental areas. Lewis and Clark report a fish and wahkosh subsistence base for the Clatskanie (Coutes 1893:3:933); the Henry-Thompson journals (Coutes 1965:2:794) suggest that the Clatskanie may have placed greater importance on hunting than did their fisher-folk neighbors; Ray (1938:119) reports that the Lower Chinook groups imported large quantities of wahkosh through trade with the Clatskanie, as not much of this prized root was available within their home range. Ross (1923:95) further adds that the "Clatscanias" and the other nine Indian "tribes" he lists along the Lower Columbia River were a "commercial rather than a war-like people. Traffic in slaves and furs is their occupation." However, Taylor (1974:144) briefly states that "the Clatskanie . . . most emphatically were never part of the Chinook, linguistically or culturally," but no additional information is provided.

It is impossible to fully reconstruct the aboriginal lifeways of the Clatskanie from the few sketchy and often contradictory statements that are available. But the data
suggests that the Clatskanie were a small aboriginal group who ranged widely across the forested mountain region south of the Columbia in early historic times, exploiting available resources and interacting to some extent with the different linguistic groups with whom they interfaced. Taylor estimated a population of 400 Clatskanie for 1870; Simpson recorded 176 "Clatskaneyes" in Hudson's Bay records prior to the malarial epidemic of the 1830s (Taylor and Hoaglin 1932:102-183); the Clatskanie appear as a band of Chinook in the Tansy Point treaty negotiations of 1851; the treaty was not ratified by the Senate, and the Clatskanie, along with the Lower Chinook Indians, were never enrolled on northwestern reservations (McKenzie 1978:2-3). Gibbs (1877:171) found only eight surviving Clatskanie in 1884, and Mooney (1928:17) lists the Clatskanie as "extinct" by 1907.

Given the paucity of ethnographic and ethnohistoric data, and the early extinction of these people, archaeology is now the only avenue of research that may eventually provide more information on this cultural entity. This potential has not yet been exploited.

DISEASE

A discussion of cultural lifeways of the Indians once living in northwestern Oregon would be incomplete without mention of the major epidemics which swept through the area in early historic times with disastrous results for the native populations.

The first historically reported epidemic was smallpox, which spread westward from the Upper Missouri, reaching the Pacific Northwest circa 1782-1783. In the spring of 1806, Clark (Thwaites 1905:4241) reported an encounter with an Indian woman near the mouth of the Willamette River, "who was badly marked with smallpox," and who said she had nearly died of that disease when a girl. From this, Clark concluded that "this disorder...must have been twenty-eight or thirty years past, and about the time the Clatskans informed us that this disorder raged in their towns and destroyed their nation." Stearn and Stearn (1945) provide an extensive historical survey of the effects and dispersion of smallpox on the American continent since it arrived with Cortez in 1520.

By the early years of the nineteenth century, the local population had apparently stabilized. Gibbs (1877:182-183) even suggests that between 1820 to 1830, the Indian population was larger than it had ever been. Then, between 1830 to 1833, and periodically for several summers following, a second major epidemic, and the most devastating, the "intermittent fever" or "fever and ague" swept through northwestern Oregon. The epidemic is now generally thought to have been malaria, spread by the indigenous _Anopheles mosquitof American continent, since it arrived with Cortez in 1520.

The plague had devastating effects among the local Indian groups. Parker (Scott 1928:152) estimated that nine-tenths of the Indians below Celilo died. Minto (1900:312) noted that "where Lewis and Clark had, only forty years before, encountered, by information from the natives, thirteen thousand eight hundred and thirty below the Cascades and between that and the ocean[,] I do not believe that thirteen thousand could be found within the same limits at the latter date [1845]."

The remnant population recombined in new coalescences migrating up and down the valley trying to escape the disease (Suphan 1974:177). Measles, cholera, tuberculosis, and venereal disease further weakened the surviving native peoples, and drastically altered forever the aboriginal cultural lifeways.

RESERVATION STATUS

Until the 1840s, when increasing numbers of American settlers were arriving in western Oregon, the relations between visitors and the native occupants had been reasonably peaceful. However, after the Oregon Treaty of 1846, which gave the United States sovereignty over the area, conflicts increased as newcomers settled in the Willamette Valley and began destroying the Indians' native food resources. Passage of the Oregon Donation Land Act in
1850 opened up large tracts of land in western Oregon that had not been properly ceded from the native peoples.

The years 1851 to 1856 essentially brought to an end the Indian cultures and societies as free functioning entities in northwestern Oregon. During these years most western Oregon Indians entered into treaty negotiations with the United States government and were removed to reservations. Following the appointment of Anson Dart as the first Indian agent, at least thirteen treaties were negotiated in 1851. Small reservation allotments were created for each group generally within their larger territory and near desired food resource areas. However, none of these treaties, including those generally known as the Champoeg or Tansy Point treaties, were ratified by the Senate as they failed to remove the western Indians to the east side of the Cascades, which was the current Indian policy (McKenzie 1978).

Unable to gain ratification for his treaties, Dart resigned his commission and was succeeded by Joel Palmer, who was subsequently able to gain support for relocation of western Oregon Indians west of the Coast Range. The Coast Reservation (later renamed the Siletz Reservation) was established by Executive Order in 1855 on lands extending from the Salmon River, south to the Alsea River, and from the summit of the Coast Range to the Pacific Ocean. This area had formerly been the homeland of the southern Tillamook (Salmon River and Siletz divisions) and the Alsea. However, the greater number of inhabitants on the reservation were southwestern Oregon Athapaskans (i.e., Chetco, Tututni, Coquille) who were brought there as prisoners of war following the "Indian Wars" between 1850 and 1856 for the Oregon Territory. Large areas were subsequently taken from the Siletz Reservation, and by the late nineteenth century, less than four percent of the original reservation, given the Indians in compensation for their lands, remained (Bojorcas et al. 1976: 26-27).

The Grand Ronde Reservation was created in 1857 as a temporary reserve for the Willamette Valley and north coast Indians until they could be placed on the Siletz Reservation. These included various groups of Kalapuya, Molala, Clatskanie, Chinook, Tillamook, and Alsea. The reservation was located east of the Coast Range and about mid-way between Portland and Lincoln City (Confederated Tribes of Grand Ronde 1979:9; Bojorcas et al. 1976:27).

For a general review of the events leading to the reservation period, see Beckhme (1977) and Kuerch (1979). The development of Indian policy has been well documented by Royle (1900), Goen (1921, 1922), Peterson (1933), Harger (1972), and Robbins (1974). The history of western reservations has been addressed by Kent (1973), Harger (1972), and Kasner (1976). In addition, the reports and correspondence of the Superintendent of Indian Affairs are held in the National Archives; Mackey (1974) includes the proceedings of the Willamette Valley negotiations. Unfortunately, little information is recorded about these days of treaty negotiations, removal from lands, and reservation life from the Indian's perspective (c.f. Davenport 1907; Kasner 1976).

Acculturation progressed rapidly on the reservations, and with it the cultural lifeways that were first observed by Euro-Americans around the turn of the eighteenth century, were changed forever.

SUMMARY

In early historic times, northwestern Oregon was utilized by six major linguistically distinct Indian groups which are now generally recognized as the Kalapuya, Molala, Alsea, Tillamook, Chinook, and Clatskanie. Despite the remarkable linguistic diversity among these peoples, all shared a relatively homogeneous cultural base. In general, these Northwest Coast societies were characterized by an economy based on the exploitation of varied marine resources, particularly salmon; a weakly defined political system in which the autonomous village was the primary political unit; individual status defined to a considerable extent by the acquisition of wealth; the elaboration of woodworking; social interaction facilitated by water transport; and participation in a highly developed regional system of trade. Island Kalapuya, and to a lesser degree the upland Molala, proved to be the most aberrant to this overall cultural pattern, as their subsistence base and related technology focused on land-based resource exploitation, instead of the primary regional dependence on marine resources. However, the basic pattern of subsistence activities throughout the area entailed utilization of diversified plant and animal products following a biseasonal cycle. During the winter months, social and economic activities centered about relatively stable permanent villages which were characterized by the presence of large, multiple family dwellings generally located along the banks of major river courses. From early spring until late fall, villages tended to be dispersed into smaller task-oriented units, establishing temporary campsites near resource areas or at
special sites of social importance. Extensive communication and trading among many of these native peoples were evident by the prevalence of intergroup marriages, head deformation of free-born infants, shared material and food products, and widespread use of a trade language, at least during the more recent ethnographic period.

The aboriginal lifeways of these peoples were first observed and reported by Euro-American seamen in the late eighteenth century. However, in less than a century of interaction, these native cultural patterns which may have extended millennia into the past were severely altered due to the combined factors of introduced diseases, disruption of their economic system in response to desires for foreign goods, and encroachment of American settlers into Indian resource areas. By the late 1850s the majority of surviving northwestern Oregon Indians had been removed to the Coast (Siletz) and Grand Ronde reservations in western Oregon, essentially bringing to an end the highly developed cultural systems which had evolved in response to unique environmental conditions over a period of thousands of years.
HISTORICAL OVERVIEW

The course of human history in the Salem BLM District follows many of the patterns familiar in the development of the American West in the nineteenth and twentieth centuries. The cast of characters—explorers, fur seekers, cattle drovers, missionaries, miners, settlers, and town developers—all appeared and in larger and lesser degrees played active roles in the evolution of that frontier. Beyond these figures, several themes also emerge as part of the human history of the region. These topics include the role of the federal government in shaping that region and the emergence of transportation systems. In the larger sphere of economic development the appearance of commercial logging and lumbering, of the export of agricultural commodities, and of local manufacturing facilities such as grist mills and woolen mills also are important parts of the region’s history.

The following narrative overview seeks to lift up those developments which mirror the major trends of human activity in the Salem BLM District in the historic period. Special emphasis is given to those human enterprises which have specifically had impacts on the BLM lands. Nevertheless, some mention is also given of trends in the central part of the Willamette Valley itself, for often the expenditure of capital and the dreams of mid-valley residents had eventual impact on the regions to the east and west in the foothills of the surrounding mountains. Thus the plans of road builders in a valley town might result in eventual human activity on distant federal properties. Similarly the emergence of urban centers in the valley might set the stage for recreational use of the public domain in the wilder sections of the region, including those lands today administered by the Salem BLM District.

This overview is documented with references both to primary and secondary sources on the topics explored within it. Those who seek more information on the subjects covered in this study can explore further in the literature about the history of western Oregon and the American West.

EXPLORATION

The exploration of the Salem BLM District by non-Indians commenced in the late-eighteenth century when travelers from distant lands began spring out the resources of the northwest coast of North America. The first chapter in that era opened with the stirrings of the Enlightenment, that time in the Western World when nation-states pitted themselves against each other in competition in the arts, sciences, philosophy, and empire-building.

In the 1770s several western European countries outfitted expeditions for the exploration of distant lands around the world. Chief among those nations engaged in this activity was Spain. From the voyages of Columbus in the 1490s through the conquests of Cortez in Mexico in the 1520s, that nation was setting the stage for a long-term and far-flung commitment in the Americas. Spain eventually developed a vast empire in the New World and by the mid-eighteenth century controlled lands from the American Southwest to the southern Andes of South America. The period of the 1750s and the 1760s, however, was disturbing for the Spanish. The leaders of New Spain (Mexico) had learned of Russian-backed voyages to the North Pacific and of Russian settlements somewhere to the north along the coast (Caughhey 1953:100-111).

The Spanish response was to send out a series of expeditions by sea under Juan Perez, Bodega y Quadra, Bruno Heceta, and Jose Martinez in the mid-1770s and in later years to send vessels and personnel to Nootka Sound and to Naxa Bay. Although Heceta sighted the mouth of the Columbia River in 1775, the Spanish did not enter that estuary or explore this great river of the West (Cook 1972).

In May, 1792, Robert Gray, a trader from Boston seeking furs, located the mouth of the Columbia and entered the river. His “discovery” of the lands of the Chinookan-speakers helped establish the American claim to the region through the then popular concept of the “right of discovery” as helping to convey title. Although Gray and his party only explored the lower estuary, he reported his findings to Captain George Vancouver, the British explorer whom he met later that year in coastal British Columbia. In October Vancouver sailed to the Columbia and brought two vessels, the Chatham and the Discovery, over the bar for the exploration and mapping of the navigable parts of the river (Barry 1932:31-42, 143-44).

The principal explorations of the river were assigned to Lt. William Broughton, Vancouver’s assistant. Broughton sailed along the river 100 miles of the river and went as far afield as the entry to the Columbia Gorge and the vicinity of the Sandy River. During the course of his voyage he mapped the shoreline, took depth readings in the river, and became the first non-Indian to view the forested hillsides that many years later would be
The Willamette Valley and the eastern part of the Lower Columbia River estuary remained isolated from the major explorations of the late eighteenth century and from much of the concurrent maritime fur trade which drew dozens of trading vessels to the coast in the late 1780s and the 1790s. Although Malaspina from Spain, Laperouse of France, and Cook of Great Britain all sailed to the North Pacific in the late eighteenth century, none of them entered the Columbia River. Those traders who put in at the river's mouth spent a week or ten days bartering for furs with the Chinook and Clatsop Indians and sailed away without further exploration of the river (Ruby and Brown 1976).

The explorations of the Enlightenment Era gave form to the cartography of the northwest coast of North America. The official expeditions of various nations as well as the economic ventures of the maritime fur seekers led to a series of maps showing the coastline from New Spain to the Bering Straits. Mariners located the capes and headlands along the shore, entered several of the rivers and estuaries, explored Puget Sound and the inland waters of British Columbia and Alaska, and noted the appearance of the land and waters on their charts (Wagner 1937).

Similarly, the accounts of these early explorers and traders began the recording of data on the Indians of the region. The official, government-backed parties such as that of George Vancouver collected artifacts representative of the technology and artistry of the Indians. Some of the fur seekers noted personality traits of the village leaders, the dress and tastes of these people, and the varieties of their foods. Broughton's chart of the Columbia was sufficiently detailed to show the numbers of plank slab houses in each of the major villages which he passed on his voyage up the estuary (Gunther 1972; Broughton 1792).

Land-based exploration of the Pacific Northwest did not commence until the overland expedition through what is now western Canada by Alexander MacKenzie in 1793. This fur-seeker not only crossed the continent by land to the Pacific Ocean in British Columbia, he published an account of his adventures, the Voyage from Montreal Through the Continent of North America to the Frozen and Pacific Ocean in 1790 and 1791 (1801). Among the proposals emerging from his explorations was that a continental or land-based fur trade was entirely possible in the region beyond the Rocky Mountains (Sheppe 1962).

President Thomas Jefferson, an Enlightenment Era philosopher, statesman, and writer, had as early as the 1790s conceived a grand plan for the exploration of the interior of North America and the distant North Pacific Coast. Twice in that decade Jefferson attempted to send out explorers to secure information about that unknown region. As president of the United States, Jefferson was able to realize his goals, for in 1803 he secured the purchase of Louisiana Territory from France. That purchase enabled him to gain a Congressional appropriation to outfit an expedition under Meriwether Lewis and William Clark to traverse the continent and record data on the Indians, rivers, trade routes, minerals, weather, botany, and other natural resources of both the newly purchased territory and the region farther west to the Pacific Ocean (DeVoto 1952:422-32).

Lewis and Clark brought their band of explorers across the vast continent in 1804-06. They were the first party by land to traverse the region from the Mississippi Valley to the Pacific Ocean. In November, 1805, the party emerged from the Columbia Gorge and passed down the Columbia River by dugout canoe or pirogue. Within sight of lands in the Clackamas District of the Salem BLM, William Clark wrote on November 2:

here the mountains leave the river on each Side, which from the great Shute to this place is high and rugid; thickly covered with timber principally of the Pine Species. The bottoms below appear extensive and thickly covered with wood. river here about 2-1/2 miles wide. Seven Indians in a canoe on their way down to trade with the natives below, encamp with us...

With this diary entry and the brief notations on Broughton's chart, compiled thirteen years before, the recorded history of the region commenced (DeVoto 1953:273-74).

The Lewis and Clark expedition passed quickly on down the river to the coast where the men passed the rain-soaked months of November, 1805-March, 1806 encamped at Fort Clatsop. On April 2, 1806, as these Americans wearily paddled their way up the Columbia on their return journey, they found the mouth of the Willamette River, referred to by them as the Multnomah. Clark wrote:

Multnomah discharges itself in the Columbia on the S.E. and may be justly said to be in the size of that noble river. Multnomah had fallen 18 inches from its greatest annual height. three small islands are situated in it's
Figure 7. Many homesteaders moved into the Nestucca watershed of southern Tillamook County in the 1870's and the 1880's. Their "improvements" included small claim cabins. (Oregon Historical Society Photo)
mouth which hides the river from view from the Columbia. From the entrance of this river, I can plainly see Mt. Jefferson which is high and covered with snow S.E. Mt. Hood, East, Mt. St. Helens [and] a high humped mountain [Mount Adams] to the East of Mt. St. Helens.

The explorers did not investigate very far up the Willamette. Clark, however, was impressed with the size of the stream and noted that he was "perfectly satisfied of the size and magnitude of this great river which must water that vast tract of Country between the western range of mountains and those on the sea coast and as far S. as the Waters of California about Lat. 37. North" (Devoto 1953:341).

When Lewis and Clark returned to St. Louis in 1806, news spread quickly of the staggering resources of the lands through which they had traveled. Especially alluring to American investors was the fur potential of the American West. Furs were a major commodity in the export market of the young United States at the turn of the nineteenth century. The Oregon Country beckoned alluringly to those who would invest in outfitting expeditions to exploit the furs of the mountains and valleys of the region as the maritime trade had enriched those who had risked their capital to send sailing ships to the North Pacific in the eighteenth century.

John Jacob Astor, a New York-based entrepreneur in the fur trade, responded quickly. Astor envisioned a permanent post at the mouth of the Columbia River to be staffed by personnel by land and by sea. He planned to secure furs from a land-based trade as well as by the usual maritime bartering with the Indians and ship those furs directly to the Orient. His Pacific Fur Company was to establish its base at the gateway to the interior of the Northwest on the coast near Lewis and Clark's winter encampment (Porter 1931).

Astor's investments led not only to the establish of Fort Astoria in 1811 but also to subsequent explorations of the Willamette Valley. The Pacific Fur Company sent parties by sea on the coast and by land under Wilson Price Hunt to staff the headquarters post at the mouth of the Columbia River. The rigors of sailing around Cape Horn and the treachery of the bar of the Columbia sorely taxed the maritime members of this enterprise. Crossing the continent in the winter of 1810-11 was a rigorous undertaking for Hunt's party. Both groups, however, eventually arrived on the Oregon coast to fell the trees and build the trading post which Astor had envisioned (Johansen 1967:94-97).

The arrival of these Americans at last led to the white exploration of the Willamette Valley. Gabriel Franchere, a member of the Astor party, described how in May, 1811, he paddled with some of the explorers who had come by sea up the Columbia to the mouth of the Willamette:

Our guide informed us that up this river about a day's journey there was a large waterfall and beyond it the country abounded in beaver, otter, deer, and other wild animals. Here, where we were, the rows of oaks and poplars lining both banks of the river, the green and flower-covered prairies glimpsed through the trees, and the mountains seen in the distance presented a smiling and enchanting prospect to the observer who loved the beauties of simple nature (Franchere 1867:80).

On December 5, 1811, Robert Stuart departed from Fort Astoria with a small party to explore the Willamette River and locate a site for a depot or small trading post. This group, which included Benjamin Fillet, Donald McGillivry, and Regis Bruguier, the hunter, was probably the first white party to ascend to the Willamette Falls and to enter the Willamette Valley. The extent of this group's explorations were not reported (Franchere 1967:63). In April, 1812, another exploring party, this time under Donald McKenzie, set out from Fort Astoria to enter the Willamette Valley. Although the expedition had returned to the coast by May 11, historians have concluded that this group of Americans probably reached the southern end of the Willamette Valley and the stream known as the McKenzie River (Hussey 1957:26).

On November 23, 1812, two clerks of the Pacific Fur Company, William Wallace and J. C. Halsey, set out with fourteen men for the Willamette Valley to establish a trading post. The conditions which led to this first white settlement in the valley were probably the result of the ravages of scurvy and the lack of provisions at Fort Astoria. McKenzie's explorations of the previous spring had resulted in the discovery of abundant game in the valley, especially herds of elk and deer. The results of this expedition were chronicled by Gabriel Franchere who wrote:

On March 20, 1813, Messrs. Reed and Seton, who had led part of our men to the post on the Willamette, to feed them, returned to Astoria. These gentlemen described the country of the Willamette as charming and abounding in
beaver and deer, and they told us that Messrs. Wallace and Halsey had built a trading house on a great prairie about 150 miles from the mouth of that river (Franchere 1867:75).

The historian John Hussey has concluded that Wallace House, as this first settlement was then known, was probably in the vicinity of present Salem, Oregon. A map of the valley drawn in 1833 refers to "Old Walls House and Island" (Hussey 1867:26). During the winter of 1812-13, Wallace and Halsey not only found food for their men in the valley, they explored its resources and by May 25, 1813, returned to Astoria with seventeen packs of furs and thirty-two bales of dried venison. Thus, by this date, the Willamette Valley had yielded resources for exportation. The venison went down the Columbia to feed the hungry Astorians. The furs were destined for a world market (Hussey 1867:26).

While Astor's men were exploring the Willamette Valley, the employees of the Canadian-based North West Company continued pushing westward. On January 15, 1813, Donald McKenzie of the North West Company arrived at the mouth of the Columbia with the disturbing news that the United States and Great Britain were at war. If British naval frigates did not cut off Astor's supply vessels, the likelihood existed that the British forces might well enter the Columbia River and seize Fort Astoria as a prize of war. The North West Company was very interested in such a prospect. In the summer of 1811 David Thompson, one of the principals in that firm, had descended the Columbia River to the coast. With the prospect of the loss of everything, Astor's Oregon partners weighed their situation carefully. Their conclusion was to sell out to the North West Company (Johansen 1967:97-105).

As the Astorians ended their explorations and development of the resources of the Willamette Valley, the North West Company moved in. For the next several years, until the merger of that firm with the Hudson's Bay Company in 1821, these Canadian-based fur seekers sought the furs of the valley and its tributaries. Some of the men, such as William and Alexander Henry, not only explored and traded but also kept diaries. In 1814, William Henry wrote about the Indians of the Willamette Valley and noted that they:

are called Callapuyowes, and appear to be a wretched tribe, diminutive in size with scarcely any covering, like those met this morning at the portage [at the Willamette Falls]. This nation is numerous, extending up to the headwaters of the Willamette, and dividing into several distinct tribes. They are a wandering race, who have neither horses, tents, nor homes, but live in the open air in fine weather, and under the shelter of large spreading pines and cedars during foul weather. Their country is well adapted to such a roving life as they lead, and their wants are few; deer are numerous, but roots of various kinds, which abound, constitute their principal food (Coses 1897).

From 1814 until the mid-1820s only sketchy information is known about the explorations and activities of whites in the Willamette Valley. John Hussey, in his rigorous historical study of French Prairie for the National Park Service and the Oregon Department of Transportation, has used such phrases as "although specific information is lacking" and "little is known at present" to describe these years. Probably the North West Company men, free traders, and Hudson's Bay Company employees regularly passed through the region. Some may have explored the Yamhill, Santiam, or other drainages; none, however, recorded his activities or gave detailed reports to his superiors which have survived (Hussey 1967:32-33).

In 1826, however, the picture altered. That year Alexander Roderick McLeod of the Hudson's Bay Company was ordered to proceed south from Fort Vancouver to search out the fur potentials of the estuaries of coastal Oregon. Departing in May, McLeod led a party which included three Oregon Indians, three Hawaiians, seven whites, and several Indian women (probably of various racial backgrounds). This party's route went up the Willamette to Chehalem Creek, west through the Chehalem Valley, southwestwardly into the Yamhill Valley to Panther Creek, and over the Coast Range into the watershed of the Nestucca River. The explorers then moved south along the coast to the Siuslaw River, turned back, came again to the Nestucca and over the Coast Range, and moved northeasterly across the Tuatulit Plains to Fort Vancouver (Davies and Johnson 1961:143-48).

During this journey McLeod kept a diary which he entitled "Journal of a Trapping Expedition along the Coast South of the Columbia River." Although not published until the latter part of the twentieth century and thus of little impact on the subsequent awareness of that region to the American public, this diary was placed in the Hudson's Bay Company archives and informed the Chief Factor, John McLoughlin, of the nature of the land and the Indian inhabitants of the area. In the watershed of the North Yamhill River, for example, McLeod noted that the Yamhill Indians had a number of horses and were eager to trade them. His party found deer hunting excellent; several hours were spent processing the hides and drying the meat for the expedition (Davies and Johnson 1961:151).
That fall McLeod was dispatched on a second expedition to coastal Oregon. McLoughlin, somewhat exasperated that this leader had not shoved farther south on the coast, ordered McLeod to pass through the Willamette Valley and descend the Umpqua River to the sea. McLeod did so, traveled as far south as the Rogue River, turned back and explored the Coquille Valley and much of the Umpqua Valley, and, at last, traversed again the full length of the Willamette Valley on his return to Fort Vancouver. Throughout the journey he recorded his "Journal of a hunting Expedition to the Southward of the Umpqua under the command of A. R. McLeod" (Davies and Johnson 1961:175).

McLeod's explorations of the Willamette Valley and southwestern Oregon took on a special character in that he was accompanied by the botanist David Douglas. A collector of herbarium specimens, seeds, and possible nursery stock for the Horticultural Society of London, Douglas, too, was a diarist during these explorations. Both of the writers commented on the extent to which the Willamette Valley had been subjected to field burning that year. Douglas moaned that he was unable to find specimens because of the extent of the fires; McLeod worried about adequate fodder for the horses belonging to the party (Davies and Johnson 1961:176-77; Lavender 1972:129-30).

These fur seekers were led through the Willamette Valley by Alexis Aubichon, A veteran of the trade, Aubichon had married Elmermich, a Chinook Indian from the mouth of the Columbia River. As a free trader following his Hudson's Bay Company tenure, Aubichon had come to know the valley and was, as McLeod noted, "the individual who has had most opportunities of attaining a knowledge of the Country" (Davies and Johnson 1961:178; Munick and Warner 1972:A-2).

During his passage through the Willamette Valley that September and October, Douglas collected specimens of Donia and a Phlox and entered into his diary miscellaneous notes about the terrain and the wild life of the region. He saw squirrels, hawks, and grizzly bears. Douglas collected many specimens in the watershed of the Umpqua but to his great distress, on his return to the Willamette Valley, most of them were drowned into the river and thoroughly soaked as he was crossing at the mouth of the Santiam. He wrote that evening: "Camped about three o'clock, being faint [glad] to give my collection and clothing time to dry, which employed me all of the evening" (Lavender 1972:159-60).

After his extensive explorations in southwestern Oregon and trapping the Coquille and Umpqua valleys, McLeod at last in March, 1827, returned to the Willamette Valley. Soaked by constant spring rains, his party moved down the valley and arrived on March 14 at Fort Vancouver (Davies and Johnson 1961:217-19). These explorations plus those of Peter Skene Ogden into the watersheds of the Klamath and Rogue rivers in 1826-27 had made the Hudson's Bay Company leaders aware of sufficient fur-bearing animals to set up annual or biennial brigades to work the region. Year after year these parties, sometimes journeying as far south as the Sacramento Valley (known to them as the Bona Ventura), passed back and forth through the valley of the Willamette (Davies and Johnson 1961; Meloney 1945).

By the 1830s several hundred non-Indian residents of Oregon had viewed much of the Willamette Valley. These men had served the various fur companies or had worked as free trappers. A few passes in the mountains had been explored by them, especially in the Coast Range. The Cascade Mountains, however, remained unknown and an awesome barrier to travelers. Those wanting to go to the Columbia Plateau moved east through the Gorge of the Columbia River.

The exploration of western Oregon reached a new level of activity and significance in 1841. In that year the U.S. South Seas Surveying and Exploring Expedition, outfitted by authorization and funding of Congress, brought its personnel to Fort Vancouver. Charles Wilkes, the commander, dispatched parties in many directions. One, under the direction of Lt. George Foster Emmons traversed the length of the Willamette Valley and moved on south to Sutter's Fort in the Sacramento Valley. Among those on Emmon's staff were the naturalist and artist Titian Ramsay Peale, the botanist William D. Brackenridge, the mineralogist James D. Dana, the botanist William Rich, and the artist Alfred T. Agate. Henry Atwood of the party, was an amateur artist who made sketches of scenes in the Willamette Valley and along the route to California (Pouch 1961:67-69, 189-98; Wilkes 1845, vol. 4).

The reports of these men and the personal observations made in the valley by Wilkes on his explorations led in 1845 to the detailed narrative "Willamette Valley" which appeared in the multi-volume final account of the five years of work by this government party in its voyages to the Pacific Ocean. Wilkes explored the valley as far as Mill Creek at present Salem, crossed to the west side into the Yamhill region, and passed through the Chehalem Valley before returning to Fort Vancouver. The commander was impressed by the great Indian fisheries and the water power potentials of the Willamette Falls, the indolence and lack of cleanliness of the settlers residing at French Prairie,
the ravages of panthers on the livestock, and the terrible conditions of the Indians who had survived the fowlers of 1830-33. "In speaking of the Willamette Valley," wrote Wilkes:

I have viewed its advantages for raising crops, pasturage of stock, and the facilities of settlers becoming rich. There is, however, one objection to its ever becoming a large settlement, in consequence of the interruption of the navigation of its rivers in the dry season; which renders it difficult to get to a market, as well as to receive supplies (Wilkes 1845:4:365).

Similar to Wilkes' "exploration" of the Willamette Valley was the tour made that same year by Eugen Duflot de Mofras, an "informal" envoy of the French government. This writer found a cordial reception among the French-speaking settlers in the valley and assessed the agricultural potentials of the region in glowing terms. "The soil produces at least eight hecctolitres per hectare," he wrote. Like Wilkes, however, de Mofras did little more than visit the settlements in the main part of the valley (de Mofras 1844:211).

Exploration of the Cascades became a significant factor in 1845. Two events led to these efforts. One was the political aspirations of Dr. Elijah White, a man who hoped to gain public standing and credibility as the discoverer of an emigrant route through the mountains. The second was the determination of emigrants—Samuel K. Barlow and Joel Palmer—who had arrived at The Dalles and decided that no matter what the obstacles, they would find a way west around the southern slopes of Mount Hood (Menefee and Tiller 1976:317).

Elijah White, sometime missionary and Indian agent, aspired not only to political preference but also to the reward of $2,000 subscribed by the residents of the Willamette Valley to the person who could locate a good wagon road through the Cascades. On July 12, 1845, White led a group of eight men along the Cascade foothills to find a pass. The party had no luck. After reaching the southern end of the valley, White then took the group along the western side or in the foothills of the Coast Range to look for a pass through to the Pacific Ocean. The men located a route through the mountains to Yaquina Bay (Bancroft 1886:1:484-85).

Of greater significance were the explorations of Barlow and Palmer. These overland emigrants sought a route that would avoid the dangers of descending the Columbia River and the rapids in the Gorge. In September, 1845, Barlow set out to the southwest from The Dalles with seven wagons. A few days later Joel Palmer made a similar decision and with fifteen families took up the same course. Weeks of trial faced these trail blazers. After plunging into the forested foothills of the Cascades and finding a tentative route, Barlow returned to the emigrants who slowly cut their way through the brush and trees. Days passed, but slowly the emigrants climbed toward the watershed of White River. As winter closed in they made their way up Barlow Creek toward the pass at the foot of the southern side of Mount Hood. Finally with snow threatening, the pioneers abandoned their wagons at Fort Depot, a site guarded by two volunteers who were to spend the winter in the Cascades. Barlow and Palmer and the others then moved west by pack team and arrived, at last, in the Willamette Valley. In 1846 Barlow opened a toll road and with workers cut a rude trail for wagons through the mountains and down the Zigzag and Sandy rivers to the meadows east of Oregon City (Beckham 1979; Palmer 1847:50-79).

In 1855 another government-financed expedition, the Pacific Railroad Surveys, brought U.S. Army forces to Oregon Territory for an examination of railroad routes. These parties examined the Cascade Range on both its eastern and western flanks for routes to the Willamette Valley. The army explorers, supported by a civilian scientific staff, found possible railroad grades south of Mount Pitt (McLoughlin), south of Diamond Peak, and at the "new pass south of Mount Hood," a route some twenty miles south of the mountain that eventually led down the ridge dividing the Sandy and Clackamas watersheds to Clackamas Prairie. The explorers also suggested that Foster Pass or the Barlow Road route might be used, and that two other alternatives were an Indian trail along the northern side of Mount Hood and the main route through the Columbia River Gorge (Williamson and Abbot 1857).

This government report contained a very positive assessment of the Willamette Valley which was examined closely by the explorers:

This valley, which forms the richest and most populous portion of Oregon, lies between the Cascade mountains and the Coast Range. It is about one hundred and fifty miles in length, and fifty in breadth. Its general elevation above the sea level is from two to eight hundred feet. Some parts of it are well timbered with oak, maple, cedar, fir, spruce, abor vitae, and other valuable kinds of trees; other portions are open and fertile prairies. The soil is generally very rich, and produces in abundance wheat, oats, barley, potatoes, and other products of the eastern States. Indian corn, however, cannot be cultivated to advantage. The Willamette river, flowing
through the valley, receives many tributaries from the east and west, which furnish an abundant supply of water. The navigation of this river is interrupted by rapids, near Oregon City, about twenty-five miles from its mouth. At the season of high water, however, it is navigable for small steamboats, from the upper end of these rapids to Corvallis, a distance of about one hundred miles by the course of the river. Numerous flourishing towns, and a few cities, are located upon its banks, and settlers' houses are now to be seen throughout nearly the whole of this beautiful valley, which has been appropriately called the Garden of Oregon (Williamson and Abbot 1857:33-34).

Although the "New Pass Near Mount Hood," the one leading from the watershed of Tygh Creek to the Willamette Valley was touted with some enthusiasm by these explorers, they were unable to investigate its route west of the Cascades. They explained:

From the summit of the pass to the Willamette Valley, the railroad would follow a route which we could not travel over, on account of an immense number of logs that completely blocked up the way. We passed along the ridges, however, from which we could overlook it, and see that the fallen timber was probably the only serious obstacle. The great ravine extending north and south could be crossed, and Clackamas Ravine entered by a lateral canyon and followed, apparently without any obstruction from bends or side spurs, to the valley.

These explorers noted that the route might be cleared of logs, underbrush, and timber. Nevertheless, they surmised that during the winter the pass would likely be buried in twenty to twenty-five feet of snow (Williamson and Abbot 1857:46-47).

Thus by the mid-1850s the Willamette Valley, the Coast Range, and the high passes of the Cascade Range had all received scrutiny by explorers. Probably much of the region had been investigated during the 1820s by free trappers and employees of the Hudson's Bay Company. Most of these men were illiterate and thus their solitary treks through what had been an Indian land for centuries remains unknown. By the 1840s, however, the determined efforts of explorers resulted in detailed diaries and narratives about the Willamette Valley and some of the Cascade area, especially the Barlow Pass region south of Mount Hood. The Pacific Railroad surveys of 1865 brought geologists, botanists, cartographers, artists, and army personnel into the Cascades. Their reports, published by the U.S. government in 1857, gave detailed information on the resources of western Oregon.

INDIAN-WHITE RELATIONS

When white explorers and fur-seekers first entered the valley of the Willamette in the early nineteenth century they found the scattered bands of Kalapuyans above the falls of the Willamette by these people, identified as speakers of the Takelma-Kalapuyan Language family, used three major dialects: Tualatin-Yamhill at the northern end of the valley, Santiam in the middle part of the valley, and Yoncalla at the southern end of the valley. Below the falls resided bands of speakers of the Upper Chinookan dialect: the Clackamas, Clackamas, and Multnomah (Thompson 1970:991, 994; Zenk n.d.).

Throughout the period of initial contact, the fur trade, and white settlement in the 1820s-1850s the relations between the Indians and whites west of the Cascades and north of the Umpqua Mountains remained relatively good. Compared to other parts of the Pacific Northwest in the nineteenth century, the interface was remarkably peaceful. This situation was the result of several factors. First, perhaps, were the disastrous epidemics which in the years 1830-33, especially, decimated the Indian population. Second was the ready assimilation of French-Canadian fur-seekers with the native population and the mutual dependence and trust which evolved in the two decades prior to extensive American emigrant settlement. Third was the lack of mineral resources to attract the reckless and unprincipled hordes who, on other frontiers in the American West, sparked hostilities with the Indians (Beckham 1977).

Among the earliest accounts of meeting of Indians and whites in the valley are those recorded in 1814 by William and Alexander Henry, fur-traders who ventured above the Willamette Falls. Meeting seven Yamhill Indians, Alexander Henry wrote that they appeared to him:

to be an ugly, ill-formed race, and four of them had some defect of the eyes . . . . Those we met were wretchedly clothed in deerskins; their quivers were of deer's heads and necks. Their women had petticoats of fringed leather, like the Chinook women's cedar petticoats, but reaching only halfway down the thighs. They wore small round bonnets of wattap
with a peak three inches high. They were of short stature, and altogether the most miserable, wild, and rascally looking tribe I have seen on this side of the Rocky Mountains (Coues 1897).

This negative assessment was echoed by William Henry who also noted that in 1814 these Indians had had virtually no contact with traders. "Indeed, they have no idea of the value of our goods," he wrote (Coues 1897).

The trade relationships between whites and the Kalapuysans opened as early as December, 1811, when an expedition of the Pacific Fur Company from Astoria set out for the Willamette Valley (Franchere 1967:63). The explorations of the Astorians led to the first white settlements among the Kalapuya when during the winter of 1812-13 William Wallace and J. C. Malsey and fourteen men established a post "on a great prairie" at a site which was reportedly 150 miles up the Willamette River. If the settlement was indeed that far into the Willamette drainage, it was in the vicinity of present Eugene, Oregon. John Hussey, the historian who has studied the French Prairie area more closely than anyone else, however, feels that the post was 150 miles up river from Astoria and thus was probably near the present site of Salem, Oregon (Hussey 1967:26).

The next intrusion of whites into the land of the Kalapuysans occurred in 1813 when the North West Company established Willamette Post two miles upstream from present Champoeg, Oregon. By January 1814, this establishment had one dwelling for the fur traders and two huts for the freemen and the Nipissing Indians who worked as hunters for the company. The records of this enterprise indicate that by this date as many as thirty men employed by the North West Company, two traders, and several freemen and Indians were residing at this site (Hussey 1967:27-30).

The relations between Indians and whites in this region were assessed by John Hussey when he wrote:

Little is known about the use of the Willamette Valley by the North Westers during the next few years. There had been a little trouble with the Indians early in 1814. Not only were the Kalapooian tribes restless, but the Cayuse, who occasionally visited the valley from far to the east to hunt, had warned the traders that their guns were frightening the game and that they would be driven from the region if they did not abandon it voluntarily. But William Henry reported that the bands living near the post had expressed regret at the departure of the Nor'Westers and begged them to return (Hussey 1967:30).

In 1816 when North West Company employees ascended the Willamette River to trap, the Indians demanded tribute from them for trespassing on their lands. The fur-trappers refused to pay and fought the Indians. One of the Indian band leaders was killed in the encounter; the whites fled to Fort George at Astoria and Alexander Ross, who recorded the incident, noted that "the project of hunting in the Willamette was relinquished for some time." Although payment was later offered for the death of the leader, another battle occurred and three Indians died in that conflict. Ultimately Ross led forty-five armed men into the valley and secured peace with the Indians at the Falls (Hussey 1967:30-31).

John Hussey has been critical of the North West Company in its relations with Indians in Oregon Territory. He has concluded:

The North Westers were unfortunate and inept in their relations with the Indians throughout the entire Columbia region, but evidently they managed to patch matters up once more in the Willamette area. It is reliably reported that one of their clerks, Thomas McKay, tall, dark, and brave as a lion, was sent with a party during 1820 to explore the country beyond the Willamette headwaters. 'Mr. Thomas McKay is doing well with his Band on the Willamette,' wrote one Nor'Wester to another on March 2, 1821 (Hussey 1967:31).

In 1821 the British parliament brought about the merger of the North West Company with the Hudson's Bay Company. The conflicts between the two firms had led to bloodshed in Canada. The British government would not allow this to continue. Thus, in the Pacific Northwest, the strong arm of trade which governed Indian-white relations passed from the Canadian-based North West Company to the 150-year-old Hudson's Bay Company. The new Chief Factor, Dr. John McLoughlin, was firm in his dealings with Indians. He counseled no hostilities; further, he was not willing to have his employees deal unfairly with the Indians. Humanity and justice shaped his policies and the interface with Indians throughout the Willamette region during the next twenty-five years (Galbraith 1957; Rich 1941, 1943, 1944).

Among the Hudson's Bay Company field leaders who worked in the watershed of the Willamette in the 1820s were Thomas McKay, a former clerk with the North West Company, and
Alexander Roderick McLeod. McKay by the mid-1820s established a trading post in the Umpqua Valley, a site later referred to as the "Old Establishment" (Rich 1943:114; Beckman 1971:30). In May, 1826, McLeod passed through the northern edge of the valley and traded with the Indians. Among the goods which he exchanged for salmon and horses were brass rings, gun powder, and lead balls (Davies and Johnson 1961:144-52). In this manner a variety of goods became increasingly available to the various bands occupying the Willamette Valley.

When Charles Wilkes and the American exploring party of 1841 visited the region, they found most of the Indians dressed in the clothing of whites (see Plate "Willamette Falls," Wilkes 1845:4:44). In spite of the general acculturation which occurred in the 1820s and 1830s, however, the dependence of these Indians upon traditional food resources was recounted in several narratives. Wilkes, for example, visited the great fishery at Willamette Falls and wrote:

I never saw so many fish collected together before; and the Indians are constantly employed in taking them. They rig out two stout poles, long enough to project over the foaming cauldron, and secure their larger ends to the rocks. On the outer end they make a platform for the fishermen to stand on, who is perched on it with a pole thirty feet long in hand, to which the net is fastened by a hoop four feet in diameter: the net is made to slide on the hoop, so as to close its mouth when the fish is taken. The mode of using the net is peculiar: they throw it into the foam as far up the stream as they can reach, and it being then quickly carried down, the fish who are running up in a contrary direction, are caught. Sometimes twenty large fish are taken by a single person in an hour; and it is only surprising that twice as many should not be caught (Wilkes 1845:4:345).

In 1829 the outbreak of a fever, perhaps the product of a virus or even of malaria, broke out among the Indians of the Columbia River estuary and the Willamette Valley. The results of this illness were devastating. The malady raged with a fury in the years 1830-33 and persisted for some time thereafter. Samuel Parker, an American missionary who visited the region in 1835, wrote:

Since the year 1829, probably seven-eighths, if not as Dr. McLaughlin believes, nine-tenths, have been swept away by disease, principally by fever and ague. The malignity of this disease may have been increased by predisposing causes, such as intemperance, and the influence of intercourse with sailors. But a more direct cause of the great mortality, was their mode of treatment.

Parker explained that one of the common Indian means of dealing with illness was sweating and plunging into a cold stream. Such a cure was unable to stop the ravages of this illness (Parker 1844:102-93). In the period of approximately three years perhaps as many as eighty percent of the Indians of the Willamette Valley and the Columbia estuary perished (Cook 1954:303-26; Taylor and Hoaglin 1962:160-76).

One of the major outcomes of this precipitous population decline was that the Indians of the region were unable to resist white incursions onto their lands. Wilkes found that by 1841 the fishery at the Willamette Falls was manned by about seventy Indians (Wilkes: 1845:4:346). In some villages but a sole survivor, a child, remained. None of these people were able to exact tribute for trespass on their lands. The various bands of the Tualatin, Yamhill, Santiam, or Ahantchuyuk in the northern end of the valley were unable to contest those who moved in among them. John Ball, a school teacher residing at Fort Vancouver in 1833, appropriately observed: "The natives of this part of the country are very peaceable, seldom making war on each other or the whites. They manifest a very different character from the Indians on the east of the mountains" (Mackey 1974:3-4).

Several of the Indian women from the bands in the Willamette Valley as well as Chinookan-speakers from the lower Willamette River and the Columbia estuary married the fur-seekers who penetrated the region in the 1820s. The accounts of the Hudson's Bay Company make brief reference to the presence of Indian women on the various brigades. The extent of the inter-marriage of Indians and whites is readily evident in the records of the Catholic Church which commenced with the establishment of the missions at St. Paul, Fort Vancouver, and Stellanarmis (at the mouth of the Columbia) in 1839 (Hunnicutt and Warner 1972, 1979).

Following the advent of the fur trade and the calamitous epidemics of the early 1830s, the most significant event in Indian-white relations was the establishment of missions among them by Protestants and Catholics. From 1800 to 1830 the United States went through a period of intense religious activity. Known as the "Second Great Awakening," this event brought not only thousands of conversions to Christianity but also the emergence of both home and foreign mission societies financially supported by the various denominations. As
early as 1819 American missionaries were sent to foreign fields such as Burma to preach to the "heathens." Thus, when reports circulated that American Indians might be receptive to Christian teaching in the Far West, many were ready to finance such endeavors (Harty 1970).

In 1821 American missionaries sent out by the American Board of Commissioners for Foreign Missions focused upon Oregon as a possible field for new labors. In 1829 an agent of the Board visited Oregon and recommended the establishment of outposts there. Then, in October, 1831, four Indians from the Oregon Country visited St. Louis reportedly in search of teachers to come to their people and preach Christianity. When reports of this visit were published in the Christian Advocate and Journal, a wave of enthusiasm swept through the United States for the mounting of missions to the Indians of distant Oregon. "Seldom has a letter pricked the public conscience as did this one," noted historian Ray A. Billington. "Overnight the plea of the poor benighted heathen who had journeyed 2,000 lonesome miles to request the word of God became the concern of every religious person in the United States" (Billington 1960:516-57).

Among those who responded was the Methodist minister Jason Lee. A recent convert to Christianity, Lee had envisioned the day when he might go west and preach to the Indians. In March, 1833, Lee received approval to leave his assignment in Canada to journey to Oregon. Accompanied by his nephew Daniel Lee and the layman Cyrus Shepard, Lee crossed the continent with the American fur-seeker Nathaniel Wyeth. Upon the recommendation of Dr. John McLoughlin these Methodists went to the Willamette Valley in September, 1834, and, at a site they were to call Mission Boton, they established their station on the southern end of French Prairie. Their intention was to convert the Indians of the Willamette Valley (Brosnan 1932).

Robert J. Lowenberg, the leading historian of the Methodist missions in Oregon, has assessed the arrival of the Lee contingent as a turning point in the history of the territory--both for the Hudson's Bay Company as well as for the New Americans:

Despite McLoughlin's imposing physical presence and his commanding personality he was far from being the undisputed ruler of the company's vast domain in the Oregon country. The Hudson's Bay Company that greeted the first American settlers was not so solid as it seemed. The company was standing pat in Oregon, not standing firm. The Methodist missionaries who came to Oregon in 1834 were emissaries of an institution that also seemed stronger than it actually was. In studying early Oregon, the historian is faced not simply with a clash of institutions but with a shadow play of dissolutions and changes taking place in British and American ideologies (Lowenberg 1976:35).

Lowenberg makes little mention of the ideologies of the Indians who were to be subjected to this newly introduced Methodist presence in the Willamette Valley. These people, who for centuries had sent their young on spirit quests to find guardians to guide them throughout their lives, had little remaining resiliency to resist the imposition of a new religion or new technologies. Declined by disease, their culture in a state of chaos with the death of those who had been the transmitters of oral traditions, and reduced to the rudiments of mere survival, those Indians who yet lived in the Willamette Valley were but a remnant of the once extensive native population. In this context Cyrus Shepard's note of January 10, 1835, penned at the new Methodist Mission, takes on meaning:

The special providence of God has, already, seemed to throw upon our care three poor Flathead orphans; one a lad of fourteen or fifteen years of age, who is quite serviceable in several ways. The other two are apparently about seven years of age; one is sister to the above mentioned lad, and they are the only survivors of the family to which they belonged; to this girl we have given the name of Iaicy Hedding. The other is a very flat-headed boy, and has neither parent, brother, nor sister. He came one day to the mission-house, and, in most imploring manner, asked in Indian, and by signs, to stay and live with us; and though food will naturally be rather scarce with us for the present, yet such importunities cannot be turned away. Providence, we trust, will provide means of support, till we can raise something to subsist on. These children came to us almost naked, in a very filthy state, and covered with vermin (Brosnan 1932:76).

That these Indian children had survived at all was remarkable. The impact of the fevers had been such that in some villages no one survived. To find these children nearly naked and covered with vermin was understandable in light of the experiences to which they had been subjected. Unfortunately, neither the missionaries nor the later white settlers quite grasped what was truly the situation. They assessed the Kalapuyans as a debased and degraded people, concluding that the survivors of the epidemics were representative of the state of culture of the native inhabitants of the Willamette Valley and its surrounding mountains.
These Methodists worked valiantly to convert the Indians who came to their settlement. Many obstacles, however, beset their labors. Virtually every task had to be accomplished before their teaching and converting could occur. The men had to erect buildings, till the meadows, fence the fields, harvest the crops, and stave off the ravages of panthers and wolves on their slender number of livestock. When someone died they had to construct the coffin, dig the grave, conduct the service, and carve a wooden marker. If they needed any staples they had to journey by dugout canoe down the Willamette to the Falls, portage to the lower river, paddle on to Fort Vancouver, and then return on a strenuous upriver journey to their station. Illustrative of the challenges was the letter of Jason Lee written on March 15, 1836:

We labour under many disadvantages. There is no Physician within 60 mi. Brother Shepard is unwell with an influenza, and I have been obliged to leave my letters, frequently, to day to look after household affairs, to make bread &c. and even now though it is 10 o'clock P.M. I have frequently to leave my letter to wait upon the sick (Brosnan 1932:79).

None of the first five Methodists to come to Oregon was a farmer. All were relatively well educated and dedicated to the ideal that conversion would be their first goal for the Indians; civilization of them would follow, they thought, naturally. An additional burden confronting those who had come among the Indians was their theology. “Methodist rhetoric tended to become almost eerily abstract,” wrote Robert Lowenberg, “the signal, ironically, that unsortied emotions, not the results of reasoned analysis, were being expressed. In this historian’s assessment, then, the Methodist vision of Christianity created a first-rate dilemma. ‘The reality was the Indian, a primitive who was incapable of becoming a Christian in Methodist terms,’ he has concluded (Lowenberg 1976:82-83). Perhaps this analysis thus explains the comments of Rev. Gustavus Hines, a later member of the Methodist contingent, who wrote in his diary that the “doom of extinction is suspended over this wretched race, and that the hand of providence is removing them to give place to a people more worthy . . .” (Hines 1881:117-18).

Even though the Methodists secured a reinforcement in 1839 of more than fifty support staff members and $100,000 to finance the projects in Oregon, success in conversions was elusive. The missionaries opened new stations on the Clatsop Plains, at Willamette Falls, and at The Dalles. Lee, Hines, and Elijah White trekked to the Umpqua Valley and went by canoe to the coast to check out the possibilities of yet another mission in southwestern Oregon. The returns in terms of Indian conversions were negligible. The problems of establishing the missions, of attempting to present Methodist theology replete with the joy that Rev. Henry Perkins found in the death of infant Indians (saved from excessive sin because of their short lives), and their growing interests in securing lands and investments—all undermined the labors of these Americans among the Indians in the Willamette region. Lee was fired in 1843; the missions were closed in 1844 (Lowenberg 1976:158; Johansen 1967:164).

In 1834 and again in 1835 the French-Canadian settlers who had settled on the meadows near Champoeg in the northern part of the Willamette Valley sent petitions to the priests in Canada to supply them with a Catholic missionary. In 1838 fathers Francois Norbert Blanchet and Modeste Demers joined a westward bound fur brigade to fill the requests from the residents of Oregon. As early as 1836 the residents of French Prairie had erected a log building for the priests. This structure was later moved and in early 1839 Father Blanchet established his station at St. Paul on the east bank of the Willamette. In 1843 a bequest enabled the fathers to open a boys’ school, St. Joseph’s College; in 1844 nuns came to the site and established a girls’ school, Ste. Marie de Wallawat (Munnick and Warner 1979:xvii-xix).

The Catholic missions, expanded to other stations at Stealmaris at the mouth of the Columbia, to the Cowlitz Valley, and to Fort Vancouver served both the Indians and the French-Canadians. The vows of poverty and chastity and the tight control of the church’s bishops as well as a good financial base created conditions wherein the Catholic missions succeeded where the Methodists had failed. Further, the priests had a good opportunity to work among the local Indians in the Willamette Valley because, speaking French, they could communicate readily with the former fur-seekers who knew the local Indian languages. Representative of the contacts which were established was Blanchet’s entry in the St. Paul parish a little less than two years after his arrival in the valley:

This 24 November, 1830 [1840] we priest undersigned have baptized at the house of Charles Rondeau Paul dit Captain, aged 20 years, sick with consumption, born of infidel parents of Kalapuyas nation. Godfather Charles Rondeau who has not known how to sign (Munnick and Warner 1979:16th, 17th, 18th pgs.).
While many of the Kalapuyans were baptized as Catholics, the number of living converts remained limited. Still ravaged by the diseases of the whites and the lingering presence of the fevers of the early 1830s, the Indians of the Willamette Valley yet died in large numbers. Many of the parish entries of baptisms at St. Paul are quickly followed by the note of a burial. The long range impact of the Catholic missions was in shaping the religious life, education, and attitudes of the half-Indian children of the five-seekers and their Indian wives who had settled in the region (Warner and Mannick 1979; O’Hara 1925).

The significant population dislocations in the watershed of the Willamette meant that when white settlers commenced arriving in large numbers in the 1840s, the Indians did not contest their trespass. Except for the conflict between a young Indian named Cockstock and some of his friends and residents of Linn City near Willamette Falls in 1844, hostilities did not occur (Lynch 1973:31-33). In 1848, however, whites in Marion County, enraged that some Klamath Indians who were spending the winter in the area had killed a calf, attacked these people. They fought on March 4 and 5. Twelve Indians were killed and one white was wounded. This episode became known as the Battle of the Ailqua (Brown 1926:11-12).

Although Dr. Elijah White acted as a sub-agent for Indian Affairs in Oregon in the mid-1840s, his tenure was without legal foundation. The American claim to the region was tenuous and had not yet been worked out with Great Britain or with the Indians in the territory. In 1846, however, the Oregon Treaty extended American sovereignty to the Pacific Northwest. In prior "occupancy" agreements in 1818 and 1827 the two nations had established that Oregon was a sphere of interest for each. Quite unilaterally, without any involvement of the Indians who actually held the lands in the Northwest, these two countries established in 1846 that Oregon as far north as the forty-ninth parallel was to become part of the United States. Two years later the American Congress extended territorial status to Oregon (Johansen 1967:112-20).

The ramifications of these events came quickly, for in 1849 the new territorial governor, Joseph Lane, assumed his duties including responsibility for Indian Affairs. His attitude toward his "charges" and the condition of the natives of the Willamette Valley was evident in his report of October 22:

The Calipou Indians are found on either side of the Willamette river. They are degraded, worthless and indolent people. They are poorly armed and entirely inoffensive. They live on roots, fish and berries. They number about 60.

The Tutlatow Indians occupy that portion of the country west of the Willamette river from its mouth to the mouth of the Yam Hill—a distance of sixty miles—thence west to the coast range of mountains. They number about sixty souls—thirty of whom are warriors. They are a degraded, mischievous and thievish set. They have but few arms.

The Yam Hill Indians are a small tribe who claim the country drained by a river of that name, which is mostly taken up by the whites; they are poor; have a few horses; are poorly armed, and are well disposed. They number about 90; of whom 19 are warriors.

The Jocko-mus Indians claim all the country drained by a stream of that name west of the Willamette and south of the Yam Hill river. They are part of the Calipou tribe, and number 15 in all; of whom 5 are warriors. They are friendly to the whites, very poor, and have greatly diminished in the last few years (Mackey 1974:84-85).

Lane's report was, of course, incomplete and inaccurate. The band groups in the Willamette Valley were many more than those whom he enumerated. He overlooked entirely the Molala who resided in the foothills of the Cascades. His population figures, as later reports by other agents and superintendents were to show, were too low. He had, however, filed the first government records on these people.

The Organic Act which created Oregon Territory in 1848 had among its many features extended to the Pacific Northwest the clauses of the Ordinance of 1787. That legislation, passed initially for the valley of the Ohio River, had established a philosophy of dealing with the American Indians for the new American government. That philosophy was, by the Organic Act, extended to the Indians of the Willamette Valley. In the "Ultimate Good Faith Clause" of the Ordinance and the Organic Act, Congress promised that the lands of the Indians would never be "invaded or disturbed, unless in just and lawful wars" (Beckham 1977:117).

In spite of these assurances, however, Congress enacted in 1850, prior to any Indian land cessions to the federal government in Oregon, a measure popularly known as the
Oregon Donation Land Act. This law provided, for free, up to one square mile to the married American citizens who settled in Oregon prior to that date and filed for the property. Amendments later extended the law for four years and permitted for further distribution of the public domain. The result was that "good faith" was scarcely kept with the Indians. Under the Donation Act, 7,427 pioneers filed on 5.5 million acres in western Oregon. These claims embraced almost the entire floor of the Willamette Valley as well as the bottomlands of the tributary streams such as the Yamhill, Santiam, Molalla, Pudding and Clackamas (Beckham 1977:117-18).

Relatedly Congress established a special Treaty Commission to secure the land cessions of the Indians of the Willamette Valley. On June 5, 1850, this federal legislative body set up Indian services for Oregon Territory and provided for the appointment of a Board of Commissioners to gain Indian land agreements. John Gaines, Alonzo A. Skinner, and Beverly Allen received the appointments to the board from Superintendent of Indian Affairs Anson Dart. Commencing in April, 1851, the Commissioners began their deliberations with the Indians of the Willamette Valley (Mackey 1974:85-90).

The goal of the treaty commission and of Oregon's political leaders in 1851 was to gain cession of all Indian lands in the valley. These agreements were to be coupled to the removal of the Indians to the Columbia Plateau. The land cessions were part of an "out-of-sight, out-of-mind" plan. The Indians of the Willamette Valley found themselves under the intense pressure of the commissioners not only to cede all of their lands but also to emigrate to a land they did not know, one which belonged to other Indians and a place whose resources they did not know. Naturally the Santiam, Tualatin, Yamhill, Luckiamute, and Molala resisted these proposals. The Indians held out for small reservations within their old territories and, ultimately, the commissioners agreed (Mackey 1974).

The treaty commissioners lived well as they bargained for token sums for the Indian lands of the fertile Willamette Valley. While they offered a few cents per acre for the region, they spent $19,700 during a five week period for food, lodging, and salaries for their conferences at Champoeg. In the long run all was a vain endeavor. Congress abrogated the treaty-making powers of the commission before its agreements were forwarded to Washington, D.C. The legacy of the negotiations, promises, signatures, and seemingly broken promises was disillusionment for the surviving Indians of the region. Not until January 4, 1855, did Joel Palmer negotiate a new, omnibus treaty of land cession which led to ratification by Congress. Acted upon on March 3, 1855, and proclaimed on April 10, this agreement ended the Indian land tenure in the valley and its surrounding hills and mountains (Beckham 1977).

Following the Palmer treaty the outbreak of Indian warfare in several parts of the Pacific Northwest in 1855-56 led to the removal of the Willamette Valley Indians to the Grand Ronde Indian Reservation. Established in the western part of the valley on the South Fork of the Yamhill River, this area of red soil and limited agricultural potential had been largely passed over by white settlers. Palmer, who resided in Dayton on the lower Yamhill River, felt the area was sufficiently isolated and free of white claimants to be satisfactory for the surviving Indians. On June 30, 1857, President James Buchanan created the Grand Ronde Reservation, a tract of 60,000 acres (Beckham 1977:147-48).

The Clackamas, Santiam, Tualatin, Luckiamute, Mary's River, Yamhill, and other Willamette Valley Indians were brought to the new reservation. So too refugee Indians and survivors of the Indian wars in the Umpqua Valley to the south came under armed guard to this reservation. To keep the Indians from fleeing and returning to their old homes the U.S. Army during the summer of 1856 established Fort Yamhill near the reservation. Staffed by soldiers who were bored by their assignment, this post did little to improve the condition of the Indians. The army also established Fort Hoskins in Kings Valley on the eastern edge of the Coast or Siletz Reservation (Bensell 1999).

The reservation experience for the surviving Willamette Valley Indians lasted for 100 years. Until termination in 1956, these people were subjected to the programs of the Bureau of Indian Affairs. For much of that period the goals of the government were to convert these Indians to a "civilized state." In the nineteenth century civilization was defined in terms of speaking English, tilling the soil, wearing American or European style clothing, having relatively short hair, and practicing Christianity. These were the major goals for the Bureau of Indian Affairs employees stationed at the western Oregon reservations (Beckham 1977).

To further the program of "civilization" the BIA established both day schools and boarding schools at Grand Ronde and Siletz. The latter model was a major objective because the agents and the teachers believed that students needed to be removed from the influences of their parents or grandparents. The efforts were to isolate young Indians, "civilize" them, and eventually permit them to take their place in the larger society. In
attainment of this goal the U.S. Army established a manual labor training school in 1881 at Forest Grove, Oregon. Moved in 1884 to Chemawa, a site near Salem, Oregon, this Indian boarding school continues in 1980 and has been a "home and training place for generations of Pacific Northwest Indians" (Beckham 1977).

Under the terms of the Dawes Severalty Act of 1887 the Indians at Grand Ronde eventually received allotments of land. By the early twentieth century all of the lands on the reservation had been allotted so that many of the younger Indians resided on the reservation but had no opportunity to gain land for themselves. In the 1930s these Indians took advantage of the 1935 Indian Reorganization Act and formed a tribal corporation, the Grand Ronde Indian Community, Inc. The outbreak of World War II, however, interfered with the government promises of reconstituting a land base, extending loans to tribal groups for economic development, or establishing sustained yield management of timber resources. In 1951 the Grand Ronde Indians dissolved their corporation. They were terminated in 1956 by Congress (Beckham 1977).

Unlike many other parts of Oregon and the Pacific Northwest, the lands of the Salem BLM District were largely free from the conflicts which characterized much of Indian-white relations in a frontier area. The revives of the fevers and epidemics of the early 1830s was the probable cause of such a situation, for even though the fur seekers had had relatively good relations with these Indians, occasional tensions and conflicts had arisen. On the whole the missionaries had little impact on the Indians of the area. By the late 1850s, however, the surviving Indians were colonized on the Grand Ronde Reservation. Subjected to a century of B.I.A. "civilization" programs, these people were legislated out of existence as Indians in 1956. Many of the descendants of the Willamette Valley bands survive today. Their knowledge of their Indian heritage is, however, very limited. No one speaks the old languages. No women yet weave the delicate baskets which once held the acorns or dried fish. Time has taken a heavy toll on the Indian presence in this part of western Oregon.

**Nineteenth Century Settlements**

From the first explorations of whites above the falls of the Willamette in the second decade of the nineteenth century to the steady arrival of overland emigrants in annual numbers by the 1860s, most sections of the Willamette Valley and its surrounding feeder watersheds were settled by white pioneers. The first generation of settlers were fur-seekers. Their goals were to trap and to trade for pelts to turn in to their employers whose posts were along the Columbia River. Soon, however, by the late 1820s a generation of old fur-seekers retired from pursuits and concluded to stay in Oregon. These men, often with Indian wives and half-Indian children, began to till the soil and establish an agricultural frontier.

In the 1830s missionaries came to the region. The American contingents, Methodists, wrote home glowing reports about the fertility of the soil, the wholesale deaths of the Indians, and the pleasant winters in Oregon. They helped publicize the territory and, when their missions did not prosper, they did. They fell upon John McLoughlin's claim at Oregon City and wrested most of it away from him though he, as the Hudson's Bay Company's Chief Factor, clearly had established the prior right to the site.

In the 1840s steady streams of emigrants from the United States began their treks across the continent to western Oregon. They came in good numbers. Reportedly nearly 900 arrived in 1843; more than 3,000 crossed the Oregon Trail in 1845. Oregon had taken on a magic allure and soon these settlers spread out through the land, renaming the old Indian places, felling the trees, killing the game, and making it a new American frontier.

**Motivations**

For the first generation of non-Indians, the inducement to move into the lands which in 1880 are bounded on the east and west by acres managed by the Salem BLM District was the result of orders from employers. Such was the case for the Astorians who in December, 1811, left their new post at the mouth of the Columbia for the Willamette Valley. The exigencies of tight quarters and a shortage of food were balanced by the possibility of establishing a lucrative trade or trapping field above the falls of the Willamette. These men went probably to the vicinity of present Salem where they constructed a rude shelter known as Wallace House (Hussey 1967:23-24).

The successor settlements--Willamette Post (1813) and Champoeg (early 1820s)--were both located on the northern edge of French Prairie. The men who occupied these sites were
again employees of the fur companies. They were sent into the Willamette Valley to carry out a job. Some, such as Thomas McKay, may have also established temporary field posts at the southern end of the valley or in the Umpqua watershed as early as the mid-1820s (Hussey 1967:35-37).

The rolling meadows of French Prairie, the Tualatin Plains, and the Chehalem Valley were the attraction which by the late 1820s and early 1830s drew former mountain men as settlers. Aging and unwilling to leave Oregon, these men took up farms on open grasslands in western Oregon. Of these three locations, French Prairie was clearly the most popular. Bounded on the west and north by a gentle turn of the Willamette River, it was a fertile site of several thousand acres. Groves of oaks and firs fringed the fields and afforded building materials, fence rails, and good habitat for deer and elk. The motivations for settlement were clearly more attractive in the Willamette Valley than a laborious return over the Rockies to old haunts but vaguely remembered in Canada or the United States (West 1944:198-209).

The missionaries of the 1830s came, of course, with the inspiration of converting the Indians to Methodism or Catholicism. These men and women were born of a generation fired with an enthusiasm to "preach the word." The Willamette Valley and its agricultural potentials seemed ideally suited to the Methodists and in 1834, upon the urging of Dr. McLoughlin of the Hudson's Bay Company, they settled at Mission Bottom on the southern edge of French Prairie. In 1839 the Catholics picked St. Paul, a site among the French-Canadians residing on the prairie. The coincidence of mission potentials and a means of sustaining themselves through farming, hunting, and occasional trading with the fur companies or the Indians fostered these settlements (Johansen 1967; Hussey 1967; Dobbs 1932; Lowenberg 1976).

The overland American emigrants began arriving in 1841. James Nesmith, a traveler of 1843 who settled on Rickreall Creek, reflected upon the motivations for such a journey:

Then it may be asked, why did such men peril everything—burning their ships behind them, exposing their helpless families to the possibilities of massacre and starvation, braving death—and for what purpose. I am not quite certain that any rational answer will ever be given to that question (Nesmith 1876).

The reasons for the journey, in spite of Nesmith's musings, were many. One was the result of successful advertising or propagandizing of the attractions of Oregon Territory. Such was the impact, for example, of the book which emerged from the travels in Oregon in 1835 of Rev. Samuel Parker. Seeking a field for the American Board of Commissioners for Foreign Missions, Parker and Marcus Whitman had visited the Far West. In 1838 Parker published his Journal of an Exploring Tour Beyond the Rocky Mountains. . . Containing a Description of the Geography, Geology, Climate, Productions of the Country, and the Natives, Manners, and Customs of the Indians: With a Map of Oregon Territory (Parker 1844). This volume, those of Thomas Nuttall and John Kfrk Townsend, and the lecture tour of the east in 1838 of Rev. Jason Lee all helped to publicize Oregon and its resources (Brosnan 1932).

Patriotism also helped attract some to Oregon. Many Americans were aware in the early 1840s of the tenacious state of the claims of the United States to Oregon. Since 1818 the region had been a joint sphere of influence for Great Britain and their country, yet the presence of the Hudson's Bay Company and that firm's retired employees seemed to tip the balance in favor of British sovereignty. Hall Jackson Kelley sought by the late 1820s to find "3,000 sons of American freedom" to follow him to Oregon to thwart the machinations of the British in the region (Powell 1919:3).

Land hunger drew others out of the United States. Many Americans had chafed at land laws which required payment in specie for tracts as large as 640 acres. Then in the early 1840s Senator Lewis Linn of Missouri, a dedicated expansionist, touted the possibility of a "donation" land act, a measure which would give lands to those loyal Americans who would emigrate westward and occupy Oregon. Linn's 1843 proposal would have provided 640 acres for each married couple and an additional 160 acres for each child they brought to Oregon. Although the Donation Land Act did not come to pass until 1850, its prospect helped draw some to the region (Carey 1922:1:435).

Jesse Quin Thornton, who emigrated in 1844, recalled in later years that a variety of motivations impinged upon those who came to Oregon:

Many who had large families of children (for these seemed to be as numerous here as the birds among the bushes) were removing to Oregon with the hope of finding a more salubrious climate than the one they had left, and of obtaining from the government of the United States a grant of land which
would enable them to maintain their families in a honorable independence. Some had become involved in pecuniary embarrassments, and having sold their property to pay their creditors, could not consent to remain where they must necessarily see their former pleasant homes in other hands... Others had during a long time, their yearly acquisitions taken from them by eager creditors who had thus crippled their resources, depressed their energies, and deprived them of all hope of either paying their debts or of being able to educate their children... Some were actuated by mere love of change; many more by a spirit of enterprise and adventure; and a few, I believe, knew not exactly why they were thus upon the road. With these reasons, were more or less mixed up as a very important element,—a desire to occupy the country as a basis of title in the dispute between the government of the United States and that of Great Britain (Thornton 1879:36).

Slavery as an onerous institution and as a competing force in the marketplace may have encouraged others to come to Oregon. Some blamed slave labor on their own economic difficulties. Others found a moral indignation at the presence of the institution and, when abolitionist efforts made little headway in the 1840s, they concluded to leave the country. Jesse Applegate, a leader of the 1843 emigration who settled what was to become Polk County before removing to the Umpqua Valley, vehemently insisted that slavery was a major factor in inducing him to come to Oregon (Applegate 1852; 1914).

Medora Crawford, a settler in the Yamhill Valley in 1842, later expressed his reasons for emigrating:

For myself, having nothing to lose, and knowing nothing of the responsibilities of family or dependents, I had but little thought for the adventure and advantages offered by a new country; but after experiencing and realizing the dangers and privations to which we were subjected, I have often wondered how those having wives and children dependent upon their care and protection could venture on so blind and hazardous a journey (Crawford 1862:10).

John Minto, who emigrated in 1844, recalled that during his voyage from England to the United States he had read James Fenimore Cooper's The Pioneers; this novel so fascinated him that, as he said, "Before the end of my first year in America, I had resolved if ever opportunity served, I would go to Oregon" (Minto 1901).

A final reason drew thousands of emigrants to Oregon in the mid-nineteenth century. These were the people who were drawn along because another family member had become inspired to settle in the Pacific Northwest. Virtually all children fell into this category; so, too, did many wives. These women were often reluctant to leave family and homes. Many more dreaded the rigors of up to six months on the Oregon Trail and the cooking and care for their children in such trying circumstances. Moreover, many of these women knew that the new farm in Oregon would require years of labor in rather primitive conditions. Capital was scarce; labor was dear; the comforts of such things as window panes, furniture, schools, and churches were things "hoped-for" but probably not readily obtained. These were the reluctant emigrants who came because of the motivations of others (Johnson 1882:21-23).

Health in what was popularly believed to be a more salubrious climate may have drawn some emigrants from the malarial bottomlands along the Missouri and Mississippi rivers. The situation in that region has been graphically described by the geographer-historian William A. Bowen:

In 1806, 1815-16, and 1824-26, great pandemics of influenza swept through the upper Mississippi and Ohio river valleys, and, in 1833-34 and 1843, respectively, widespread outbreaks of this same disease occurred in Ohio's Western Reserve and along the lower Mississippi. In 1836 meningitis spread through Illinois and the surrounding territory. By 1830, measles was endemic, and in 1835-36 the population suffered from epidemic ophthalmia. Outbreaks of smallpox became so common as to be no longer especially noteworthy, and the occurrence of erysipelas, or 'black tongue,' assumed epidemic proportions in 1843, 1844, and 1845. For sheer terror, however, no disease surpassed Asiatic cholera, which advanced throughout the western states in 1832, 1833, and 1834. In rapid succession, Detroit, Chicago, Indianapolis, St. Louis, Cincinnati, and New Orleans were devastated. Mortality in many places exceeded 20 percent (Bowen 1978:19).

Countering these unpleasant realities were the glowing accounts of the weather and healthy conditions in Oregon. Many of the early travelers who recorded their experiences stressed the attractions of the region. Most glossed over the ravages of epidemics and fevers on
the Indian population and with no reservations commended to their countrymen the advantages of the Pacific Northwest (Palmer 1847; Parker 1844).

Those who emigrated to Oregon in the nineteenth century quickly began filling up the Willamette Valley in the 1840s. The thousands of new emigrants who arrived each year after 1844 shaped new communities, governments, and religious institutions. In numbers and in influence they quickly overwhelmed the small group of French-Canadians who had planted the first major agricultural settlement at French Prairie. By 1847 some of the American settlers had staked claims at the southern end of the Willamette Valley and a hardy few had taken their families over the Calapooya Mountains into the watershed of the Umpqua. By the early 1850s the settlers were moving into the valleys along Mary’s River, the Yamhill, the Clackamas, and the Santiam. The fertile valley floor acres were already filled up (Genealogical Forum of Portland, Oregon 1957, 1959).

The great majority of the early settlements were distant from the lands today managed by the Salem BLM District. Those timbered regions, many of them hillside or mountainous acres, were unattractive to several generations of settlers whose primary interest was in farming or in townsites development. Their goals were to find lands with fertile soil and sites near navigable waters. Some, who aspired to become manufacturers, selected water-power sites at the rapids and falls in the rivers. Oregon City at Willamette Falls thus became a major seat of commerce and government in the 1840s. Yet, isolated locations such as Elias Buel’s mill on Hill Creek in the South Yamhill Valley, Henkle’s Sawmill on Rock Creek at the base of Mary’s Peak, and other water-power locations had by the early 1850s drawn some away from the main valley into the foothills of the Coast Range or the Cascades (Gibbs and Starling 1951; Junkin 1967).

French Prairie

The nucleus of Willamette Valley settlements grew up on French Prairie near the North West Company’s Willamette Post. As early as 1825 several free traders, working independently but selling their pelts to the Hudson’s Bay Company, resided in this area. They may not initially have tilled the soil. Instead they survived by hunting and perhaps by trading with the Indians for fish. Within a few years, however, the meadows drew these men not only to raise horses but also to plant crops. Peter Skene Ogden, the brigade leader who led one of his expeditions through the valley, commented on July 17, 1825, about the region’s potentials:

--a finer Stream than the Willamette I presume is not to be found in any part of the Indian Countries soil good, wood of all Kinds in abundance, and Roots Elk small Deer salmon and Sturgeon in abundance Indeed man could reside here and with but little Industry and enjoy almost every comfort (Rich and Johnson 1930:205).

About the same time that Ogden passed through the region, Etienne Lucier, a French-Canadian who had come to Oregon with the Astorians, settled on the prairie with his family. Within the next few years Joseph Gervais, Jean Baptiste Desportes McLay, and Louis Labonte had selected lands and built cabins on those meadows. In the 1830s several more former fur-seekers, among them some Americans and Englishmen, also came to the Champoeg area. In 1835 Webley Huaxhurst, a former fur-seeker and traveling companion of Ewing Young, erected a grist mill at Champoeg. This was the first manufacturing plant in the valley (Hussey 1967:67-76).

In 1841 Charles Wilkes, who explored the region for the American government, reported that the settlement included settlers scattered across the prairie, the Catholic and Methodist missions, George Gay’s residence on the west bank of the Willamette, and one or two brick kilns. While Wilkes found the structures occupied by these former settlers crude and sometimes lacking in cleanliness, he clearly sensed that the community was permanent. The people liked their locations and were, in their own ways, finding fulfillment. “The most perfect picture of content I saw,” wrote Wilkes, “was a French Canadian by the name of Le Xonte, on the Yam Hill river, who had been a long time in the service of the Hudson’s Bay Company” (Wilkes 1845:4:358).

Although the early settlers of French Prairie did not prosper in terms of riches, many did find the settled life and contentment which apparently showed forth in Louis Labonte. With their Indian wives and many children, these “dropped anchor” in the Oregon Country. Momentarily, in the early 1840s, they held political power in the shaping of a Provisional Government to handle the affairs of the region south of the Willamette Falls. Soon, however, they were outnumbered and submerged in the larger population of English-speaking Americans who poured in each year after 1844 (Hussey 1967).
By 1850 many of the lands adjacent to the various administrative units in the Salem BLM District were occupied by a new generation of settlers. The great majority of these people—living outside the enclaves of old fur-seekers who had settled at French Prairie and in limited numbers in the Chehalis Valley and on the Tualatin Plains—were travelers of the Oregon Trail. These were the men and women who were driven by a variety of motives to uproot their families and head out for, as one of them put it, "the sundown diggings of the West."

This generation of settlers left a large record of its activities. Several dozen of these "pioneers" kept journals or wrote reminiscent accounts of their adventures. Many, indeed more than 7,000 of them, claimed lands under the Donation Act of 1850 and in that filing created a record about their places of birth, marriage, and other biographical data. These people also appeared in the 1860 Census for which surviving schedules include population, agricultural, and industrial data. Altogether, the documented records of these individuals and families is so complete that it is possible to draw a very accurate, quantitative profile of these people in 1850. Such has been just the project of geographer-historian William A. Bowen in his "Mapping An American Frontier: Oregon in 1850" (Bowen 1975) and The Willamette Valley: Migration and Settlement on the Oregon Frontier (Bowen 1978).

Among the many states represented in the places of origin of migrating families, Bowen found that those from foreign countries, New England, and the Middle Atlantic states were far overshadowed by settlers from the Mississippi Valley. Missouri, of all states, dominated as a place of "origin" for those in Oregon by 1850. Bowen wrote:

Although in absolute terms they accounted for more urbanites than any other state, they had little propensity to settle in towns, approximately half the frontier average. Numerous Missouri farm families located on the lowlands of Sauvie Island and the Columbia River south of Fort Vancouver. Above the falls, they dominated the valleys of the Tualatin, Yamhill, Rickreall, Luckiamute, Calapooya, and Yoncalla rivers. They were also by far the largest group between the forks of the Santiam River and to the north through the Molalla Hills. In Polk County the concentration was exceedingly great. Along the Rickreall and Luckiamute more than 80 percent of the households included natives of Missouri (Bowen 1978:50).

Bowen also found that this frontier society was tightly woven together by the "glue" of past friendships in the East but especially by kinship. Large and extended families, intermarriage, and the recognition of "cousins" to many degrees tied these people to one another even on a newly settled frontier. Building on these ties was the sense of neighborhood. Bowen has concluded:

Multiplied over and over again, the neighborhood was one of the most basic associations of rural frontier life, a union of persons with similar backgrounds in small, fairly homogeneous communities, each slightly different from the rest. The frontier experience in Oregon was not one that broke down existing social structures. If anything, it tended to strengthen them. Through membership in a clan all the necessities of human survival in the wilderness were most certainly obtained (Bowen 1978:53).

The result of this interplay of family and neighborhood was that even though the population was thinly scattered across the valley on mile-wide Donation Land Claims the community was held together. Solid support systems, especially in the rural settlements. Those who lacked these "systems" either had to marry into a family and nexus of relationships or else move to one of the territory's urban settings. Bowen has concluded: "Thus, the stage was set for the development of two dissimilar frontiers—one, a rural frontier characterized by clans of westerners; the other, an urban frontier, drawing its members disproportionately from the ranks of unmarried men from the Northeast or abroad" (Bowen 1978:53).

A further characteristic of the profile of Willamette Valley population in 1850 emerges from the data base—the imbalance of the sexes in the white community. Again, a subject of analysis by Bowen, this researcher has found:

Of a total population of 11,873 persons, 7,202 were men and only 4,671 were women—a sex ratio of 154.2 males per 100 females. As the skewed diagram demonstrates, the preponderance of men was not evenly distributed with respect to age, but was concentrated among adults above twenty years. In this group
the ratios of men to women ranged between approximately 202 and 264 per 100 (Bowen 1978:53).

A close scrutiny of the figures reveals that the urbanites were by far more male--some 69.4 percent as compared to 57.9 percent figure for the rural areas. Thus, in the towns of frontier Oregon Territory in 1850, the extremes of the population profile were most clearly evident. This frontier in the decade of the 1850s was clearly male-dominated, especially in urban settings.

Bowen has been able to link the preponderance of males in the urban areas to economic activities carried out in those places or settlements. He has written:

The propensity for young, single men to reside more in some communities than in others is attributable to the varying economic attractions of each. In towns along the Columbia River the stimuli of trade and milling were augmented by competition between town speculators. Promoters at St. Helens, Milton City, Portland, and Milwaukie hired men to improve their townships. Forests had to be cleared from the land and lumber sawed. Warehouses, stores, and residences were raised and many other improvements made. To divert trade from their competitors, boomers even subsidized road construction (Bowen 1978:58).

By using the original cadastral Survey maps, held by the Bureau of Land Management Archives in Portland, Oregon, and the Federal Archives Center in Seattle, Bowen has also carried out a unique recovery of data about the choice of places for settlement by the population occupying rural areas in 1850. The maps and surveyors' notes included data on vegetation, meadows, swamps, rivers, bottomlands, and other ecological features. Although regular field burning by Indians diminished rapidly in the 1830s and 1840s because of the population decline and later because of the opposition by the builders of split rail fences, little of the Willamette Valley had altered significantly in distribution of prairie and forested area by 1850. "By 1850," wrote Bowen, "the correlation between vegetation and settlement was firmly established. More than 90 percent of the farms had been established within the grasslands" (Bowen 1978:60-61).

Bowen's finding in this regard is extremely important in explaining the low level of recorded historic activity on those lands administered today by the Salem BLM District. Those forested lands, often at an elevation of 1,000 or more feet above the floor of the Willamette Valley or its feeder river bottomlands, were--from the first decade of extensive white settlement--deemed unattractive. "Whether along the banks of a major stream, such as the Santiam, or in the more restricted bottoms of a small west side tributary, the pioneers located in grasslands," concluded Bowen. He added:

Many of the fewer than ten percent who chose to settle outside the prairies laid out claims in the oak openings and other sparsely timbered areas which, although classified in the early surveys as woodland, were quite open and easily cleared for cultivation. The remainder of the forest claims were associated with either logging operations or with water-driven mills, located along the Willamette River and its tributaries. Prior to 1850, probably less than a dozen farms in all of western Oregon south of the Columbia were hewn out of anything approaching dense forest. Thousands of acres of unclaimed prairie made forest clearance unnecessary, and except for land near the few small lumber mills, timber had little monetary value (Bowen 1978:61-62).

Settlement Patterns by 1870

Although not founded upon the impressive quantitative basis of Bowen's study of the Willamette Valley in 1850, it is possible to project an altering settlement pattern in western Oregon and especially the Willamette Valley and its environs by 1870. By that year the prairie lands and even the oak grove settings were filed upon. As early as the mid-1850s settlers had taken up claims in the last of the open bottomlands along the Mary's River, Rock Creek, Crabtree Creek, and the Molalla River. What was to happen to a new generation born to that prolific overland pioneer group?

That new generation as early as 1860 began a reverse migration eastward over the Cascades to Central and Eastern Oregon. Aware of the lush bottomlands of the Warner Valley, the Klamath Basin, Silver Lake, Sumner Lake, and Ochoco country, and other sections of the Columbia Plateau, these young married couples--and some single men--saw their futures in establishing agrarian enterprises where land was yet available. The passage of the Homestead Act in 1862 and the emergence of transcontinental rail ties by 1869, stimulating the movement of cattle south to the Union Pacific-Central Pacific route
through Nevada and into the Sacramento Valley of California—were further inducements for a landless but ambitious generation to seek out new frontiers (Minor, Beckham, and Toepel 1979; Toepel, Willingham, and Minor 1980; Toepel and Beckham 1978).

Some of those of that generation, however, did not want to leave aging parents and the communities in which they had grown up. Further, new emigrants continued to pour into western Oregon. Some of those who were now were seeking lands under the Homestead Act. Others were attracted by the sale of lands granted to Oregon and passed on by the state to the builders of the Willamette Valley and Cascade Mountain Wagon Road, the Oregon Central Military Wagon Road, and the Oregon and California Railroad. These were the people who in the 1870s began the laborious and sometimes overwhelming struggle to wrest farmlands from the dense forests along the lower reaches of the Cascades and Coast Range. Slowly, steadily, between 1870 and 1900 these people moved into the hill country. Many, of course, found the tasks too burdensome. Their homestead filings were often followed by relinquishments—they gave up. Others, of course, sold out, often to individuals who saw the stands of fir a far greater asset than the stump clearings where people might grow crops.

The course of this new pattern of settlement has not been well assessed by historians. A few amateur writers have penned impressions of their parents’ labors and their own childhoods in these settings in the homesteads of the backcountry at the end of the nineteenth century. These accounts often appear in the publications of the county historical societies. Among those journals which have carried such narratives are Marion County History, Clackamas County Historical, Polk County’s Historically Speaking, Washington County’s Land of Talent, and Columbia County History. Reminiscences especially those recorded from the homestead generation in the 1930s by W. P. A. workers, made up much of Tillamook History (1975) and Tillamook Memories (1972).

A major research opportunity awaits the historian or geographer who seeks to employ the models developed by William Bowen on the data existing for a second generation of western Oregon settlers. In addition to land and census records, those who sought homestead lands even had the guidance of such a regional journal as the now largely forgotten periodical Little Logged Off Lands, later known as Logged Off Farms Magazine. The editors of this timely journal advised would-be homesteaders on how to chop, blast, and pull out stumps or how to build a home in a hollow log. Such were the joys of homesteading!

Several of the Salem BLM District administrative units contained lands which were adjacent to or were affected in small ways by this later generation of settlers. In some instances the BLM lands were ones which were crossed by trails or wagon roads. Sometimes these lands were homesteaded but relinquished by frustrated individuals who concluded that the challenges were insurmountable. Occasionally BLM lands were used for recreation purposes by this new generation of settlers as well as by the people who lived on farms in the larger valleys or in urban areas of the Willamette Valley. Increasingly by World War I the BLM lands were adjacent to or were the forest lands logged by companies tapping the timber resources of the Pacific Northwest.

Columbia Planning Unit

The BLM’s Columbia Planning Unit is located primarily in the hill region between Vernonia and St. Helens on the north and the Tualatin Plains to the south. Once heavily forested, the area was removed from the earliest areas of white settlement because of its timber, terrain, and difficulty of access. In the 1840s and the 1850s the nearest claims of whites were at least three or four miles outside of the unit area. The establishment of white occupancy in the unit did not occur in any significant way until the 1870s.

Sauvie Island, to the east of the unit, attracted the attention of the Hudson’s Bay Company. George Simpson, the director of North American operations for the firm, handed down orders that as much as possible the company posts were to be self sufficient, especially in food supplies. The lush meadows of this swampy island were ideal for grazing the herds to feed the employees who lived across the river at Fort Vancouver. In the 1830s a company men named Sauve came to the island to manage the herds. In 1834-35 Nathaniel J. Wyeth, an American, established Fort William on the Multnomah Channel on the southwest side of the island. Although Wyeth’s venture did not prosper, other Americans within a decade came to the island and staked their provisional land claims (McArthur 1974:748-49).

Equally attractive for some overland settlers were the meadows and woodlands facing the Multnomah Channel and the Columbia River near the mouth of Scappoose Creek. Henry M. Knighton came to the site of St. Helens in 1846. He found that Bartholomew White, who
preceded him, had already erected a small grist and sawmill. Knighton eventually gained ownership of the location and in 1849 began platting the town. In 1852 he convinced the Pacific Mail Steamship Company to build a dock and make St. Helens a regular passenger stop. While Knighton's vision of a good road via Cornelius Pass to his town did not materialize in time to draw the commerce and products of the Tualatin Plains away from Portland, his community survived and became the seat of government for Columbia County (Anonymous 1861:16-17; Lockley 1928:1:311-14).

The Tualatin Plains to the south of the Columbia Planning Unit were settled in the early 1840s. In December, 1840, Robert Newell, Joseph Meek, William Doughty, and Caleb Wilkins decided to bring their Indian wives and children to these Tush Meadows. Within three years dozens of overland emigrant families poured into the region. Their claims soon reached across the entire floor of the plain to the distant foothills of the Coast Range (Benson 1975; Beckham 1975a).

The upper Nehalem Valley was not occupied by whites until the 1870s. This "back" country, dark with forests of fir, fit the pattern of becoming more desirable as a place of settlement only when the more attractive and open areas on the Tualatin Plains or along the Columbia River and its islands were all claimed. In 1874 the Clark Parker family homesteaded one mile east of the lower town of Vernonia. Parker, a good hunter and trapper, liked the region. So did others. By 1876 enough families had selected claims and brought in children for the community to erect a school and hire a teacher (Garner 1970:21-22). Vernonia was settled in 1876 and became a post office in January, 1878 (McArthur 1974:576-77).

Much of the upper Nehalem country was difficult to travel through. The first major route was the Westport Trail which was used from 1860 until the mid-1870s. Too steep for wagons, this route which led from the lower Columbia enabled a number of families to get into the region. Between 1874 and 1880 a new trail was laid out from Mountaineastle on the north edge of the Tualatin Plains up East Dairy Creek and over the Green Mountain Divide into the watershed of Pebble Creek. By 1880 this route had been sufficiently cleared and graded to enable travelers to take wagons into the headwaters of the Nehalem. In late 1880, however, a wind storm toppled more than 400 trees over this road. At this point the early residents of the area opened a new wagon road via West Dairy Creek to Vernonia (Becker 1972:20-29).

The pace of white activity in the Columbia Planning Unit increased after 1910 as logging became increasingly important in the hill country of the Nehalem region and the headwaters of the Clatskanie and Scappoose. In 1913 Korry Logging Company built a rail road from Woodson on the Columbia River to Hst. The route, which required a tunnel 1,800 feet long, opened up the remote region to the Columbia River (Peterson et al. 1970:34-35). In 1922 the Spokane, Portland, and Seattle Railroad entered Vernon in via West Dairy Creek (Becker 1972:29). Two other logging railroads eventually also extended into this area and passed through the Columbia Planning Unit. In the 1920s the Brix Log Company Railroad climbed west from Multnomah Channel into the Dixie Mountain area (Swender 1928). In that same decade the Portland and South Western Logging Railroad ran from Vernon in via Scappoose Creek across the planning unit to Chapman's Landing on the Multnomah Channel (Swender 1928; Barney 1929).

Those who lived in the Columbia Planning Unit were usually homesteaders. Initially these families survived by hunting, growing a garden, cutting cord wood and shingles, and running a few livestock. By 1870 Columbia County had 99 farms and 2,053 improved acres. By 1890 the farms totalled 385 with 20,028 improved acres. Although many of these new agricultural lands were along the Columbia River, especially in diked areas, some of the changes were the result of families moving into the hillside farms such as those in the upper Nehalem region (Nelson 1901:30-31).

**Nestucca Planning Unit**

The Nestucca Planning Unit includes some lands in the watersheds of the Klickis, Wilson, and Trask rivers which pour into Tillamook Bay and a large area of land in the eastern watershed of the Nestucca River. The lands are mostly mountainous, forested regions of the Coast Range.

White settlement in Tillamook County began in May, 1851, when Joseph Champion traveled south from the Clatsop Plains to make his claim among the Salish-speaking Indians on the shores of Tillamook Bay. Over the next three years several other settlers followed. Seventeen Donation Land Claims were filed in the county before the expiration of the act in 1855. The region was very isolated, however, and its development was extremely slow. Tillamook Bay was primarily a fair weather harbor with a shallow
bar. Only treacherous trails such as one around Neahkanie Mountain or through the Coast Range via the Nestucca Valley connected the region to the rest of Oregon (Orcutt 1951; Anonymous 1972:4).

Legally the largest part of the Nestucca Planning Unit was closed to any white settlement until 1875. The region from Cape Lookout to the crest of the Coast Range and south for nearly 125 miles had been set aside as an Executive Order Indian reservation in 1856. The Siletz or Coast Reservation was homeland not only for the native inhabitants of the central coast of Oregon but also for the 2,000 survivors of the Rogue River Indian wars of southwest Oregon who, in 1856, were relocated on this land. Intense white pressure during the 1860s and the 1870s resulted, however, in the diminishing of the Indian land base. Twice—in 1865 and again in 1875—by Executive Order and by Act of Congress the reservation was reduced. The second action opened all of southern Tillamook County for white settlement during the summer of 1875 (Beckham 1975b).

In the 1870s many new white families began moving into the Tillamook region. While the earliest settlers had traveled the coastal trail around Neahkanie Mountain (Dicken 1971:22-27), the new pioneers came over the Trask River Road. Developed as a stage route in 1872, this road traveled travelers from the North Fork of the Yamhill River over the Coast Range and down the Trask River (Noddux 1976:17; Boje 1975:49). In this decade many white families filed for homestead lands in the Nestucca Valley, a process which continued in the 1880s (Anonymous 1972:78-79).

Alexandria Rock recalled that her husband, J. B. Upton, Charles W. Upton, Chauncey Ferguson, and Watkins Bryan—all of Oregon City—homesteaded on the Little Nestucca in 1876. These men and others came over the Gaulty or Baldy Trail, an Indian route which led from the Grand Ronde Reservation westward on the high ridges to Mt. Gaulty and the lower Nestucca Valley (Rock 1949:5). When she came to the Little Nestucca in 1887, Mrs. Rock recalled that she took the narrow gauge railroad to Sheridan, a stage coach to Grand Ronde, and a horse the rest of the way. Not even a wagon road had been built through to the coast at that date (Rock 1949:2-3).

Life for these early settlers in the Nestucca Planning Unit was arduous. Weeks, months, and years of labor had to be expended to wrest openings in the forest. Their homesteads were "stumps" on which they eked out an existence. Many of these people supplemented their incomes by peeling cascara bark, picking foxglove for medicinal sales, or cutting ferns to sell to florists in urban areas. Their entertainments were simple: dances in private homes, box socials, a charivari to celebrate a marriage, or sporting events which included baseball, horseshoes, or foot races (Rock 1949:6-7, 33).

In the 1890s some economic stability came to the region with the development of cheese factories. A plant opened in Cloverdale in 1894. Cheese manufacturing gave the dairymen of the region a way to sell milk in a form that could be preserved and shipped to outside markets. Eventually, too, in the early twentieth century logging and sawmilling came to Tillamook Bay and these enterprises, especially at Hobsonville and Garibaldi, created jobs for the men of the Nestucca country (Anonymous 1972; Orcutt 1951; Boje 1975).

**Willamina Planning Unit**

Most of this unit is located on the east side of the Coast Range at higher elevations. The region was once heavily forested and not initially attractive to the early generations of settlers who came to the nearby Willamette Valley in the mid-nineteenth century. The valleys of the Tualatin River and the North and South forks of the Yamhill drew some Donation land claimants into the foothills of the Coast Range in the early 1850s. A half dozen of these early settlers selected lands in Patton Valley within a mile or two of some BLM lands. Many more settlers went to the Yamhill District. The county, in fact, raised nearly fifty men to fight in the Cayuse Indian War in 1847-48 (Beckham 1975a; Cooper 1899; Nixon and Tupper 1977).

In 1851, the treaty commissioners obtained cessions of land from the Tualatin and Yamhill bands of Kalapuya Indians and set aside reservations at Wapato Lake and a large parcel of hill land south of Panther Creek. This second reservation embraced several sections of land administered by the BLM in the Willamina Planning Unit. The tract was not, however, ever set up as a functioning reservation and the negotiations of the treaty commission were abrogated by Congress later in 1851 (Mackey 1974).

The red clay hillsides adjacent to the BLM lands in this unit became attractive to homesteaders when prune cultivation became economically worthwhile in the 1880s. Martin Peterson of Carlton wrote:
Orchards were planted and soon the prunes were ready for picking. A man would use a long pole with a socket to hook over the limb and shake the prunes off. The pickers would come along and pick up the prunes. They were put in boxes and taken to a prune dryer (Carlton Elementary School Bicentennial Club 1976:19).

The hillside areas were ideal for prune production. Requiring less water than cereal crops and well adapted to the clay soil, the prune trees within twenty years covered hundreds of acres in Washington and Yamhill counties. Dozens of farmers constructed prune dryers with their brick chimneys puffing out smoke in August and September. Hundreds of workers came in for the harvests and placed the prunes on the woood racks which were shuttled back and forth in the drying buildings (Beckham 1975a).

In the nineteenth century some sawmill work and logging attracted a limited population into this unit. In the 1850s Oliver H. Adams operated two mills on Panther Creek. King and McCullough did so in 1873. In 1865 George W. Jones constructed a sawmill "in the mountains on Panther Creek" (Carlton Elementary School Bicentennial Club 1976:43). These ventures had their parallels with the Lee family mill at Lee Falls on the Tualatin in the 1850s and other small operations which cut for a limited, local market (Beckham 1975a). In the early twentieth century, however, large scale logging of the eastern flanks of the Coast Range resulted from August Lovegren's building a mill at Cherry Grove and the Carlton Lumber Company's mill, erected in 1906 on the North Fork of the Yamhill River at Carlton. These ventures and their successor firms attracted settlers to the foot of the mountains and drew loggers into the hills for several years of cutting and log transport (Carlton Elementary School Bicentennial Club 1976:44).

Rickreall Planning Unit

The lands of the Rickreall Unit lie primarily on eastern slopes of the Coast Range in the watersheds of Rickreall Creek and the Luckiamute River. Scattered parcels in this unit, however, are located on the western side of the Coast Range in the drainages of the Siletz River, Schooner Creek, and the Salmon River.

Until the agreement in 1892 to extend the Dawes Severalty Act of 1877 to the Siletz Reservation, most of the BLM lands west of the Coast Range in this unit were closed to any white settlement. After allotment distributed 44,000 acres of the reservation to the Indians, nearly 200,000 acres in this western area were opened for homesteading and sale. Between 1892 and 1916 a fairly brisk period of settlement occurred in this district, especially west of the summit. Many of the claims were fraudulent entries made by bogus or dummy entrants who for a fee signed their name in order to get public domain with no intention of settling or improving upon the parcel. These parcels were part of the infamous "Siletz Land Frauds" which resulted in several criminal investigations and prosecutions at the turn of the twentieth century (Puter 1908; Messing 1966; Beckham 1978).

A. W. Morgan, one of those who homesteaded on the west side of the mountains in 1904, later recalled what was happening in the Rickreall unit:

The township line ran along the east side of my claim, and after we got settled and had time I went up into 8-9 and found cabins on all the quarter sections and trails all over from one cabin to another. These settlers had come in from Dallas and Fall City, made trails down the South Fork to the main Siletz River, and had a foot bridge across the river. Some of them had made a trail down Sunshine Creek to the river and had a hanging foot bridge there. Nearly all of these had served their time on their claims and had made proof, but most of them had been held up and had not got their patents and had trouble getting them later on, which I will tell you about later on... (Morgan 1959:8).

According to Morgan dozens of families, many of them coming over the Sunshine Trail north from the communities at Fall City, had cast their fortunes on timber claims in the Siletz watershed. For a few, the years of labor in the forests were worthwhile. Eventually they sold their timber to the Johnson Lumber Company of Toledo or to mills in Valley, Falls City, or Dallas. Many, however, relinquished their claims because they could not endure the isolation or were unable to get clear title from the land office (Morgan 1959).

Immediately east of this unit the valleys of the Rickreall and Luckiamute were quickly settled in the 1840s. A number of the immigrants of 1843 moved into this district. They found vast open areas, in part a product of the annual field burning carried out by the Indians. Further, the falls of Rickreall Creek enabled several enterprising "mechanics"
to establish mills for cutting lumber and grinding grain (McArthur 1930; Applegate 1914; Glen 1926).

In the early twentieth century logging drew increasing numbers of people into the forested regions on the eastern slopes of the Coast Range in this unit. By 1910 the Salem, Dallas, Falls City and Western Railroad reached to Black Rock and served the Willamette Valley. The Alsea Valley and Siletz Railroad eventually opened up much of this mountainous region. Valsetz, a company-owned town, grew up far into the Coast Range as a place of residence and work for those who tapped the timber resources of the Rickreall Unit (Anonymous 1947:22-23).

Alsea Planning Unit

The Alsea Valley is located primarily on the west side of the Coast Range in the watershed of the Alsea River south of Mary's Peak. This is a region of broken hillsides and ravines which was once heavily forested. In the lower elevations closer to the Pacific Ocean were dense stands of Sitka spruce. The principal bottomland in the area is the Alsea Valley located near the headwaters of the Alsea River.

A number of Donation Land Claims were filed in this area prior to the creation of the Siletz Indian Reservation in 1856. The bulk of these claims were made in the Alsea Valley and until the Executive Order of 1865 which opened a section of land 20 by 30 miles wide through the center of the reservation--to provide white access to Yaquina Bay--no white settlers lived west of the valley. In 1875 Congress closed the Alsea Sub-agency and opened the entire southern section of the Siletz Reservation to white settlement. Slowly pioneer families moved on westward along the river and to the coast of what became Lincoln County (Beckham 1977).

David Fagan wrote about the lands surrounding the valley, a region which remains in fairly extensive public domain and administration by the BLM. In 1885 he said:

Contiguous to the valley of the Alsea is a considerable quantity of partially settled country. For eight or ten miles to the southward, until Lobster Creek is reached, the land is rolling and productive; while along the valley last-named there is a general settlement, but plenty of room for more. To the east of the valley, along the line of the south road, there is also a fine open country, the same remark applying to that on the North Fork of the Alsea river (Fagan 1885:498).

The nineteenth century settlers, some of whom came to the upper Alsea region as early as 1852, traveled back and forth to the Willamette Valley via the North Fork of the Alsea and the South Fork of Mary's River. About 1880, however, the residents of the area opened another road to the southeast to Monroe. Over these routes the settlers exported flour ground at Ruble's Mill, established in 1873 at the upper end of the Alsea Valley or, after 1884, from the Lone Star Mill on Mill Creek. Both Ruble and Jnmon, whose mill stood on the South Fork of the Alsea River twelve miles west of Monroe, cut lumber. Most of the lumber was probably sawn for local use (Fagan 1885:500).

Clackamas Planning Unit

The scattered lands in this unit are located on the east side of the Willamette Valley and in the watersheds of the Clackamas and Sandy rivers. The parcels are lower foothill terrain of the western slope of the Cascade Mountains.

White activity in the Clackamas planning unit commenced early in the period of overland emigration and settlement. In 1845 Samuel K. Barlow and Joel Palmer, determined to find a route to the valley of the Willamette which would avoid the treacherous water descent through the Columbia Gorge, blazed a trail and attempted to bring wagons around the southern slope of Mount Hood and down the Zigzag and Sandy rivers. Although they had to abandon their wagons near Barlow Pass on the east side of the crest of the Cascades, they did find a route and several families of emigrants packed their belongings on through over the new trail. The next year, supported by a prospect of opening a toll road, Barlow and others cleared the Barlow Road and that fall led the first wagon trains through by land to the Willamette Valley. This route passed by or crossed BLM lands in the Wildwood, Brightwood, Marmot, and Alder Creek region. The Barlow Road remained in use as a toll road until 1915 (Beckman 1978).
In the early 1840s settlers who had crossed the Oregon Trail began filing provisional claims on lands in the valleys of the Molalla and Clackamas rivers. These stream courses, once they entered the Willamette Valley, possessed fertile bottomlands and, in some places, large open meadows. The bucolic nature of this region is well reflected in the place names which soon became fixed for it: Dickey Prairie, Glen Avon, Rural Dell, Shady Dell, Fallsview, Echo Dell, and Fernwood (McArthur 1974).

The early generations of emigrants spread out over the valley floor. Next they moved into the bottomlands of the tributary streams. A few men of enterprise pushed back into the hills to waterfall sites to find power to operate grist mills and sawmills. Union Mills on Milk Creek near the Molalla River was a site developed by Gabriel J. Trulinger in 1852. He erected a sawmill, planing mill, and machinery for carding wool. Scott Mills on Butte Creek became the site of Thomas Scott's sawmill and grist mill erected about 1866. Slowly but steadily in the 1860s and the 1870s settlers moved into the Cascade foothills (McArthur 1974:553, 749).

As in other rural areas of western Oregon, the passage of the Homestead Act in 1862 set the stage for a restless generation of settlers to file upon forested lands in remote areas. In the 1880s and the 1890s dozens of such filings were made in the foothills of the Cascade Range. Along the Molalla River, for example, Joe Davis went far up the South Fork and built a cabin called "The Dungeon." Davis ran sheep in the meadows near his place. Henry Russell settled approximately three miles downstream at Bee Ranch. Russell kept an apiary and thus his honey-collecting fixed the place name for the site. Two and a half miles farther west was the Wyandam claim (Hardy n.d.:15-20).

Logging also drew settlers into the Clackamas Planning Unit. Some of the early timbermen fell their trees and floated them down the rivers to the mills. Fred Shaffer, for example, logged the Coal Creek watershed and floated the railroad ties which he cut down to Canby where he fished them out. Others cut their timber in the hills with small sawmills and hauled the finished product to the markets by horse team. Charles W. Hardy, who witnessed much of this activity in Clackamas County in the late nineteenth and early twentieth centuries recalled:

The Dornbecker Furniture Company had a logging camp where the present Vegler Dam is now. That was on the North Fork of the Molalla River. They floated logs down the river for a time but it did not prove satisfactory. The need for roads and transportation was great on that day (Hardy n.d.:24).

Adjacent to BLM lands in the Columbia Gorge the Bridal Veil Lumber Company constructed large logging camps such as the town of Palmer which burned in a forest fire in the 1880s. This firm operated flumes and logging railroads to haul the timber from its lands to the railroad in the Gorge (McArthur 1974:567; Anonymous 1913).

Recreation at an early date began attracting residents of the Willamette Valley into the Clackamas Planning Unit. The development of Wilhoit Springs in the 1880s was one such location. Frank McElrath and others built a hotel, store, barn, bowling alley, dance hall, bath house for the soda water (which many visitors preferred to drink), and other improvements (Hardy n.d.:8-9; Lynch 1973:611-14). Other sites which drew visitors were Bagby Hot Springs with its team log tubs which were used from the 1910s until the late 1970s and Austin Hot Springs (Lynch 1973:614-16; Horwitz 1973).

Santiam Planning Unit

The first white settlers began moving into the valley floor to the west of the Santiam Planning Unit in 1843. This unit, embracing the Cascade foothills in the watersheds of the North and South Santiam rivers and Crabtree Creek is a largely mountainous region, broken by many small streams. The earliest settlers, as in other parts of the Willamette Valley, preferred the open meadows of the lower elevations to the challenges of clearing trees. Although few new families moved in 1844, in 1845 and succeeding years the influx of residents was steady. As in other Salem planning units, those who ventured farthest into the mountains were often the loggers or the mill operators seeking industrial sites (Down 1926).

The Illustrated Historical Atlas Map of Marion and Linn Counties (1878) shows that the hill land near the base of the Cascades remained largely unsettled, while the Santiam Valley and the main Willamette Valley were extensively taken up. Two Congressional decisions of the late nineteenth century affected, to a degree, the development of this unit. In the 1860s Congress created a land grant for the Willamette Valley and Cascade Mountain Wagon Road. This tract, passed on to a private road company headquartered in Albany, was
"Locked up" until such time that the road was certified as complete to the Idaho border and until the firm began selling its acres. Although the certification was to occur in a phased basis, the company was not readily able to liquidate its lands when homesteaders could find comparable lands for a fraction of the cost. The second act of Congress was to fund the Oregon and California Railroad with a land grant which also set aside many sections of land in the Santiam Unit for a private company to sell to subsidize its activities (Jackson 1952; Down 1926; Anonymous 1978).

On the whole the development of this unit was not unlike that of other BLM lands in the Salem District. In the early twentieth century the development of logging and lumbering, especially in the Silverton and Sweet Home areas, drew workers and residents into the Cascade foothills. The Silver Falls Lumber Company built extensive logging railroad into the region to tap its timber.

Population Trends

The foundation for human activities in the historic period in the various BLM planning units was laid in the mid-years of the nineteenth century. As the population of western Oregon increased, the potential for human presence in those areas mounted proportionately. First among these basic factors was the need for an agrarian-oriented society to find land for more farms. This desire in the 1860s through the 1890s led many into the forested hills and ravines to seek sites for new homes and farms. Second, the growth of population in the Willamette Valley and the emergence of urban centers such as Portland, Oregon City, Salem, Albany, and Corvallis meant that lumber was needed for construction. The forests in the nearby hills and mountains provided that material.

Building upon these conditions was the development of improved roads and transportation systems which enabled the exporters of lumber to transport the logs from the hills to their mills and the finished wood products from their mills to markets. This evolution of an industry was dramatically fostered with the building of extensive logging railroad systems into the various planning units in the early twentieth century. Fourth among the factors shaping human activity in these areas and an element growing directly out of white settlement in the nineteenth century was the interest of a valley population in the recreation opportunities afforded in the scenic foothills on both flanks of the Willamette Valley. Camping, fishing, hiking, drinking soda water, swimming, bathing in hot springs, and hunting all beckoned to those who sought a change of pace in life. The public lands were a magnet for recreation seekers from an early date. Further, those wilderness areas coincided remarkably with the nineteenth century American fascination with the "picturesque and the sublime." The Cascade peaks, the waterfalls of the Columbia Gorge, the gles of the Alabama Valley, the falls of Silver Creek, the steelhead-abundant Nestucca River—all of these places exhibited the delightful interplay of romantic scenery and resources which drew humans in the historic period.

The course of these events is supported by the population trends which occurred in eight counties in which the bulk of the Salem BLM lands are located (see Tables 8 and 9).

TABLE 8
Population Trends in Northwestern Oregon

<table>
<thead>
<tr>
<th>County</th>
<th>1850</th>
<th>1860</th>
<th>1870</th>
<th>1880</th>
<th>1890</th>
<th>1900</th>
<th>1910</th>
<th>1920</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>814</td>
<td>3,074</td>
<td>4,504</td>
<td>6,403</td>
<td>8,605</td>
<td>6,706</td>
<td>10,663</td>
<td>13,744</td>
</tr>
<tr>
<td>Clackamas</td>
<td>1,859</td>
<td>3,466</td>
<td>5,993</td>
<td>9,260</td>
<td>15,233</td>
<td>19,658</td>
<td>29,931</td>
<td>37,698</td>
</tr>
<tr>
<td>Linn</td>
<td>944</td>
<td>6,772</td>
<td>8,717</td>
<td>12,676</td>
<td>16,265</td>
<td>18,603</td>
<td>22,662</td>
<td>24,550</td>
</tr>
<tr>
<td>Marion</td>
<td>2,749</td>
<td>7,088</td>
<td>9,965</td>
<td>14,576</td>
<td>22,934</td>
<td>27,713</td>
<td>39,780</td>
<td>47,187</td>
</tr>
<tr>
<td>Multnomah</td>
<td>4,150</td>
<td>11,510</td>
<td>25,203</td>
<td>74,884</td>
<td>103,167</td>
<td>226,261</td>
<td>275,898</td>
<td></td>
</tr>
<tr>
<td>Polk</td>
<td>1,051</td>
<td>3,602</td>
<td>4,701</td>
<td>6,601</td>
<td>7,825</td>
<td>9,921</td>
<td>13,465</td>
<td>18,181</td>
</tr>
<tr>
<td>Washington</td>
<td>2,652</td>
<td>2,801</td>
<td>4,261</td>
<td>7,082</td>
<td>11,972</td>
<td>14,467</td>
<td>21,522</td>
<td>26,376</td>
</tr>
<tr>
<td>Yamhill</td>
<td>1,512</td>
<td>3,245</td>
<td>5,012</td>
<td>7,945</td>
<td>10,692</td>
<td>13,420</td>
<td>18,285</td>
<td>20,529</td>
</tr>
</tbody>
</table>

(Source: U.S. Census Data)
Figure 8. Hop-picking attracted extensive seasonal labor in the years 1880-1930. Many homesteaders came to the Willamette Valley to earn wages in the fields. (Oregon Historical Society Photo)
Figure 9. Many farmers erected hop barns on their properties. This view shows such a hop farm and barn-dryer in the Willamina District on the South Fork of the Yamhill River. (Oregon Historical Society Photo)
TABLE 9

Percent of Population Increase

<table>
<thead>
<tr>
<th>County</th>
<th>1850 to 1860</th>
<th>1860 to 1870</th>
<th>1870 to 1880</th>
<th>1880 to 1890</th>
<th>1890 to 1900</th>
<th>1900 to 1910</th>
<th>1910 to 1920</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>277.6</td>
<td>49.1</td>
<td>39.7</td>
<td>35.1</td>
<td>-22.5</td>
<td>59.0</td>
<td>28.9</td>
</tr>
<tr>
<td>Clackamas</td>
<td>86.4</td>
<td>72.9</td>
<td>54.5</td>
<td>64.5</td>
<td>29.0</td>
<td>52.3</td>
<td>25.9</td>
</tr>
<tr>
<td>Linn</td>
<td>291.3</td>
<td>25.7</td>
<td>45.4</td>
<td>29.3</td>
<td>14.4</td>
<td>21.6</td>
<td>6.3</td>
</tr>
<tr>
<td>Marion</td>
<td>157.8</td>
<td>40.5</td>
<td>46.3</td>
<td>57.3</td>
<td>20.8</td>
<td>43.5</td>
<td>18.6</td>
</tr>
<tr>
<td>Multnomah</td>
<td>-</td>
<td>177.3</td>
<td>119.0</td>
<td>197.1</td>
<td>37.8</td>
<td>119.3</td>
<td>21.9</td>
</tr>
<tr>
<td>Polk</td>
<td>245.0</td>
<td>29.7</td>
<td>40.4</td>
<td>19.0</td>
<td>24.3</td>
<td>35.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Washington</td>
<td>114.6</td>
<td>54.5</td>
<td>58.5</td>
<td>34.6</td>
<td>23.2</td>
<td>36.3</td>
<td>12.3</td>
</tr>
</tbody>
</table>

(Source: U.S. Census Data)

ECONOMIC PATTERNS

In some respects the lands within the Salem BLM District differ from other parts of Oregon west of the Cascade Mountains in terms of economic development in the historic period. Some types of economic activity which have been of significance in other areas are lacking almost entirely or are of very minor importance in the district. Among these categories are mining, fishing, and, to a degree, tourism. The lack of deposits of gold, silver, and coal in the Salem District have kept it from being a place of mining. The presence of the Willamette Falls at Oregon City has been a natural factor in checking the fish runs which, in other parts of western Oregon, have led to significant economic development. The presence of BLM lands in the Coast Range and Cascade foothills—but not in the higher peaks region—has cut down, to some extent, on the attractions for recreation seekers. The long line of hot springs of the Western Cascades are at an elevation that places them east of BLM lands and in those areas primarily administered by the U.S. Forest Service.

In spite of these exceptions to familiar patterns of economic development in western Oregon, the Salem BLM District embraces lands where several important events have occurred which have contributed significantly to the state's and the region's development. Among the most important of these events has been logging and lumber manufacturing. Transportation systems have, in several places, passed over BLM lands. Subsistence living—the eking out an existence by living "close to nature" and, especially, close to the land—has drawn man to the public domain to exploit resources such as game, fish, berries, or fur-bearing animals. Camping and picnicking, while not of economic importance comparable to the development of resorts and hotels in rural areas, have drawn pleasure-seekers onto some BLM lands.

Although not occurring on BLM lands per se, agriculture in the Willamette Valley has, in the long run, had significance for the Salem BLM District. The agricultural attractiveness of the region served as early as the 1840s as a magnet to draw in thousands of overland travelers. The fertile soils of the main valley and the bottomlands along tributary streams led to a rapid population growth and an economic base which sustained both a rural and an urban population. Trade centers in the Willamette Valley at Oregon City, Salem, Albany, and Corvallis emerged to ship or process the commodities produced on the farms. In turn these cities increased the need for the harvest of timber and the manufacture of lumber. Slowly, as transportation systems developed, especially with the advent of railroads by the 1870s, the lumber produced by the valley mills could pass out of the region for sale on a regional or world market. In many cases the sons of farmers left the family lands to work in mills or the woods.

Subsistence Living

From the advent of white settlement in the Willamette Valley in the late 1820s well into the twentieth century many parts of western Oregon have attracted settlers who have lived what may be termed a "subsistence" life-style. The ingredients in this way of life include in many instances living in a "homemade" house (often one built by the occupant), raising a large vegetable garden, keeping various livestock and poultry, hunting and fishing for extra foodstuffs, and exploiting the environment for miscellaneous income. Picking ferns, gathering huckleberry brush, peeling cascara bark, trapping for fur-bearing animals, selling deer hides, and picking the leaves of the Digitalis for sale as medicine are among the activities of those embracing this lifestyle. These individuals may or
may not have a source of regular income. Some have worked as loggers or seasonal farmhands. Others have had regular employment in a town or village but have chosen to live in the rural countryside in a way that differs fairly significantly from their more urban counterparts in the same county.

The origins of this way of living were to a large degree dictated by conditions in frontier Oregon. Scarcity of manufactured goods, lack of capital, and the "pioneering" attitude of many of the territory's earliest settlers naturally led them toward a subsistence lifestyle. Wallis Nash, an Englishman who ultimately settled in the Coast Range west of Corvallis in the 1870s, described the housing found in the rural areas of the Salem BLM District in the 1880s:

The regular farmhouse is by no means an uncomfortable abode. There are three kinds: log-cabin, box-house, frame-house. The first, by far the most picturesque type, is fast becoming obsolete, and on most of the good farms, if not pulled down, is degraded into woodhouse or pigsty. But to my eyes there is something rarely comfortable in the low, solid, rugged walls of gray logs, with overhanging shingled roof; the open hearth, too, with its great smoldering back-log and wide chimney, invites you to sit down before it and rest. By the side of the fireplace, from two deer's horns fastened to the wall, hangs the rifle—generally an old brown weapon—with bullet pouch and powder horn. Over the high mantel-shelf stands the ticking clock, suggesting 'Sam Slick, the clockmaker.' Curtained off from the main room, with its earthen or roughly-boarded floor, are the low bedsteads of the family, each covered with its patchwork quilt. A corner cupboard or two hold the family stock of cups and plates, and the smell of apples, from the adjoining apple-chamber, pervades the house.

This log cabin appeared in the Willamette Valley at French Prairie in the 1820s and persisted as a feature of shelter in the region throughout the nineteenth century. Indeed, even in the last wave of intense homesteading primarily for timberland between 1900 and 1915, the log cabin continued as a primary means of shelter for humans from the rigors of the environment (Nash 1881:28-29).

Many settlers, however, abandoned their log cabins as soon as they could afford either the financial outlay for milled lumber or possessed the time to whip up their own boards. Nash assessed this situation, too:

But as the farmer prospers, he it ever so little, he hastens to pull down his log-cabin and to build his 'box' or more expensive 'frame' house. In each case the material is 'lumber.' By this is signified, he it known to the uninitiated, fir boards, one foot wide, sixteen feet long, and one inch thick. The box-house is built of boards set upright, and the cracks covered with strips of similar board, three inches wide. The frame-house is double throughout; the boards run lengthwise, and there is a covering of an outer skin of planking. With the box or frame house comes the inevitable stove. The cooking and eating of the family go on in a lean-to room, and the living-room is furnished with some pretensions, always with a sewing machine, and often with a parlor organ or piano (Nash 1881:29-30).

The "pretensions" were beyond the reach of many Oregonians, but the shift from log cabin to frame house was an event which occurred repeatedly in the region. The wet climate took terrible ravages on unpeeled logs. Improper foundations and footings inevitably caused rotting and insect damage in the log buildings. Eagerly settlers labored for the day when they could have frame houses.

Another feature of subsistence living was that this lifestyle usually required the intense labor of both a man and a woman. While the man may have hunted, worked for some wages, farmed, and tended to the livestock, the woman in such a household slaved at least as equally hard, being responsible for cooking, food preservation, the clothing, caring for the children, and numerous other obligations of a survival nature. Mary Walker, an early resident of the territory, wrote of her labors during one week in 1848:


Saturday, February 5. Have been cleaning tripe, trying tallow, dipping candles, boiling feet, etc., and have Shopshenamal to work two days and have felt so tired and sleepy at night I could not write my Journal.

Yesterday I dipped 17 dozen candles. In the evening we had preparatory meeting. But I feel that I need more than a meeting to prepare me for the communion, or anything else. My mind is so crowded with a deluge of little cares that all I can think is what shall we eat and what shall we drink and where with all shall we be clothed (Walker 1848 as quoted in Clark 1928:1:391–92).

The experiences so graphically penned by Mary Richardson Walker were undoubtedly repeated thousands of times over each year by those who had settled in the Oregon Country in the nineteenth century. For the families who were the first whites to settle in the Alsea Valley, in the upper Nehalem region, along the canyon of the Molalla River, and in other parts of the land removed from the Willamette Valley, these conditions persisted for several decades.

The dependence of these people upon the products of nature was mentioned by Alice Revenue Webster who grew up at her father's trading post on the Barlow Road in the Sandy River region. She told how her father caught salmon and trout and killed elk, deer, and bear. "Mother always had a garden," she wrote,

and kept her seeds from year to year. In the autumn the cellar would be full: cabbages hung from the rafters, carrots, rutabagas, salted salmon, dried venison, dill pickles. We made our own vinegar and soap, the latter from ashes and bear grease; we made jelly from crab apples or Oregon grapes; we preserved or dried blackberries, salmon-berrys and gooseberries and gathered wild hazelnuts. With all these riches our cellar was a wonderful place (Smith 1948:112).

Hans L. Jensen recalled in the 1930s the rigors of homesteading in the 1870s in the Willamette region and on the Nestucca River. "The country was very wild with an abundance of wild animals," stated this man. His parents filed a squatter's claim and commenced to establish a home in the forest. Jensen noted:

There was no closed season on deer then. Whenever we needed meat, father would go out and kill a deer. He raised some garden after we got the land cleared. While the men were out working mother rented cows to milk for the summer, paying twenty pounds of butter for the rental. In the winter the cows were turned on the range. Mother churned the butter and we packed it in kegs on horseback to Grande Ronde where we were paid ten cents a pound for it (Anonymous 1972:58–59).

For more than eighty years "subsistence living" persisted as an important lifestyle in the Salem BLM District. For many families this existence was not necessarily of their own choosing. To learn the hardships and realities of frontier life and their lack of money dictated that they live in this way. Others, however, chose to retreat to rural areas, hunt, grow a few vegetables, and avoid the distractions of life in towns and villages.

Agriculture

The population growth of western Oregon in the nineteenth century was inextricably linked to agriculture. The potential of the region, especially the fertile Willamette Valley, was given extensive publicity in the 1840s. Traveling south through the valley from the mouth of the Luckiamute River in 1845, Joel Palmer wrote:

This is a beautiful region; from the bottom can be seen, at different points, seven snow-covered peaks of the Cascade range. The Cascade is within view for a great distance, to the north and south; which, together with the beautiful scenery in the valley, renders it a picturesque place. Thrifty groves of fir and oak are to be seen in every direction; the earth is carpeted with a covering of luxuriant grass, and fertilized by streams of clear running rivulets, some of which sink down and others pursue their course above ground to the river (Palmer 1847:94).

This fabulous countryside, much of it containing open meadows awaiting the till ing implements of the farmer, drew in thousands of farmers and raisers of stock. By 1850 beef cattle, milk cows, hogs, sheep, horses, and goats were all thriving in the valley. Many of the earliest livestock raisers—such as Swing Young in the Chehalem Valley—merely let their herds run wild. Increasingly, however, the competition between livestock owners and
farmers brought enactments by the territorial legislature requiring fencing (Bowen 1978: 74-76).

In a careful study of the various schedules of the 1850 Census, William Bowen has found specific information on the emergent livestock enterprises of the Willamette Valley.

TABLE 10
Livestock Totals in 1850

<table>
<thead>
<tr>
<th>Livestock Type</th>
<th>Total Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cattle</td>
<td>19,466</td>
</tr>
<tr>
<td>Milk Cows</td>
<td>9,761</td>
</tr>
<tr>
<td>Working Oxen</td>
<td>6,248</td>
</tr>
<tr>
<td>Horses</td>
<td>6,919</td>
</tr>
<tr>
<td>Sheep</td>
<td>4,035</td>
</tr>
</tbody>
</table>

(Source: Bowen 1978:80-86)

The bulk of these herds and flocks came over the Oregon Trail to the valley in the latter part of the 1840s. This parade of imported livestock continued steadily in the 1850s. In 1853, for example, the Indian Agent on the Umatilla Reservation observed the travelers passing over the Columbia Plateau on their way to the Willamette Valley. He reported that 6,449 people had gone by his station. They had with them 9,077 oxen, 6,518 cows, 2,009 hogs, 327 mules, and 1,500 sheep (Oliphant 1968:32). In the decade of the 1870s, however, stock raising in the Willamette Valley was eclipsed by the emergence of the ranges of Transcascadia. The Blue Bunch Wheat Grass of the Columbia Plateau and the lush bottomlands of the Great Basin regions of Oregon gave rise in that decade to large scale stock-raising supplying a regional and, ultimately with the tapping of railroad transportation, a national market (Oliphant 1968:75-114).

The development of crops as a fundamental feature in the agricultural enterprises of the Willamette Valley had also occurred by 1850. Again, using the 1850 Census schedules, Bowen has ascertained the following production.

TABLE 11
Crop Production in 1850

<table>
<thead>
<tr>
<th>Commodity Type</th>
<th>Bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>208,305</td>
</tr>
<tr>
<td>Oats</td>
<td>55,486</td>
</tr>
<tr>
<td>Beans and Peas</td>
<td>3,566</td>
</tr>
<tr>
<td>Irish Potatoes</td>
<td>61,880</td>
</tr>
</tbody>
</table>

(Source: Bowen 1978:89-92)

A golden stimulus spurred on the raising of stock and the growing of cereal crops, fruits, and vegetables. The discovery of gold in California in 1849 brought in over 100,000 people in 1849. Many of those who rushed to that area had no time or training for engaging in agriculture. Increasingly Oregon commodities by late 1849 found an excellent market in California. Dozens of Oregon farmers who had dashed to the diggings of the Sierras during the summer of 1849 returned for the fall harvests to find that their wives and children had earned perhaps as much as they had during their weeks of toilsome labor in the mines. In 1849 an estimated fifty vessels came to the Columbia River seeking Oregon products. Wheat leaped in price from forty-nine cents to $2 a bushel. As early as January, 1849, the estimates of the inflow of California gold dust stood at $400,000 in Oregon Territory (Johansen 1967:234-35).

The passage of the Donation Land Act of 1850 drew thousands of more settlers into western Oregon. The great majority of those who came to take advantage of this measure were farmers or stock-raisers who planned to continue these enterprises in the Pacific Northwest. Agricultural productivity mounted steadily in the nineteenth century. The Willamette Valley had no sizable Indian population to resist this rapid influx of settlers.
The California markets brought relatively good times for those who labored diligently. Wool production in Oregon leaped from 29,686 pounds in 1850 to 5.9 million pounds in 1880. The produce from orchards which had totalled $1,271 in value in 1850 had grown to a value of $583,663 in 1880 (Clark 1927:1:456).

In the early twentieth century a clear pattern had emerged in the primary agricultural counties adjacent to the lands of the Salem BLM District (see Table 12). The number of farms continued to grow. Between 1900 and 1920 they increased by 41.3% in an eight county area in the northern Willamette Valley. Each year the number of improved acres also increased. Between 1900 and 1910 the rate was 8.1%; between 1910 and 1920 it was 7.5%. A further figure of importance was in the area of individual ownership. In 1900 76.4% of the farms were owned by their owners. In 1910 that figure had grown to 80.6%; in 1920 it stood at 82.2%. Farm tenancy, a situation common in many parts of the United States in those decades following the agricultural distress of the populist era of the 1890s, was not widespread in western Oregon (U.S. Census Data).

The Oregon Census records—taken in the middle of each decade—chart additional trends in agriculture in the region (see Table 13). One of the most startling statistics was the explosive growth of hop raising as a major agricultural enterprise in the 1880s and the 1890s. From no production at all in the 1860s and the 1870s, the farmers of the Willamette Valley shifted considerable amounts of acreage and energy into hop growing at the end of the century. By 1895 Marion County led the state with over 8 million bushels of hops grown that year (Oregon Census Data).

<table>
<thead>
<tr>
<th>TABLE 12</th>
<th>Farm Property Trends, 1900-1920</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>Clackamas</td>
</tr>
<tr>
<td>Number of Farms</td>
<td></td>
</tr>
<tr>
<td>1900</td>
<td>863</td>
</tr>
<tr>
<td>1910</td>
<td>1,098</td>
</tr>
<tr>
<td>1920</td>
<td>1,270</td>
</tr>
</tbody>
</table>

| Acres in Farms |        |      |        |           |     |            |         |       |
| 1900       | 235,652 | 290,491 | 481,439 | 396,091   | 102,926 | 266,847   | 251,568 | 264,385 | 2,317,399 |
| 1910       | 235,504 | 301,009 | 462,337 | 394,415   | 86,262  | 260,367   | 240,328 | 274,260 | 2,254,482 |
| 1920       | 233,427 | 285,910 | 472,469 | 367,788   | 100,495 | 239,621   | 223,406 | 256,184 | 2,179,300 |

| Improved Acres in Farms |        |      |        |           |     |            |         |       |
| 1900       | 85,823  | 90,061 | 216,582 | 199,254   | 34,296  | 127,072   | 92,512  | 134,832 | 980,332  |
| 1910       | 91,663  | 103,371 | 236,033 | 211,087   | 36,011  | 137,162   | 107,919 | 136,463 | 1,059,709 |
| 1920       | 103,175 | 118,658 | 256,591 | 214,653   | 46,148  | 137,949   | 121,325 | 139,025 | 1,139,524 |

| Average Acres Per Farm |        |      |        |           |     |            |         |       |
| 1900       | 272.4   | 116.2 | 203.3  | 143.8     | 80.7   | 215.5     | 109.3   | 178.3   | 154.8    |
| 1910       | 214.5   | 82.6  | 168.1  | 113.0     | 58.4   | 167.2     | 83.7    | 123.7   | 118.0    |
| 1920       | 176.8   | 74.5  | 155.4  | 99.9      | 55.0   | 136.1     | 72.3    | 98.8    | 103.1    |

| Improved Acres Per Farm |        |      |        |           |     |            |         |       |
| 1900       | 99.2    | 35.1  | 89.6   | 72.4      | 76.8   | 106.6     | 40.2    | 84.5    | 65.5     |
| 1910       | 83.5    | 28.4  | 85.8   | 67.5      | 24.4   | 88.1      | 37.6    | 61.5    | 55.5     |
| 1920       | 78.2    | 30.9  | 85.0   | 58.3      | 25.2   | 78.3      | 39.3    | 53.6    | 53.9     |

| Farms Operated by Owners |        |      |        |           |     |            |         |       |
| 1900       | 700     | 2,105 | 1,783  | 2,079     | 835    | 942        | 1,843   | 1,233   | 11,438   |
| 1910       | 879     | 3,106 | 2,154  | 2,919     | 1,063  | 1,193      | 2,406   | 1,772   | 15,392   |
| 1920       | 1,032   | 3,195 | 2,263  | 2,391     | 1,216  | 1,374      | 2,501   | 2,049   | 16,531   |

(Source: U.S. Census Data)
TABLE 13

Selected Items from State Census, 1865-1895

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>3,353</td>
<td>11,474</td>
<td>98,695</td>
<td>46,440</td>
<td>2,686</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>3,258</td>
<td>27,578</td>
<td>326,177</td>
<td>77,340</td>
<td>3,522</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>6,008</td>
<td>41,941</td>
<td>318,091</td>
<td>63,763</td>
<td>1,530</td>
<td>26,122</td>
</tr>
<tr>
<td>1895</td>
<td>6,292</td>
<td>75,320</td>
<td>431,550</td>
<td>121,489</td>
<td>155</td>
<td>147,600</td>
</tr>
<tr>
<td>Clackamas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>3,502</td>
<td>6,062</td>
<td>88,651</td>
<td>23,907</td>
<td>11,026</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>5,818</td>
<td>28,157</td>
<td>146,389</td>
<td>31,604</td>
<td>1,026</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>10,035</td>
<td>37,952</td>
<td>274,710</td>
<td>45,151</td>
<td>2,617</td>
<td>133,708</td>
</tr>
<tr>
<td>1895</td>
<td>21,253</td>
<td>63,527</td>
<td>203,805</td>
<td>69,685</td>
<td>1,270</td>
<td>1,317,427</td>
</tr>
<tr>
<td>Linn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>7,709</td>
<td>49,405</td>
<td>199,168</td>
<td>132,148</td>
<td>9,554</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>8,754</td>
<td>79,688</td>
<td>998,626</td>
<td>168,893</td>
<td>2,529</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>11,431</td>
<td>134,340</td>
<td>1,131,873</td>
<td>220,647</td>
<td>657</td>
<td>154,614</td>
</tr>
<tr>
<td>1895</td>
<td>18,006</td>
<td>164,586</td>
<td>926,768</td>
<td>200,456</td>
<td>110</td>
<td>759,206</td>
</tr>
<tr>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>8,371</td>
<td>45,610</td>
<td>220,186</td>
<td>102,223</td>
<td>10,395</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>12,237</td>
<td>77,707</td>
<td>865,731</td>
<td>145,297</td>
<td>1,286</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>11,046</td>
<td>130,849</td>
<td>1,299,196</td>
<td>171,399</td>
<td>-</td>
<td>450,244</td>
</tr>
<tr>
<td>1895</td>
<td>30,047</td>
<td>168,799</td>
<td>599,870</td>
<td>96,669</td>
<td>2,799</td>
<td>8,087,422</td>
</tr>
<tr>
<td>Multnomah</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>6,306</td>
<td>4,051</td>
<td>2,827</td>
<td>4,999</td>
<td>270</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>15,371</td>
<td>6,665</td>
<td>6,069</td>
<td>11,177</td>
<td>95</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>35,732</td>
<td>10,813</td>
<td>10,953</td>
<td>5,210</td>
<td>165</td>
<td>-</td>
</tr>
<tr>
<td>1895</td>
<td>92,950</td>
<td>34,763</td>
<td>7,735</td>
<td>5,624</td>
<td>-</td>
<td>22,037</td>
</tr>
<tr>
<td>Polk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>4,083</td>
<td>86,127</td>
<td>119,657</td>
<td>94,128</td>
<td>3,462</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>5,063</td>
<td>74,893</td>
<td>607,402</td>
<td>80,033</td>
<td>442</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>6,316</td>
<td>90,489</td>
<td>1,042,910</td>
<td>117,524</td>
<td>505</td>
<td>-</td>
</tr>
<tr>
<td>1895</td>
<td>9,193</td>
<td>81,762</td>
<td>795,951</td>
<td>132,108</td>
<td>441</td>
<td>2,041,640</td>
</tr>
<tr>
<td>Washington</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>3,106</td>
<td>14,224</td>
<td>86,541</td>
<td>21,564</td>
<td>5,029</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>4,963</td>
<td>26,685</td>
<td>201,976</td>
<td>48,672</td>
<td>3,680</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>9,245</td>
<td>49,969</td>
<td>390,929</td>
<td>37,098</td>
<td>175</td>
<td>10,136</td>
</tr>
<tr>
<td>1895</td>
<td>15,362</td>
<td>65,286</td>
<td>267,202</td>
<td>39,642</td>
<td>-</td>
<td>525,288</td>
</tr>
<tr>
<td>Yamhill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>4,018</td>
<td>26,343</td>
<td>165,159</td>
<td>98,040</td>
<td>2,527</td>
<td>-</td>
</tr>
<tr>
<td>1875</td>
<td>5,447</td>
<td>60,152</td>
<td>565,073</td>
<td>72,949</td>
<td>2,566</td>
<td>-</td>
</tr>
<tr>
<td>1885</td>
<td>8,161</td>
<td>91,040</td>
<td>1,044,395</td>
<td>67,989</td>
<td>-</td>
<td>740,685</td>
</tr>
<tr>
<td>1895</td>
<td>14,068</td>
<td>83,138</td>
<td>846,451</td>
<td>70,741</td>
<td>600</td>
<td>1,269,515</td>
</tr>
</tbody>
</table>

(Source: Oregon Census Data)
Hop growing required the importation of farm labor both for tending the vines as well as for the massive harvesting efforts. Annually tent cities sprung up in the Willamette Valley. Eager homesteaders from Tillamook and Lincoln counties packed up their gear and horses to journey to the hopyards to earn much needed money. Indians on the Siletz and Grand Ronde reservations secured passes from the B.I.A. officials to permit them to leave the government's close supervision and work in the fields (Beckham 1977:174-75; Anonymous 1972).

Hop growing continued to be a very significant agricultural business until the 1920s. Prohibition took a terrible toll in the sale of the dried hops. Sidney Newton who worked for more than thirty years in the yards of Polk County wrote:

Hop pickers were registered in July and early August, and teamsters, wire down men, yard bosses and hop house crews were chosen. Many hop pickers came back year after year, brought their families and stayed the entire season. Pickers earned enough money for winter supplies and school clothing. These people came from every walk of life throughout Oregon and the Northwest. They arrived in Independence by train, steamboat, wagons, horseback and on foot... Pickers came to independence by the thousands (Newton 1971:66).

While hops grew in importance, Oregon's nascent tobacco industry died by the 1890s. Production which had been of minor importance in the 1860s slipped every year and by 1895 many counties reported no tobacco growing whatever (Oregon Census Data). Wheat production, however, remained a staple for sale from Oregon farms in the northern part of the Willamette Valley throughout the latter nineteenth century. In the 1880s increasing commitment was made, as well, to the production of fruit crops.

One of the most important new fruit crops for the area was prunes. Within a few years extensive orchards had been planted on the red soil of the foothills of the Coast Range, especially in Washington and Yamhill counties. Farmers hastily erected dryers to process the prunes. Some purchased patented machinery put out by the same firms which had sold their ovens and racks to apple growers. Prune production also increased the need for seasonal farm labor. Thousands of Oregonians came to the orchards to gather the fruit in late August and early September (Carlton Elementary School Bicentennial Club 1976:10).

By the 1920s dairying had become an important new agricultural commitment in western Oregon. In that year eighty-six creameries in the Willamette Valley produced over 15 million pounds of dairy commodities. But two decades before the state had possessed only 24 creameries. These plants were supplemented by condenseries which produced dried milk products. In Tillamook County the focus of agriculturists upon dairying developed in the 1890s and has persisted to the present time (Clark 1927:1279-30; Anonymous 1972).

Agriculture, while not directly affecting the lands of the Salem BLM District, became a significant magnet for drawing in the burgeoning population of western Oregon after 1843. In some instances—not well documented—cattle men and sheep herders took their herds onto public domain lands. The success of farmers in selling their commodities led to continued homesteading in the region well into the early twentieth century. In the 1890s ambitious prune-growers took up claims on poorly-watered foothill ridges in the Coast Range facing the Willamette Valley. Some of these farms failed and the lands reverted to the Public Land Office and its successor, the BLM.

Logging and Lumbering

Logging and lumbering commenced on the Willamette River at the falls at Oregon City in 1843. As early as 1828 Dr. John McLoughlin and George Simpson of the Hudson's Bay Company had selected the site as a prime water power location for a mill. The first Hudson's Bay Company mill had been located approximately five miles from Fort Vancouver in what is now Clark County, Washington. In 1828-29 the Company shipped out its first cargo of lumber which was sold in the Hawaiian Islands. Markets, however, were few and the nascent lumber industry languished for many years (Johansen 1967:133).

The influx of settlers in the 1840s and the development of townsites—Linn City, Milwaukie, Oregon City, St. Johns, Linton, and other speculative communities—along the Willamette created a new need for lumber. Steam-powered sawmills such as the Hunt operation on the Lower Columbia River were operating by 1846. The boom of California with the gold rush of 1849, however, sparked an immediate demand for Oregon's lumber. Within a few
TABLE 14
Salem BLM District Sawmills and Production, 1902

<table>
<thead>
<tr>
<th>Location</th>
<th>Company</th>
<th>Lumber</th>
<th>Shingles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argenti</td>
<td>Russell &amp; Neal</td>
<td>4,000,000</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Bacon</td>
<td>Hoffman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridal Veil</td>
<td>Bridal Veil Lumber Co.</td>
<td>15,000,000</td>
<td></td>
</tr>
<tr>
<td>Detroit</td>
<td>Wm. Y. Smith</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Eagle Creek</td>
<td>A. Y. Douglas</td>
<td>125,000</td>
<td></td>
</tr>
<tr>
<td>Eagle Creek</td>
<td>L. M. Yocum</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>Falls City</td>
<td>Bryan Lucas Lumber Co.</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td>Fairdale</td>
<td>J. Jorgensen</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>Falls City</td>
<td>Coast Range Lumber Co.</td>
<td>900,000</td>
<td></td>
</tr>
<tr>
<td>Forest Grove</td>
<td>W. H. Lyda</td>
<td>2,000,000</td>
<td></td>
</tr>
<tr>
<td>Forest Grove</td>
<td>W. M. Lyda</td>
<td>600,000</td>
<td></td>
</tr>
<tr>
<td>Forest Grove</td>
<td>Geo. Holscher</td>
<td>1,800,000</td>
<td></td>
</tr>
<tr>
<td>Gresham</td>
<td>Frank Heinig</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Hillsboro</td>
<td>J. C. Hare</td>
<td>2,600,000</td>
<td></td>
</tr>
<tr>
<td>Jefferson</td>
<td>J. A. Supperte</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Lacombe</td>
<td>Banner Hill &amp; Lumber Co.</td>
<td>450,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Liberal</td>
<td>Graves &amp; Godge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manning</td>
<td>Carstens Bros.</td>
<td>1,040,000</td>
<td></td>
</tr>
<tr>
<td>Marquam</td>
<td>Wm. Mertsen</td>
<td>800,000</td>
<td></td>
</tr>
<tr>
<td>Middleton</td>
<td>Conzelman Bros.</td>
<td>750,000</td>
<td></td>
</tr>
<tr>
<td>Middleton</td>
<td>John Nelson</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Mill City</td>
<td>Curtiss Lumber Co.</td>
<td>18,100,000</td>
<td>2,345,000</td>
</tr>
<tr>
<td>Mountaingale</td>
<td>W. F. Hullenbeck</td>
<td>800,000</td>
<td></td>
</tr>
<tr>
<td>Neeley</td>
<td>J. S. Yoder</td>
<td>811,200</td>
<td></td>
</tr>
<tr>
<td>Newberg</td>
<td>Chas. K. Spaulding</td>
<td>300,050</td>
<td></td>
</tr>
<tr>
<td>Oregon City</td>
<td>B. F. Linn</td>
<td>800,000</td>
<td></td>
</tr>
<tr>
<td>Pedee</td>
<td>Pedee Lumber Co.</td>
<td>700,000</td>
<td></td>
</tr>
<tr>
<td>Philomath</td>
<td>Green Bros.</td>
<td>8,000</td>
<td></td>
</tr>
<tr>
<td>Philomath</td>
<td>J. L. Henckle</td>
<td>220,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Portland Mills [all in city]</td>
<td>360,000,000</td>
<td></td>
</tr>
<tr>
<td>Salem</td>
<td>Capital Lumbering Co.</td>
<td>5,081,146</td>
<td></td>
</tr>
<tr>
<td>Sandy</td>
<td>John H. Werner</td>
<td>700,000</td>
<td></td>
</tr>
<tr>
<td>Scholls</td>
<td>Groner &amp; Rowlid Co.</td>
<td>350,000</td>
<td></td>
</tr>
<tr>
<td>Sheridan</td>
<td>Daniels &amp; Agee</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Tillamook</td>
<td>Yellow Fir Lumber Co.</td>
<td>1,680,000</td>
<td></td>
</tr>
<tr>
<td>Tualatin</td>
<td>George Samm</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Union Mills</td>
<td>Trullinger Bros.</td>
<td>530,000</td>
<td></td>
</tr>
<tr>
<td>Waterloo</td>
<td>J. M. Wiley</td>
<td>730,000</td>
<td></td>
</tr>
<tr>
<td>Wilholt</td>
<td>A. N. Rich</td>
<td>400,000</td>
<td></td>
</tr>
</tbody>
</table>

Short years several mills were constructed in the region, especially along the Oregon Coast, the Columbia estuary, and in western Washington (Beckham 1971).

Sawmills in the vicinity of the Willamette Falls and the lower part of the Willamette Valley did not emerge until the late 1830s. In 1836 Ewing Young and Sidney Smith erected a water-powered sawmill at the mouth of Chehalam Creek near present Newberg. McLoughlin's long-planned sawmill for Oregon City was not completed until 1843. By 1844 Thomas McKay had erected a sawmill and grist mill near Champoej, a plant appraised at being worth $5,500 in 1850. Probably in 1847 McKay also erected another manufacturing plant at Butte Creek at what is now known as Scott’s Mills (Nussey 1967:88, 99, 109).

During the years 1860-70 several small sawmills were erected at water power sites on the margins of the Willamette Valley. Safe from the disastrous freshets which swept along the banks of the main river, these locations, while remote from the growing towns, were close to fine stands of timber and, above all, tapped swift flowing streams at the points where they poured out onto the broad Willamette Valley. Among the manufacturing plants was the Lee Mill at Lee Falls on the Tualatin River west of Cherry Grove, Buell’s Mill on Mill Creek south of Sheridan, Nesham’s Mill on Rickreall Creek, and Keyes’ Mill on the South Santiam. Each of these sawmills was operating by 1851 (Gibbs and Starling 1851; Beckham 1975).

In the nineteenth century many of the manufacturing sites included both sawmill and grist mill facilities. In 1850 the mills of Oregon Territory, including some along the
Figure 10. The loggers of the Bridal Veil Lumber Company resided in the small logging camp of Palmer in the Columbia Gorge in the 1880's and the 1890's. (Oregon Historical Society Photo)
Figure 11. The Bridal Veil Lumber Company in the 1880's began extensive use of locomotives and flumes for transporting logs from the slopes of the Cascades to the banks of the Columbia River. (Oregon Historical Society Photo)
Lower Columbia, produced an estimated $2.3 million in products; twenty years later the mills of just the Willamette Valley had an annual sale of $23 million. In 1880 the sales amounted to $39.5 million (Clark 1927:11456). The pace of timber cutting, manufacturing, and sales quickened in the later nineteenth century with the development of railroads to transport the logs and lumber. Further, steam technology speeded up not only sawmill operations but also enabled loggers to use steam donkey engines to yard the logs in the woods and employ steam tugs to tow the rafts down the Willamette River to the larger mills in the Oregon City-Portland area (Corning 1973).

To many of the region's nineteenth century residents the stands of virgin forest were a curse or a blight. They covered the soil which, in their estimations, should be cleared for farming or stock-raising. Herbert O. Lang, author of *History of the Willamette Valley* (1885), counseled his fellow Oregonians to reassess their thinking:

### TABLE 15
Salem BLM District Sawmills and Production, 1906

<table>
<thead>
<tr>
<th>Location</th>
<th>Company</th>
<th>Lumber</th>
<th>Shingles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baca</td>
<td>Peter Hoffman</td>
<td>1,600,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Oregon City</td>
<td>W. F. Harris</td>
<td>20,003,974</td>
<td></td>
</tr>
<tr>
<td>Brooks</td>
<td>Jas. Petzel</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Carlton</td>
<td>Smith Lumber Co.</td>
<td>1,250,000</td>
<td></td>
</tr>
<tr>
<td>Cornelius</td>
<td>Thompson Bros.</td>
<td>2,050,000</td>
<td></td>
</tr>
<tr>
<td>Corvallis</td>
<td>Benton Co. Lumber Co.</td>
<td>4,000,000</td>
<td></td>
</tr>
<tr>
<td>Dallas</td>
<td>Corvallis Mill Co.</td>
<td>5,500,000</td>
<td></td>
</tr>
<tr>
<td>Estacada</td>
<td>Willamette Valley Lumber Co.</td>
<td>13,000,000</td>
<td></td>
</tr>
<tr>
<td>Falls City</td>
<td>Falls City Lumber Co.</td>
<td>17,192,000</td>
<td></td>
</tr>
<tr>
<td>Forest Grove</td>
<td>W. H. Lyda</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Glencoe</td>
<td>Bishop Bros.</td>
<td>600,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Gresham</td>
<td>J. H. Hamblin &amp; Son</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hobsonville</td>
<td>Rodlund Bros.</td>
<td>912,000</td>
<td></td>
</tr>
<tr>
<td>Hoskins</td>
<td>Miami Lumber Co.</td>
<td>7,000,000</td>
<td></td>
</tr>
<tr>
<td>Hubbard</td>
<td>C. A. Frantt</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Hubbard</td>
<td>Chas. K. Spaulding Lumber Co.</td>
<td>1,500,000</td>
<td></td>
</tr>
<tr>
<td>Lacombe</td>
<td>Banner Mill &amp; Lumber Co.</td>
<td>600,000</td>
<td></td>
</tr>
<tr>
<td>Linnton</td>
<td>Clark &amp; Wilson Lumber</td>
<td>36,956,107</td>
<td></td>
</tr>
<tr>
<td>Lyons</td>
<td>Lyons Lumber Co.</td>
<td>2,000,000</td>
<td></td>
</tr>
<tr>
<td>Manning</td>
<td>Carstens Bros.</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Newberg</td>
<td>Charles K. Spaulding Lumber Co.</td>
<td>15,600,000</td>
<td></td>
</tr>
<tr>
<td>Oregon City</td>
<td>B. F. Linn</td>
<td>1,025,000</td>
<td></td>
</tr>
<tr>
<td>Oregon City</td>
<td>M. Pollock</td>
<td>75,000</td>
<td></td>
</tr>
<tr>
<td>Pedee</td>
<td>Pedee Lumber Co.</td>
<td>625,000</td>
<td>18,500,000</td>
</tr>
<tr>
<td>Portland</td>
<td>Chambers Shingle Co.</td>
<td>102,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Eastern &amp; Western L.</td>
<td>146,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Multnomah Lumber &amp; Box</td>
<td>12,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>North Pacific Lumber</td>
<td>85,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Jones Lumber Co.</td>
<td>15,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Oregon-Wash. Lumber</td>
<td>14,011,623</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Peninsula Lumber Co.</td>
<td>64,471,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Standard Box &amp; Lumber</td>
<td>35,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Oregon Furniture Co.</td>
<td>6,500,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Portland Lumber Co.</td>
<td>110,000,000</td>
<td></td>
</tr>
<tr>
<td>St. Johns</td>
<td>St. Johns Lumber Co.</td>
<td>10,500,000</td>
<td></td>
</tr>
<tr>
<td>Scholls</td>
<td>Groner &amp; Rowell</td>
<td>1,250,000</td>
<td></td>
</tr>
<tr>
<td>Sherwood</td>
<td>Conzelman Bros.</td>
<td>1,020,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>Bürger Bros.</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>Hartman &amp; Scheidler</td>
<td>900,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>John G. Lafe</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>Silverton Lumber Co.</td>
<td>896,000</td>
<td></td>
</tr>
<tr>
<td>Sellwood</td>
<td>East Side Mill &amp; Lumber</td>
<td>20,000,000</td>
<td></td>
</tr>
<tr>
<td>Tillamook</td>
<td>F. Long</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Waterloo</td>
<td>E. P. Hurst</td>
<td>400,000</td>
<td></td>
</tr>
<tr>
<td>Willamina</td>
<td>John Shatterly</td>
<td>600,000</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 16
Salem BLM District Sawmills and Production, 1910

<table>
<thead>
<tr>
<th>Location</th>
<th>Company</th>
<th>Lumber</th>
<th>Shingles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridal Veil</td>
<td>Bridal Veil Lumber</td>
<td>20,806,433</td>
<td></td>
</tr>
<tr>
<td>Bull Run</td>
<td>Troutdale Lumber Co.</td>
<td>7,400,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Inman-Poulsen Lumber Co.</td>
<td>135,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Portland Lumber Co.</td>
<td>90,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Eastern &amp; Western Lumber</td>
<td>86,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>North Pacific Lumber</td>
<td>45,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Peninsula Lumber Co.</td>
<td>64,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Standard Box &amp; Lumber</td>
<td>44,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Multnomah Lumber &amp; Box</td>
<td>16,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Jones Lumber Co.</td>
<td>11,500,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Oregon &amp; Washington Lumber Co.</td>
<td>6,500,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>West Side Lumber &amp; Shingle Co.</td>
<td>18,750,000</td>
<td>24,000,000</td>
</tr>
<tr>
<td>Portland</td>
<td>Oregon Furnish Mfg.</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Pacific Lumber &amp; Mfg.</td>
<td>5,300,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>East Side Mill &amp; Lumber</td>
<td>35,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>St. Johns Lumber Co.</td>
<td>52,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Clark &amp; Wilson Lumber Co.</td>
<td>33,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Monarch Lumber Co.</td>
<td>40,825,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>West Oregon Lumber Co.</td>
<td>10,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Burlington Lumber Co.</td>
<td>2,500,000</td>
<td></td>
</tr>
</tbody>
</table>

Every timber tree, suited by its species and size to produce lumber, is worth saving. It has been, and still is, the custom to cut down and burn them, without regard to their increased value. Of course the idea of clearing lands is incompatible with that of preserving the forests, but in many cases the best trees might be left, while the worthless underbrush—generally abundant in these woods—is cleared out. It happens, however, that the aggregate damage, resulting from the operations of lumbermen and the intentioned destruction wrought by farmers, is nothing in comparison to the loss from general forest fires on vacant land (Lang 1885:527).

By the 1860s an increasing number of Oregonians were ready to agree with Lang, especially those who had emigrated to the region with capital to invest in the timberlands of the Coast Range and the lower slopes of the Cascades. This new generation of lumbermen, many of whom were experienced in the business in Wisconsin, Minnesota, or Missouri, came to the Pacific Northwest because of the vast stands of timber. They saw the potential in using steam technology, local labor, and their energies to market Oregon lumber on a vast scale. With determination and considerable success they revolutionized the region’s lumber industry. From relatively small, locally-owned plants staffed by a half dozen or fewer men, they built vast sawmills and put into the field hundreds of loggers. Between 1890 and 1910 the pace of “commercial” logging and lumbering in the Pacific Northwest increased markedly (Cox 1944).

The annual production figures for the mills of the lower or northern Willamette Valley and its surrounding foothills clearly illustrate that between 1900 and 1920 the region dominated Oregon’s lumber economy. Several major corporations worked in the region and led in production. In the Clackamas Planning Unit was the Bridal Veil Lumber Company with both logging and mill operations. Several of the Portland-based sawmills, especially the Eastern and Western Lumber Company and the Inman-Poulsen Company secured their timber from the Clackamas Unit. In the Columbia Unit the Hoffman Shingle Company at Bacon conducted production year after year. The Carlton Lumber Company at Carlton and the Charles K. Spaulding operations at Newberg tapped timber in the Yamhill Unit. Spaulding also owned mills in Independence and Salem. The Falls City Lumber Company for many years worked the timber on the Luckiamute River. Similarly the Silver Falls Lumber Company worked the region east of Silverton (see Tables 14-18) (Anonymous 1903, 1907, 1911, 1915, 1919; Carlton Elementary School Bicentennial Club 1976).

Throughout this period in the early twentieth century the Portland-based sawmills dominated all cutting and manufacturing in the Salem BLM District and in Oregon as well. In 1900 the mills of Portland manufactured 368,000,000 board feet of lumber. This figure grew to 590,000,000 board feet in 1906 and 700,000,000 board feet in 1910. In 1914 production had fallen to 440,000,000 board feet. In spite of this drop-off, Portland’s large manufacturing plants were not languishing. Along with some of the strong small town operations in Falls City, Silverton, Carlton, Bridal Veil, and Corvallis they were leading in this vital part of Oregon’s economy (Anonymous 1903, 1907, 1911, 1915, 1919).

The advent of logging and lumbering as a key part of the economy of the Salem BLM District meant that increasingly numbers of residents of the region found employment in these undertakings. Throughout most of the period down to the 1920s, logging was a sea-
TABLE 17
Salem BLM District Sawmills and Production, 1914

<table>
<thead>
<tr>
<th>Location</th>
<th>Company</th>
<th>Lumber</th>
<th>Shingles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>Albany Hardware &amp; Lumber Co.</td>
<td>2,000,000</td>
<td></td>
</tr>
<tr>
<td>Banks</td>
<td>C. Spiering</td>
<td>620,000</td>
<td></td>
</tr>
<tr>
<td>Boring</td>
<td>Jonsrud Bros.</td>
<td>250,000</td>
<td>704,800</td>
</tr>
<tr>
<td>Brooks</td>
<td>A. M. Bolter</td>
<td></td>
<td>30,000</td>
</tr>
<tr>
<td>Bacona</td>
<td>Peter Hoffman</td>
<td></td>
<td>500,000</td>
</tr>
<tr>
<td>Bridal Veil</td>
<td>Bridal Veil Lumber Co.</td>
<td>26,301,920</td>
<td></td>
</tr>
<tr>
<td>Colton</td>
<td>Hult Bros.</td>
<td>2,000,000</td>
<td>458,000</td>
</tr>
<tr>
<td>Estacada</td>
<td>A. Kreiger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estacada</td>
<td>Garfield Lumber Co.</td>
<td>350,000</td>
<td></td>
</tr>
<tr>
<td>Falls City</td>
<td>Falls City Lumber Co.</td>
<td>20,000,000</td>
<td></td>
</tr>
<tr>
<td>Gooden</td>
<td>C. J. Clement</td>
<td>700,000</td>
<td></td>
</tr>
<tr>
<td>Gaston</td>
<td>Fish Bros.</td>
<td>800,000</td>
<td></td>
</tr>
<tr>
<td>Gaston</td>
<td>C. Thayer</td>
<td>175,000</td>
<td></td>
</tr>
<tr>
<td>Jefferson</td>
<td>Jefferson Mill Co.</td>
<td>10,200,000</td>
<td></td>
</tr>
<tr>
<td>Kings Valley</td>
<td>Kings Valley Lumber</td>
<td>600,000</td>
<td></td>
</tr>
<tr>
<td>Linnton</td>
<td>Clark &amp; Wilson L. Co.</td>
<td>43,616,915</td>
<td></td>
</tr>
<tr>
<td>Linnton</td>
<td>West Oregon L. Co.</td>
<td>34,000,000</td>
<td></td>
</tr>
<tr>
<td>Mill City</td>
<td>Hammond Lumber Co.</td>
<td>23,150,000</td>
<td></td>
</tr>
<tr>
<td>Mulino</td>
<td>Hult Lumber Co.</td>
<td>1,755,000</td>
<td>750,000</td>
</tr>
<tr>
<td>Manning</td>
<td>McFarlane Bros.</td>
<td>1,665,794</td>
<td></td>
</tr>
<tr>
<td>Manning</td>
<td>Hunger Bros. L. Co.</td>
<td></td>
<td>500,000</td>
</tr>
<tr>
<td>Newberg</td>
<td>C. K. Spaulding L. Co.</td>
<td>14,227,054</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>East Side Mill &amp; L. Co.</td>
<td>30,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>North Pacific L. Co.</td>
<td>43,030,643</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>East &amp; West L. Co.</td>
<td>61,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>L. S. Memreeke L. Co.</td>
<td></td>
<td>193,000,000</td>
</tr>
<tr>
<td>Portland</td>
<td>S. Ban Shingle Co.</td>
<td>861,953</td>
<td>5,641,000</td>
</tr>
<tr>
<td>Portland</td>
<td>Jones Lumber Co.</td>
<td>12,009,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Hime-Poulsen L. Co.</td>
<td>127,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Portland Lumber Co.</td>
<td>67,500,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Howell Shingle Co.</td>
<td>26,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Peninsula Lumber Co.</td>
<td>34,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Multnomah L. &amp; Box Co.</td>
<td>35,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Standard B. &amp; L. Co.</td>
<td>29,950,971</td>
<td></td>
</tr>
<tr>
<td>Sandy</td>
<td>Sandy Ridge Lumber Co.</td>
<td>510,000</td>
<td></td>
</tr>
<tr>
<td>Salem</td>
<td>Chas. S. Spaulding L.</td>
<td>19,649,981</td>
<td></td>
</tr>
<tr>
<td>Scotts Mills</td>
<td>Giger Bros.</td>
<td>600,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>John H. Brewer</td>
<td>550,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>Silverton Lumber Co.</td>
<td>25,000,000</td>
<td></td>
</tr>
<tr>
<td>St. Johns</td>
<td>St. Johns Lumber Co.</td>
<td>36,500,000</td>
<td></td>
</tr>
<tr>
<td>Tillamook</td>
<td>Long &amp; Co.</td>
<td>1,040,000</td>
<td></td>
</tr>
<tr>
<td>Tualatin</td>
<td>Tualatin Mill Co.</td>
<td>865,000</td>
<td></td>
</tr>
<tr>
<td>Yamhill</td>
<td>Reliance Lumber Co.</td>
<td>2,000,000</td>
<td></td>
</tr>
</tbody>
</table>

sonal venture. The winter rains and mud made logging by horse team, ox team, and even the steam donkeys virtually impossible. Not until trucks powered by internal combustion engines were available did extensive year-round logging occur (Andrews 1957). Sawmill operations, however, were less dependent upon the vagaries of weather. The woodsmen and sawdust of Portland, Silverton, Carlton, and—for a time-Cherry Grove—became familiar to all residents of the area. Many a young man left the farm to seek his income as a logger or mill worker. The rough-and-tumble life of the logging camps or the siren call of the mill whistle appealed to those who preferred the ax or the saw to the rhythmic sounds of milk falling into a pail at five o'clock in the morning.

Important alterations occurred in the sources of logs for the mills of the Salem BLM District. Initially the Lower Columbia River and its back country, especially Columbia and Clatsop counties in Oregon, provided the logs for manufacturing lumber. With the exhausting of those resources, mill owners turned next to the Columbia Gorge, the Clackamas country, and distant Tillamook County. The vast timbers of the Tillamook Bay watershed fell readily into the manufacturing energies of the Willamette Valley and Portland because of the building of the railroad into the coastal region early in the twentieth century. Eventually those areas also were largely logged off, or, in the case of Tillamook County, burned out in the great fire of 1933 (Cornwall 1941:11).

By the 1940s yet another shift in timber harvest had occurred for the mills of the Salem District. In that decade the manufacturers turned increasingly to the upper Willamette watershed. By 1941, George F. Cornwall wrote:
TABLE 18
Salem BLM District Sawmills and Production, 1918

<table>
<thead>
<tr>
<th>Location</th>
<th>Company</th>
<th>Lumber</th>
<th>Shingles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacona</td>
<td>P. Hoffman</td>
<td>340,000</td>
<td></td>
</tr>
<tr>
<td>Banks</td>
<td>Spiering &amp; Shaler</td>
<td>850,000</td>
<td></td>
</tr>
<tr>
<td>Corvallis</td>
<td>Willamette Valley Stock &amp; Land Co.</td>
<td>2,650,000</td>
<td></td>
</tr>
<tr>
<td>Gaston</td>
<td>Oscar Raines</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Gooch</td>
<td>Gooch Lumber &amp; Shingle</td>
<td>7,490,461</td>
<td></td>
</tr>
<tr>
<td>Hillsboro</td>
<td>Groner &amp; Rowell Co.</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Hillsboro</td>
<td>G.H.P. Lumber Co.</td>
<td>4,000,006</td>
<td></td>
</tr>
<tr>
<td>Jefferson</td>
<td>Jefferson Mill Co.</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>Kings Valley</td>
<td>Kings Valley Lumber Co.</td>
<td>1,291,812</td>
<td></td>
</tr>
<tr>
<td>Linton</td>
<td>Oregon Ship Timber Mills</td>
<td>17,000,000</td>
<td></td>
</tr>
<tr>
<td>Linton</td>
<td>West Oregon Lumber Co.</td>
<td>30,000,000</td>
<td></td>
</tr>
<tr>
<td>Mill City</td>
<td>Hammond Lumber Co.</td>
<td>48,391,024</td>
<td></td>
</tr>
<tr>
<td>Mill City</td>
<td>Hill &amp; Craner</td>
<td>10,000,000</td>
<td></td>
</tr>
<tr>
<td>Mulino</td>
<td>Hult Lumber Co.</td>
<td>1,650,692</td>
<td></td>
</tr>
<tr>
<td>North Portland</td>
<td>Lester W. David</td>
<td>15,000,000</td>
<td></td>
</tr>
<tr>
<td>North Portland</td>
<td>North Portland Box Co.</td>
<td>11,665,905</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Eastern &amp; Western Lumber</td>
<td>80,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>L. B. Menefee Lumber Co.</td>
<td>18,000,000</td>
<td>153,000,000</td>
</tr>
<tr>
<td>Portland</td>
<td>Northern Pacific L. Co.</td>
<td>50,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Multnomah Lumber &amp; Box</td>
<td>33,200,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Portland Lumber Co.</td>
<td>57,000,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Rice-Kinder Lumber Co.</td>
<td>6,600,000</td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td>Standard Box &amp; Lumber</td>
<td>19,900,000</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Scotts Mills</td>
<td>Giger Bros.</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Sherridan</td>
<td>Ryan-Allen L. Co.</td>
<td>8,250,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>John H. Brewer</td>
<td>650,000</td>
<td></td>
</tr>
<tr>
<td>Silverton</td>
<td>Silverton Lumber Co.</td>
<td>23,400,000</td>
<td></td>
</tr>
<tr>
<td>Tillamook</td>
<td>A. F. Coats Lumber Co.</td>
<td>13,398,731</td>
<td></td>
</tr>
<tr>
<td>Willamina</td>
<td>Chas. F. Anderson</td>
<td>500,000</td>
<td></td>
</tr>
</tbody>
</table>

Logging concerns using the upper Willamette River as a part of their log transportation scheme, range from small, one-sided camps with a bit of light equipment and a few trucks to companies producing as much as 600,000 feet a day with large fleets of company-owned and leased trucks. Hauls to the dumps on the Willamette and the Yamhill rivers vary from 30 to 60 miles or over (Cornwell 1941:11).

A measure of the shift to the timber above the falls of the Willamette was evident in the phenomenal increase in the passage of logs through the locks at Oregon City between 1938 and 1941. In the former year a total of 21,000,000 feet used the locks; this grew in 1939 to 140,000,000 feet and by 1941 nearly 520,000,000 feet (Cornwell 1941:13).

The 1940s were the last boom years, however, for Willamette Valley lumbering. The massive cutting of the nineteenth century and the intensive exploitation of timber resources in the Salem BLM District led to a marked tapering off of lumber manufacturing in the mid-1950s. While Portland had led in production for decades, the city soon lost out to towns farther south in the valley. Lebanon, Sweet Home, Eugene, and Springfield took on increased significance in lumber cutting. Mill towns such as McMinnville scrambled to find new industries to replace the abandoned sawmill sites. While logging and lumbering remained part of the economy of the region, its primary importance had been eclipsed by the shift of timber harvest to other areas.

**Mining**

Although mining has not played any significant role in the development of the economy of the Salem BLM District, two small mining areas are located near BLM lands in the Western Cascades. The first of these, known as the Quartzville District, lies in Linn County in T11-12S, R4E in what is now the Willamette National Forest. The second is the North Santiam District which is located in T8S, R4-5E; T7S, R4E; T9S, R5-6E.

The Quartzville mines were discovered in 1863. Eventually the miners organized a district, but in spite of the development of the Lawler and Albany mines in the 1890s, production has remained very limited. In 1951 the total output was estimated for the district to be $181,285. This included 8,557 ounces of gold and 2,920 ounces of silver (Brooks and
Ramp 1968:282). The North Santiam mines were discovered about 1877. In the years 1896-1947 production amounted to about $25,000 (Brooks and Ramp 1968:286).

Tourism

Like other Americans in the nineteenth century, Oregonians had grasped the allurements of the "picturesque and the sublime." Paved by the enchantment of bucolic places, especially forested groves, waterfalls, and craggy mountain peaks; recreation seekers left their urban haunts to seek rejuvenation as one newspaper writer put it "ruralizing among the rustics." The fascination of residents of the region with the countryside was revealed, for example, in Frances Fuller Victor's poem "Folk County Hills" which was published in 1877:

November came that day,
And all the air was gray
With delicate mists, blown down
From hill-tops by the south wind's balmy breath;
And all the oaks were brown
As Egypt's kings in death;
And maple's crown of gold
Laid tarnished on the wold:
The elder and the ash, the aspen and the willow,
Were tattered suits of yellow (Victor 1877:310).

By 1891, after a dozen years of assisting the historian Hubert Bancroft write his various histories of the Pacific Northwest, Frances Victor returned to Oregon to tout the rural attractions of the state. In Atlantic Monthly she reviewed mountain climbing, trips to the shores of the Pacific, the communities of the Willamette Valley, and many other attractions for the traveler. Representative of her prose treatment of the region was her comment on Tillamook County. Mrs. Victor found that it was a region "that would delight the hearts of poets and painters" and that "its streams and rivers, its roads and its dales, its valleys, glens, and ravines are given over to the empire of loneliness" (Victor 1891:118).

Many Oregonians concurred in this popular regional writer's assessment of the attractions of the Oregon countryside. Especially appealing to the early tourists--those of the late nineteenth century--were the mineral springs and spas. For Germans or Scandinavians the "baths" and "waters" were familiar tourist retreats of the Old World. In Oregon they might take in the delights of Bagby, Belknap, Breitenbush, McCreath, or Austin hot springs in the western Cascades. At Wilhoit Springs, ten miles southeast of Molalla in Clackamas County, as early as 1871 they could visit A. F. McIver's bottling plant which had tapped the local waters. By 1890s the site had a dance hall, bowling alley, cabins, and daily stage service. Wilhoit Springs continued as an important resort until the 1920s (Horowitz 1973:37-39).

In the Yamhill region the Fairdale Mineral Springs was a popular stopping place in the 1880s and following for travelers using the stage road through the Coast mountains to the Trask house and Tillamook. The springs remained popular until just prior to World War I. In the Santiam region Sodaville, Cascadia, and Waterloo drew thousands of visitors over the years. George W. Guisendorfer in 1895 erected at Cascadia a thirty room hotel and bath house. By the 1920s his site included a post office, grocery, ball park, and fifteen summer cottages. Sodaville even became a college town in 1892 with the construction of Mineral Springs Seminary, later known as Mineral Springs College. Although the institution failed in 1902, the site later became Oregon's first state park (Horowitz 1973:41-64).

Much of the developing tourism of the early twentieth century in Oregon was inextricably related to the "Good Roads Movement." Sparked by boosters and urban dwellers fascinated with the potential of the automobile, the construction of highways helped to increase the amount of tourism significantly. Between 1913 and 1915, for example, leading businessmen in Portland were successful in securing private donations, county, and state funds for building the Columbia Gorge Highway. Designed by Samuel Lancaster, an engineer who grasped the stunning beauty of the passage of the Columbia through the Cascades, this first, major paved road in the state became a phenomenal success. Within a few years thousands of tourists were passing over the gentle turns of the Gorge Highway to see the sights of Bridal Veil, Crown Point, and Multnomah Falls (Fahl 1973).
In the 1930s the federal government created simple and appealing facilities on many federal lands in the western Cascades which drew tourists as well. Although most of these improvements were on lands administered by the U.S. Forest Service, they brought people through the lands of the Salem BLM District. In the Mount Hood and Willamette National Forests the C.C.C. and W.P.A. spent tens of thousands of hours building trails for hikers, campgrounds, and picnic areas. At Mount Hood the W.P.A. erected colossal Timberline Lodge while the C.C.C. created the extensive facilities at Silver Falls Park east of Silverton (Vaughan and Ferriday 1974:529-39).

Elisabeth Walton Potter, historian with the Oregon State Parks, has assessed the development of tourism in rural areas in Oregon in the first half of the twentieth century:

The decades between 1920 and 1950 brought an unprecedented demand for recreation resorts throughout the region and, inevitably, a demand for improved roads to the more remote among them. The automobile and seemingly boundless fuel supplies made leisure travel possible for nearly everyone. Proliferation of auto camps and cabins gave motorists a choice between them and the most economical facilities. New types, such as motels and drive-in cafes, evolved to accommodate the motor car. In the Northwest, as elsewhere, construction of lodges and resort hotels in public holdings during the Depression provided an outlet for thousands of skilled and unskilled laborers, and craftsmen. The result was distinctive buildings which drew our admiration because the quality of their craftsmanship is out of reach today in economic terms. The best resort architecture of the period was designed with a scientific as well as esthetic approach to site planning in the natural setting, which helped point the way to broader environmental awareness of the future (Vaughan and Ferriday 1974:530-41).

Transportation

The Willamette River became the lifeline of transportation in the Salem BLM District as early as the 1850s. For the Indians, of course, its somewhat sluggish waters above the falls at Oregon City had long been used for transporting their canoes or rafts laden with camas, acorns, deer, or elk. Within a short period in the early 1850s the riverboat operators had discerned the potential for steamboat shipping on the Willamette from the Falls to as far up the valley as Harrisburg. The depth of the river meant that regular traffic could easily reach Corvallis. For nearly sixty years--until the intense competition of truck traffic during World War I--the river boats held their own in the region (Corning 1973).

The burgeoning agricultural produce of the Willamette Valley, especially wheat in the nineteenth century, made river transportation attractive. Important, however, were the improvements to navigation that included the locks at Oregon City, completed in 1877, and the locks on the Yamhill near Lafayette, opened in 1900. The locks not only ended the portage of tons of commodities, they opened the vast Willamette watershed for relatively easy log transportation. Winter freshets were employed to drive the logs down the Molalla, Clackamas, Tualatin, Luckiamute, or Mary's River. Once the rafts were assembled, tug pulled the timber down the Willamette or Yamhill, through the locks and to the mills. Many of the major manufacturing facilities of Portland benefitted immensely by these improvements (Corning 1973:63-66, 187-88).

Railroads also helped shape the course of the economy of the Salem BLM District. At first the use of rails involved mule or horse-drawn cars pulling small cargoes on tracks at difficult portages in the Columbia Gorge or at the Willamette Falls. In 1869, however, John Ainsworth, Simon Reed, Robert R. Thompson, and P. F. Bradford formed the Oregon Steam Navigation Company and built a fourteen mile railroad at the Cascades of the Columbia (Gaston 1912:1:506).

Although many railroad companies subscribed stock and occasionally sent surveyors into the field to locate routes through the Willamette Valley to California, none succeeded in securing sufficient capital until the 1870s to become a serious factor in altering the region's transportation system. In that decade two railroads--the Oregon Centrals (one east of the Willamette and the other west of the river)--began a fervid competition to build up the valley. The stimulus to the firms was the Congressional grant of 5,000,000 acres of public domain to the Oregon legislature to pass on to the company which it designated. The land encompassed the watersheds of the Willamette, Umpqua, and Rogue valleys and included vast stands of virgin timber (Johansen 1967:309).
Eventually the company building on the east side of the Willamette succeeded in gaining the grant and quickly passed into the control of Ben Holladay. His Oregon and California Railroad, beneficiary of the generous Congressional grant, reached Salem in September, 1870, and Roseburg in 1872. Then the line languished and for a decade no more tracks were laid. Finally in 1887 the Southern Pacific Company linked the line to the railroads of California (Gaston 1912:1:522-24).

The main line through the Willamette Valley was soon supplemented by a series of feeder railroads. In 1876 Joseph Gaston led the way by completing 48 miles of narrow gauge track from Dayton to Sheridan in the valley of the Yamhill River. Eventually this line was extended south to Dallas and into the foothills of the Coast Mountains at Airlie in Benton County. In 1880 William Reid built a line from Dundee on the west side of the Willamette to Ray's Landing, crossed the river, and continued the railroad to Woodburn, Silverton, Scio, and Coburg. T. Egerton Hogg helped raise the money for the Corvallis & Alsea line which ran from the headquarters of his farm in Corvallis to Monroe. Corvallis and Eastern extended from Yaquina Bay on the coast into the Cascade foothills of the Santiam watershed (Gaston 1912:1:533-38).

These lines were supplemented by private logging railroads constructed by many different timber companies early in the twentieth century. The largest of these logging railroads, several of which crossed or tapped BLM timberlands, were the following.

**TABLE 19**

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Mileage</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridal Veil Lumber Co.</td>
<td>Palmer</td>
<td>16</td>
<td>1898-1941</td>
</tr>
<tr>
<td>Gordon Creek &amp; Palmer R.R.</td>
<td>Palmer</td>
<td>4</td>
<td>1924-</td>
</tr>
<tr>
<td>Carlton &amp; Coast R.R.</td>
<td>Carlton</td>
<td>30</td>
<td>1913-1939</td>
</tr>
<tr>
<td>(Flora Logging Co.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Carlton Consolidated L. Co.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carlton &amp; Washington R.R.</td>
<td>Carlton</td>
<td>16</td>
<td>1911-1913</td>
</tr>
<tr>
<td>Clark &amp; Wilson L. Co.</td>
<td>Linton</td>
<td>98</td>
<td>1905-1943</td>
</tr>
<tr>
<td>Clackamas Eastern R.R. Co.</td>
<td>Clackamas</td>
<td>19</td>
<td>1929-1940</td>
</tr>
<tr>
<td>Portland Southern Ry. Co.</td>
<td>Clackamas</td>
<td>14</td>
<td>1929-1929</td>
</tr>
<tr>
<td>Dallas &amp; Ellendale R.R.</td>
<td>Dallas</td>
<td>5</td>
<td>1901-</td>
</tr>
<tr>
<td>Eastern &amp; Western L. Co.</td>
<td>Molalla</td>
<td>30</td>
<td>1927-1935</td>
</tr>
<tr>
<td>Falls City L &amp; L Co.</td>
<td>Falls City</td>
<td>6</td>
<td>1906-1919</td>
</tr>
<tr>
<td>Foster Mills, Inc.</td>
<td>Willamina</td>
<td>7</td>
<td>1925-1931</td>
</tr>
<tr>
<td>Haskell-Carpenter Co.</td>
<td>Cherry Grove</td>
<td>6</td>
<td>1915-1928</td>
</tr>
<tr>
<td>Inman-Poulsen L. Co.</td>
<td>Keasey</td>
<td>8</td>
<td>1923-1930</td>
</tr>
<tr>
<td>LaBee Lg. Co.</td>
<td>Estacada</td>
<td>25</td>
<td>1926-1932</td>
</tr>
<tr>
<td>Willamina &amp; Grand Ronde R.R.</td>
<td>Grand Ronde</td>
<td>10</td>
<td>1920-1955</td>
</tr>
<tr>
<td>Mill City Mfg. Co.</td>
<td>Mill City</td>
<td>20</td>
<td>1934-1947</td>
</tr>
<tr>
<td>Hammond L. Co.</td>
<td>Mill City</td>
<td>35</td>
<td>1910-1934</td>
</tr>
<tr>
<td>Curtiss L. Co.</td>
<td>Mill City</td>
<td>10</td>
<td>1905-1941</td>
</tr>
<tr>
<td>Portland &amp; Southwestern R.R.</td>
<td>Linton</td>
<td>20</td>
<td>1905-1943</td>
</tr>
<tr>
<td>(Clark &amp; Wilson L. Co.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Nehalem T. &amp; Lg. Co.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Chapman T. Co.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver Falls T. Co.</td>
<td>Silverton</td>
<td>68</td>
<td>1912-1938</td>
</tr>
<tr>
<td>Silverton L. Co.</td>
<td>Silverton</td>
<td>12</td>
<td>1906-1931</td>
</tr>
<tr>
<td>Chas. K. Spaulding L. Co.</td>
<td>Newberg</td>
<td>20</td>
<td>1906-1938</td>
</tr>
<tr>
<td>Spaulding-Hamilton L. Co.</td>
<td>Grand Ronde</td>
<td>21</td>
<td>1921-1924</td>
</tr>
<tr>
<td>Marys River Lg. Co.</td>
<td>Philomath</td>
<td>11</td>
<td>1916-1926</td>
</tr>
<tr>
<td>Stimson Lumber Co.</td>
<td>Forest Grove</td>
<td>18</td>
<td>1932-1942</td>
</tr>
<tr>
<td>Valley &amp; Slitetz R.R. Co.</td>
<td>Hoskins</td>
<td>47</td>
<td>1916-</td>
</tr>
<tr>
<td>Valsetz L. Co.</td>
<td>Valsetz</td>
<td>1</td>
<td>1947-1951</td>
</tr>
<tr>
<td>(Cobb's &amp; Mitchell)</td>
<td>Valsetz</td>
<td>20</td>
<td>1920-1942</td>
</tr>
<tr>
<td>(Slitetz L &amp; Lg. Co.)</td>
<td>Hoskins</td>
<td>4</td>
<td>1915-1920</td>
</tr>
<tr>
<td>Willamette Valley Southern R.R.</td>
<td>Oregon City</td>
<td>25</td>
<td>1915-1935</td>
</tr>
<tr>
<td>(Clackamas Southern R.R.)</td>
<td>Oregon City</td>
<td>7</td>
<td>1913-1915</td>
</tr>
</tbody>
</table>

(Source: Adams 1961)
Figure 12. Prune dryers enabled farmers to process their crops and ship them more easily to market. By 1910 Washington County had over 40 dryers. (Oregon Historical Society Photo)

Figure 13. The early locomotives of the Oregon and California Railroad provided the first steam power for hauling major cargoes by land through the Willamette Valley. (Oregon Historical Society Photo)
By World War I the competition of railroads and trucks was too much for the riverboats. Abandoned and left rotting as hulks along the shores of the Willamette, these once proud vessels had served their duty in hauling the region's passengers and commerce. The railroads had captured much of the trade and, in the case of logs and lumber, continued to play for the first four decades of the twentieth century a very significant role in the region's timber industries. Increasingly, however, the improvement of highways and the construction of heavier equipment for hauling logs (and other cagers) created competition even for the railroad lines. Ultimately during the hectic days of timber harvest in the 1940s and the 1950s, the trucks proved cheaper and a better investment than logging railroads.

**FEDERAL GOVERNMENT ACTIONS**

In many parts of the Pacific Northwest the imprint of the federal government significantly shaped the lands and the communities occupied by Americans in the historic period. In the coastal zones the U.S. Lighthouse Board erected aids to navigation; the Army Corps of Engineers constructed jetties and dredged harbors. Also along the coasts the U.S. Coast Survey charted the shoals, reefs, and rocks, while the U.S. Life Saving Service and its successor, the U.S. Coast Guard, provided assistance to mariners in distress.

Congress also left a heavy imprint on life in the Pacific Northwest through the generous grants it passed on to the states for the payment to private road companies building wagon roads or to corporations engaged in the construction of railroads. For the individual families various land laws afforded everything from pre-emption lands to homesteading opportunities. In the area of land management the federal government began to play an increasingly important role after 1900 with the creation of various national forest reserves, the leasing of grazing rights on public domain, and the development of recreational facilities for the public.

In the latter part of the twentieth century the government agencies continued to shape human activities in the region. Some actions—such as the spraying of the hillsides to eliminate the verdant forest understory—provoked heated debates about the environment and the wisdom of pouring chemicals into a delicate ecological system. Other actions such as the compliance with various environmental laws and multiple use mandates were heralded with more popular acclaim. Repeatedly the roles of the federal government had impact on the lives of residents of the region.

Of critical importance to the budgets of several western Oregon counties was the re-vestment of the lands of the Oregon and California Railroad. Although many quibbled about the various formulas under which revenues from the sale of timber on these lands were returned to the counties, few residents protested the role of the Bureau of Land Management and the U.S. Forest Service in managing, selling, and passing on to county governments millions of dollars each year.

**Exploration and Survey**

Some of the lands of the Salem BLN District were first viewed by the official U.S. government expedition mounted in 1804-06 by Meriwether Lewis and William Clark. This multi-faceted enterprise brought a contingent of men to the Pacific Ocean by way of the gorge of the Columbia River. The leaders, Lewis and Clark, collected data on the ethnography and language of the Indians, the natural history, geology, and weather. The detailed field notes as well as the eight volumes of diaries kept by the expedition leaders, including nearly two volumes written during their winter at Fort Clatsop on the Lower Columbia, provide fascinating information on the region and its Indian inhabitants (Devoto 1953; Goetzmann 1966:13-19).

Although William Scammon visited Oregon Territory under the auspices of the administration of Andrew Jackson in the 1830s, the next major expedition outfitted at public expense was that of Lt. Charles Wilkes. The U.S. South Seas Surveying and Exploring Expedition came to western Oregon in 1841. Several parties explored the territory, including the one under Lt. George Emmons which passed through the Willamette Valley on its way to California. Wilkes himself visited the Willamette Falls and the upper part of the valley, including the Methodist Mission (Wilkes 1845, Vols. 3-4).

The extension of territorial status to Oregon under the Organic Act of 1848 was of significance in several ways. Important for furthering an understanding of the land's resources was that this measure led in 1850 to the passage of the act creating the office of Surveyor-General of Oregon. With this legislation the federal government established in
short order the Willamette Meridian and the Base Line for the survey of lands in the territory. By the mid-1850s much of the Willamette Valley and thus many of the lands later to become part of the Salem BLM District were examined by the crews preparing the original cadastral maps. These projects established a data base which covered the distribution of vegetation, settlement, and open areas. In the township summaries the surveyors often commented upon the potentials for development of the areas they had surveyed (Johansen 1967; Bowen 1978).

Partially through official exploration but particularly through the financing of the survey of the lands of the territory the federal government significantly added to the understanding of the Willamette Valley and its nearby areas. Many of the surveyors liked what they saw and filed upon or purchased lands themselves. Some, at the turn of the twentieth century, became involved in the notorious Oregon land frauds. Assisting in the filling of dummy entries for timberlands, they became ensnared with corrupt politicians. All were eventually brought to "justice" through the workings of a Special Prosecutor in the courts in Portland, Oregon (Puter 1908).

Military Posts

The federal government under the Constitution of 1789 reserved to itself dealing with the American Indians. In 1849 the Office of Indian Affairs established the Oregon Superintendency of Indian Affairs for dealing with the native inhabitants of the territory. While the initial relationships were mostly in terms of treaty negotiations for land cessions or attempts to establish peace following conflicts, the government by 1856 was involved in the establishment of Indian reservations and military facilities to surround them. In the summer of 1856 the U.S. Army completed Fort Hoskins in Kings Valley and Fort Yamhill on the South Fork of the Yamhill River. The former post was to guard the eastern side of the massive Siletz Reservation between the Coast Range crest and the sea, while the latter post was to watch over the Indians of the Grand Ronde Reservation in the Yamhill region (Bense 1950:197-215).

These military posts drew in companies of soldiers who erected the buildings, cleared the parade grounds, and commenced the largely monotonous duty of a Pacific Coast "shovel" (tour of duty). The objectives of the U.S. Army were twofold: to keep the Indians on the reservation and to keep the whites off such properties. In these missions the men at the forts were largely successful. After June, 1856, Indian conflicts west of the Cascades were virtually eliminated. The program of segregating the Indians into the reservations and subjecting them to programs of "civilization" was well executed. In fact when the Civil War commenced in 1861, the Army began withdrawing its experienced soldiers from the Oregon posts and so reduced staffing that some establishments such as Fort Umpqua on the Oregon Coast were abandoned entirely. Forts Hoskins and Yamhill were staffed by volunteers mostly recruited in California. At the end of the Civil War these stations, too, were disposed of and the military occupation ended (Beckham 1977:149, 160, 1971).

Not until World War II did any large scale military action have impact in the general area of the Salem BLM District. With the outbreak of that conflict in December, 1941, the U.S. Army established a large training center for operations in the South Pacific in northern Benton County. Known as Camp Adair, this post grew to more than 50,000 residents during the war years and was heralded, briefly, as Oregon's third largest town. The site was almost abandoned by 1946 and revived only briefly in the late 1950s when it became part of an enemy aircraft detection center and computer facility (McArthur 1974:105).

Also during World War II the American government constructed the Tillamook Air Station in the lowlands east of Tillamook, Oregon. Two massive buildings, the largest wood frame structures ever erected in the state, housed up to nine blimps which were engaged in aerial reconnaissance for submarines. Although weather conditions often made the patrols of the blimps difficult and dangerous, the air facility operated for the duration of the war. In the 1960s the blimp hangars became shelters for the Louisiana-Pacific sawmill operations (Anonymous 1972:192).

Aids to Transportation and Commerce

Several federal government actions had important impact upon the evolving transportation systems and burgeoning economy of the Salem BLM District. The first work in this area was the hydrographic survey of the Columbia River estuary carried out by the Wilkes party in 1841. This was followed by the U.S. Coast Survey which prepared charts of the bar and river in the 1850s. Eventually the U.S. Lighthouse Board constructed light towers
at Warrior Point at the mouth of Multnomah Channel and placed navigation markers along the river and the lower Willamette. These actions measurably assisted the mariners who carried the products of the Willamette Valley to world markets (Gibbs 1955:92, 108).

Key to the commerce of the Willamette River, however, was a system of portage railroads or locks at the falls at Oregon City. The first lock project was launched by private investors in 1861. In 1868, assisted by $200,000 of state funds, the company completed a series of four locks. These facilities remained in private hands until April 26, 1915, when the federal government paid $375,000 to Portland Light and Power Company for the locks. Under government ownership the maintenance was assured and after 1915 all passage was free to those wishing to move up or down the river by water (Lynch 1973:262-66).

On the Yamhill River the rapids at Lafayette blocked nearly thirty miles of navigable water reaching far into the South Fork of the Yamhill Valley. Although several private companies tried to raise money to build locks at the rapids, none succeeded in its endeavors. In June, 1897, however, Congress appropriated $160,000 to supplement an initial grant of $40,000 awarded on June 3, 1896, for the building of facilities. The locks--275 feet long--opened on September 21, 1900, and became a feature of transportation in the area. Although outmoded by prior railroad construction, the Yamhill Locks remained important in log transportation until they were blasted out in the late 1950s (Corning 1973:189-90).

In the area of road construction the government also played an important role. In 1855 Congress responded to the pressure of the territory's delegate, Joseph Lane, to fund the building of a military road from Astoria to Salem. The road was surveyed by L. George H. Dorby in 1856 and ran through the Nehalem watershed, over the Coast Range to Dairy Creek on the western verge of the Tualatin Plains, and southwest through Yamhill County to Salem. The construction efforts were very limited and the road played little importance (Jackson 1952:75-79).

In the 1860s the Congress made several additional grants to Oregon for the building of wagon roads. The plan was to transfer to the state vast tracts which would be then awarded by the legislature to private road companies as subsidies for building routes which would assist commerce and military movement in the state. Of routes important to the Santiam country, was secured and partially opened by the Willamette Valley and Cascade Mountain Wagon Road Company. This firm and the comparable outfit building west from Corvallis eventually secured hundreds of acres for somewhat slapshod construction. Neither of the routes was especially successful in drawing extensive travel or commerce. Both, however, helped pass tens of thousands of acres of public domain into federal ownership into private hands (Due and Juris 1968; Jackson 1949).

In the early twentieth century the intensification of federal land use activities through the U.S. Forest Service and the General Land Office led to trail systems and by the late 1920s to roads on many public lands in the Salem BLM District. In some instances the inducement for these "improvements" was simply fire protection. On other occasions, however, the desire to harvest timber and improve public access led to the outlay of capital for the construction of transportation routes.

Land Policies

Under the Donation Land Act of 1850 the Congress set up a system for disposing of vast amounts of the Willamette Valley. Even though prior treaty session of lands from the Indians had not cleared the title, the government set up a way for individuals to secure up to 320 acres each, simply by settling upon the land before 1850 or, under modified terms, by 1855. Before the expiration of this act more than 2.5 million acres, including almost all of the valley floor of the Willamette and its tributary streams, had been secured by settlers. In Oregon Territory south of the Columbia River these pioneers filed 7,437 claims (Johansen 1967:233-34).

Under the region's provisional government land claims had been recorded in temporary land offices. In 1855, however, the federal government established the Oregon City Land Office. This location became the center of most land filings for the Salem BLM District in the nineteenth century (Johansen 1967:232; Genealogical Forum of Portland, Oregon 1962, Vol. 3).

The Republican-dominated Thirty-Second Congress on May 20, 1862, passed the Homestead Act, a measure effective on January 1, 1863. This law granted to pre-emption holders of unsurveyed lands the opportunity to secure 160 acres for $1.25 per acre or 80
acres for $2.50 an acre. "The Homestead Act breathed the spirit of the West, with its optimism, its courage, its generosity and its willingness to do hard work," wrote Paul W. Gates. For surveyed lands claimants could gain their acres merely by registering their claim, paying a filing fee, and remaining on the land under the residency and improvements stipulations (Gates 1968).

The grants of land to various road companies, including such firms as the Oregon and California Railroad in the 1870s, opened up other vast sections of public domain for settlement. Those who built the wagon roads and railroads were frequently eager to sell their lands to settlers. The sales would enable them to raise badly needed cash for capital improvements; the arrival of settlers meant that passenger travel and shipment of goods might soon occur and bring remuneration for the building of the routes (Gaston 1912:1:326-36).

The federal government conveyed other lands to the State of Oregon under the Swamp Land Act of 1850. The state gained 286,108 acres which were deemed to be water-saturated or submerged lands. While few of these tracts were in the Salem BLM District, in other parts of the state lands for ranchers, especially when the State Legislature fixed the sale price at a dollar an acre and generous terms for payment (Gates 1968).

The Timber and Stone Act of 1878 permitted filings upon 160 acre parcels in Oregon, California, Nevada, and Washington Territory for those willing to pay $2.50 per acre. Again, this measure aided both settlers and speculators to secure parts of the public domain.

Revestment of Oregon and California Railroad Grant Lands

One of the most significant ways in which the federal government has had impact on the Salem BLM District and the residents of western Oregon has been through its revestment of the lands granted in 1866-69 to the Oregon and California Railroad. As a land-grant road, the Oregon and California Railroad Company was entitled to approximately 5,000,000 acres in the Willamette, Umpqua, and Rogue River watersheds. The terms of the grant had required sale, however, of the lands to actual settlers in parcels of not greater than 160 acres. In several ways the company did not comply with the terms of the grant.

By 1890 the O & C had failed to build its lines through to California. Thus the original plan of a West Coast connection from the Columbia River to San Francisco Bay had not been achieved. To avoid paying taxes on its grant lands, the company had patented only 3,184 acres of the nearly 5,000,000 acres being withheld from public entry to reserve for its enterprises. Of the patented acres, many were not conveyed to settlers. Oregonians and others suspected that the railroad would likely sell vast tracts to timber companies.

In the 1890s the O & C passed to the Southern Pacific Railroad Company and was merged into the Harriman lines in 1901. Harriman stopped any further sale of land and stated, after 1906, that the San Francisco earthquake and fire had destroyed most of the records. In February, 1907, the Oregon Legislature sent a memorial to Congress asking that body to compel the Southern Pacific to comply with the terms of the land grant to the O & C. Investigations made by the Department of Justice confirmed violations of the terms of the original grant and the U.S. government began suit for recovery of the lands.

Among the terms of the grant had been the requirement that the land was to be sold in amounts of $2.50 per acre. Also among the alleged violations was the sale of land in lots of less than small parcels. The litigation which went to the U.S. Supreme Court in 1915 produced seventeen volumes of testimony (Ganoie 1924:339-40).

On June 9, 1916, Congress passed an act compelling the reversion of the unsold O & C lands to the government. John Tilson Ganoie, who has assessed this revestment, wrote:

> By this Act the title of the unsold land reverted to Congress, but granted to the railroad company for the land thus appropriated $2.50 an acre, the sum allowed them in the Act of Congress, April 10, 1869. The Secretary of the Interior was to determine the amount of land already patented by the company and that to which they would rightfully have claim and pay the company from the proceeds of the sales of the land the $2.50 per acre (Ganoie 1924:340).
For several decades the revested O & C lands were administered by the General Land Office and then by its successor, the Bureau of Land Management. The revestment act required that the timber on these properties be sold at the current market price. In 1937, in part because such sales were deemed to be a "threat" to lumber prices, the O & C lands were assigned to sustained yield management. The annual cut was fixed at 500,000,000 board feet per year. The federal government was committed to handling the O & C lands in western Oregon: "for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities." Although the volume of cut has since been altered, the multiple purposes of the O & C revestment continue to the present day and are the management responsibility of the Bureau of Land Management (Johansen 1967:614-615).

Summary

In many ways the federal government has had impact upon those who have lived in the general area of the Salem BLM District. Since the extension of territorial government to Oregon in 1848, the national government has formulated funding of projects and land policies which have improved the conditions for settlement and the economy. Sometimes simple actions such as authorizations for postal stations have had major importance to rural populations dependent upon the government for carrying of messages and parcels. In larger ways in navigational aids and mapping the federal government has significantly assisted in the development of the region.

In the twentieth century the Bureau of Land Management and the U.S. Forest Service have administered both revested grant lands and public domain for timber sales, water use, recreation, and other purposes. These actions have helped shape the economy and life ways of the residents of western Oregon.
CULTURAL RESOURCE SYNTHESIS

The lifeways of the aboriginal peoples who were inhabiting northwestern Oregon when the first Euro-American explorers arrived in the region represent the end-products of local cultural traditions which developed over a period of several thousand years. These local traditions were closely adapted to the specific subsistence resources available within each of the four distinct cultural-ecological provinces found in this region: namely, the Lower Columbia Valley, the Willamette Valley, the Northern Oregon Cascade Range, and the Northern Oregon Coast.

Archaeological research in the Lower Columbia Valley—that area along the Columbia River from The Dalles to the Pacific Ocean—has a long history. Most of the archaeological fieldwork has been carried out in conjunction with dam and reservoir construction. Archaeological evidence in this area indicates a very long and intensive occupation by prehistoric peoples. Two cultural-historical sequences—one based on data from the Dalles area and the other from the Portland Basin—have been developed for organizing the archaeological record in the Lower Columbia Valley.

The first cultural-historical sequence, based upon excavations in The Dalles area in the 1950s, is most important for the information it provides concerning earlier Columbia River cultures. This sequence consists of three main stages: Early, Transitional, and Late. The Early Stage, which dates from 9785 to 7076 years B.P., is characterized by an artifact assemblage which includes flaked stone tools such as burins, blades, and leaf-shaped projectile points, as well as an abundance of bone and antler tools. Enormous numbers of salmon vertebrae indicate that a riverine adaptation oriented around salmon fishing was being practiced at this time.

The Transitional Stage, from 7075 to 6090 years B.P., is marked by the presence of only a few artifacts, a situation which apparently reflects relatively light occupation during this period. The Late Stage, from 6090 years ago to the beginning of the historic era, is characterized by a renewed intensive use of the area and the introduction of new artifact styles. The cultural renaissance which occurred during this period is usually attributed to either the introduction of new aboriginal populations into the area or perhaps to increased contacts through trade among the aboriginal groups in the region.

The second cultural-historical sequence for the Lower Columbia Valley is based upon recent fieldwork in the Portland Basin. This sequence covers the last 2600 years of prehistory in this area, and thus is most informative concerning the late prehistoric and early historic time periods. The sequence consists of two main phases which are defined on the basis of the relative proportions of certain artifact types.

The Merrylee Phase, from 600 B.C. to A.D. 200, is characterized by broad-necked projectile points (which indicate use of the atlatl), stemmed drills, perforated ground stone pendants, and peripherally flaked pebbles. The subsequent Multnomah Phase, from A.D. 200 to 1350, is characterized by narrow-necked projectile points (indicating use of the bow and arrow), mule-ear knives, self-handled heavy percursors, clay figurines, and incised clay tablets. Euro-American trade items were introduced near the end of the Multnomah Phase. The impression conveyed by the cultural-historical sequence in the Portland Basin is generally that of a cultural continuum, although changes did occur in artifact styles over time. The way of life followed by the historic Chinook Indians was apparently practiced for at least the last 2600 years in the Portland Basin of the Lower Columbia Valley.

Archaeological research in the tributary Willamette Valley also has a long history. While archaeological research in conjunction with dam and reservoir construction has also been conducted in this area, most of the archaeological fieldwork carried out in the Willamette Valley to date has been the result of university-based research programs. A key factor in the development of the prehistoric cultures inhabiting this area was the presence of Willamette Falls near present-day Oregon City, which impeded the migration of anadromous fish into the central and upper Willamette Valley. As a result, the aboriginal peoples living above the falls were largely denied access to the salmon harvests so important in the economies of other native peoples in the Pacific Northwest.

A chronological framework consisting of five periods has been proposed as the basis for ordering the archaeological record in the Willamette Valley. Period I (8000-5000 B.C.) is represented primarily by two alleged associations of cultural materials by mammoth remains reported during the 1940s, neither of which has been accepted uncritically by later archaeologists. On the other hand, the presence of aboriginal peoples in this area during this early time has been conclusively demonstrated by the finding of a Clovis fluted projectile point, which elsewhere in North America have been found in contexts dating as early as 11,000 years ago.
Period II (6000-4000 B.C.) is defined on the basis of three sites, all of which are located on the eastern periphery of the Willamette Valley in the foothills of the Western Cascades. The hallmark artifact for this period is the leaf-shaped "Cascade Point," although towards the end of Period II large side-notched projectile points come to predominate. The artifact assemblages from the Willamette Valley sites occupied during Period II seem to indicate a subsistence pattern with a primary emphasis on the hunting of large game, supplemented by some seasonal plant collecting and hunting of smaller mammals and fowl.

Period III (4000-250 B.C.) is primarily defined on the basis of information from the lower components of three archaeological sites on the Willamette Valley flood plain. Artifact assemblages dating from this period are characterized by a variety of corner-, side- and base-notched projectile points, as well as large basalt bifaces and crude scrapers and chopping tools. The earliest evidence for the utilization of canes and acorns—known to have been staples of the historic Kalapuya Indians in this area—dates from this period. Mortuary practices were characterized by flexed inhumations occurring in simple pits, with heads oriented to the west. The only evidence of an aboriginal habitation structure so far discovered in the Willamette Valley also dates from this period.

Period IV (250 B.C.-A.D. 1700) is the best known period in Willamette Valley prehistory, as most of the archaeological sites so far investigated contain components which were occupied during this time. The artifact types most diagnostic of this period are a variety of small projectile points, many featuring deep serrations along the edges, which are of a size suggesting use with the bow and arrow. Also for the first time, antler and bone tools are found in large numbers in Willamette Valley sites. The basic mortuary pattern of flexed inhumations in simple pits continues as the most common method of interment, although the inclusion of grave goods with burials becomes more frequent. Coast-Willamette Valley trade becomes intensive during Period IV, as indicated primarily by the presence of a variety of marine shells in Willamette Valley sites.

Period V (A.D. 1700-1850) encompasses protohistoric and early historic times in the Willamette Valley, and is indicated by the presence of Euro-American trade items in aboriginal contexts. Very few sites are known to have been occupied during this period, a situation which is consistent with the rapid decline in the aboriginal population of the valley as a result of the introduction of European diseases.

In comparison with the amount of archaeological research conducted in the Lower Columbia and Willamette valleys, very little work has so far been carried out in the adjacent Northern Oregon Cascades. To date, excavations have been undertaken at only four sites in this upland region. The scanty information available from these excavated sites, however, does indicate that aboriginal peoples have been utilizing the resources of the Cascade Range over a time span of several thousand years. In general, the size and nature of the archaeological remains recorded in the Northern Oregon Cascades seem to indicate temporary, seasonal use by small aboriginal groups in search of large game, vegetable foods, and other resources.

The archaeological record along the Northern Oregon Coast is also poorly known at this time. Evidence from the few sites so far investigated in this coastal area indicates that prehistoric populations relied primarily on a combination of natural resources from marine and riverine environments. As of this time, the earliest known sites along the Northern Oregon Coast are less than 3000 years old. This situation is due in large measure to the rise in sea level which occurred during the early postglacial climatic interval. Any evidence of aboriginal occupation along the Oregon coast prior to 6000 to 7000 years ago is likely to have been submerged beneath the rising ocean.

In early historic times, northwestern Oregon was utilized by six major linguistically distinct Indian groups which are now generally recognized as the Kalapuya, Molala, Alsea, Tillamook, Chinook, and Clatskanie. Despite the remarkable linguistic diversity among these peoples, all shared a relatively homogeneous cultural base. In general, these Northwest Coast societies were characterized by an economy based on the exploitation of varied marine resources, particularly salmon; a weakly defined political system in which the autonomous village was the primary political unit; individual status defined to a considerable extent by the acquisition of wealth; the elaboration of woodworking, social interaction facilitated by water transport; and participation in a highly developed regional trade system. The Kalapuya, and to a lesser degree the upland Molala, proved the most abantant to this overall cultural pattern, as their subsistence base and related technology focused on land-based resource exploitation, instead of the primary regional dependence on marine resources.

The basic pattern of subsistence activities throughout the area, however, entailed utilization of diversified plant and animal products following a biseasonal cycle. During the winter months, social and economic activities centered around relatively stable permanent
villages which were characterized by the presence of large, multiple family dwellings generally located along the banks of major river courses. From early spring until late fall, villages tended to be dispersed into smaller task-oriented units, establishing temporary campsites near resource areas or at special sites of social importance. Extensive communication and trading among many of these native peoples was evident by the prevalence of intergroup marriages, head deformation of free-born infants, shared material and food products, and widespread use of a trade language, at least during the more recent ethnographic period.

The aboriginal lifeways of these peoples were first observed and reported by Euro-American seamen in the late eighteenth century. However, in less than a century of interaction, these native cultural patterns which extended millennia into the past were severely altered due to the combined factors of introduced diseases, disruption of their economic system in response to desires for foreign goods, and encroachment of American settlers into Indian resource areas. By the late 1850s the majority of surviving northwestern Oregon Indians had been removed to the Coast (Siletz) and Grand Ronde reservations in western Oregon, essentially bringing to an end the cultural systems which had evolved in response to unique environmental conditions over a period of thousands of years.

The historic period commenced in the late eighteenth century in the Pacific Northwest with the maritime explorations in the Age of the Enlightenment. Removed from the coast and isolated from the broad estuary by the Willamette Falls, most of the Salem BLM District lands lay outside of the areas first touched by mariners from distant lands. This interior part of western Oregon remained isolated even from the first major land expedition, that of Meriwether Lewis and William Clark, which came to Oregon in 1805-06.

The slow entry into this region by non-Indians did not occur until 1811 when fur seekers entered the Willamette Valley to establish their depots and spy out the region for its resources. Some of these men liked what they saw and for a period of nearly twenty years the brigades passed up and down the main course of the Willamette. Occasionally fur seekers ventured into the Cascades or crossed through the Coast Range to explore along the edge of the Pacific Ocean. The growing awareness of the region was fostered by the interests of the fur trade.

In the late 1820s retiring employees of the Hudson's Bay Company decided to settle upon the fertile meadows which they had seen along the Willamette River at French Prairie. Their community was a unique one on this frontier. Largely French-speaking and Catholic, these families were also almost always part or half Indian and represented a merging of two races as well as the life ways of peoples of strikingly different backgrounds, technologies, and subsistence patterns. Of any who could have carried out this "merger," the fur seekers, men of independent spirit, were probably the best suited. In the late 1830s and the early 1840s they created on the main floor of the Willamette Valley and in the nearby Chehalis and Tualatin country a rather distinctive, frontier society.

The 1830s were critical for the Indians who resided in the Salem BLM District. Between 1830 and 1832 these people were beset with the terrible fevers which killed perhaps as many as seventy-five percent of them. These years of disaster wiped out entire villages and left the survivors without the support mechanisms to continue many of their age-old traditions. The remnants of the various bands were unable to resist in any way the encroachments of whites upon their lands and in 1856-57 were, at last, removed to the Grand Ronde Reservation on the South Fork of the Yamhill River.

The American missionaries who came to preach to the Indians in the Willamette Valley in the mid-1830s had scant success. While they labored hard and brought in both capital and reinforcements, their real success was in serving as the nucleus for an American community in the region and for advertising the resources of western Oregon to their countrymen in the Mississippi Valley. The letters to the "states" touted the salmon runs, the plentiful game, the luxuriant grass, and the fine soil. The gentle weather and mild winters also were subjects upon which the missionaries wrote at length.

In 1841 and in succeeding years a trickle and then a flood of Americans began entering the lands adjacent to the Salem BLM District. Finding no Indian resistance, these pioneers deemed that God had set aside this region for them. More than 3,000 Americans crossed the Oregon Trail to the Willamette Valley in 1845 and increasing numbers came in succeeding years. The old settlement at French Prairie was soon passed by as families moved into the watersheds of the Luckiamute, Yamhill, Tualatin, Clackamas, Molalla, and Santiam rivers. In the Mary's River region a few settlers by the 1850s ventured west into the Alsea Valley. Others crossed the Coast Range in the 1870s to settle along the Nestucca.
The American families who chose to settle in western Oregon in the mid-years of the nineteenth century were, for the most part, native born citizens whose background was in agriculture. They came to till the soil, raise livestock, secure farmlands, and persist in the life-style they had known or aspired to possess in some other part of the country. While many did not initially attain the monetary success they sought, most found a good life and became content residents of Oregon. They replicated the institutions of government, religion, and society which they had known elsewhere. While they possessed the unique opportunity to be innovative and creative, on the whole this generation set a trend which, if anything, could be described as "nostalgic." They hungered for that which they had known somewhere else.

The intellectual currents flowing in western Oregon in those pivotal years of settlement and establishment of institutions were well reflected in the region's architecture between 1850 and 1890. During that forty year interval virtually every well-known American style from east of the Mississippi was replicated on the Oregon frontier. Although the execution of the "built environment" was sometimes somewhat ridiculous in that the carpenter-architects had but hazy recollections of the elements of the style they were attempting to recreate in Oregon, on the whole they succeeded. Thus the region soon exhibited Italianate, Gothic Revival, Greek or Classical Revival, and Queen Anne buildings. These structures sheltered the congregations of Baptists, Methodists, Catholics, and Presbyterians who had worshipped in similar buildings elsewhere in the country. The more palatial of the houses announced to the community that certain individuals had prospered in this new land and were not at all different from their counterparts in the East.

Adjacent to the BLM lands in the Salem District were by the 1870s and the 1880s the farms homesteaded by many residents of the state who did not possess much capital. Some of these people were foreign born immigrants; others had come to Oregon hoping for a better day than what they had known elsewhere. Many of these families adopted a "subsistence" life-style and lived close to nature and the land. They grew some vegetables, hunted, and worked seasonally for wages, and eked out an existence. In the simplicity and isolation of their life, they differed somewhat markedly from their fellow Oregonians who settled in the valley towns along the Willamette River. Often they had much less education. Their material possessions, ability to travel widely, and awareness of larger world events were also sorely circumscribed. Yet, in spite of these seeming disabilities, many families elected to continue this life-style well into the twentieth century. Indeed, some young families in the 1960s and the 1970s embraced a new "back-to-the-earth" ethic and began a subsistence existence in those decades as a protest to the affluence and anonymity of life in a world too much dominated by machines and events which they did not comprehend or did not want.

Although the fur trade had sparked white interest in the Willamette Valley, agriculture became the first major economic force in the historic period. Both farming for the production of cereal crops and fruit as well as stock-raising were aspects of the agricultural enterprises of the region. Wheat, logs, and cattle were favored enterprises by agriculturists. Special trends which developed were a nascent tobacco industry, a vineyard which largely vanished by the 1880s, and by the 1890s an explosive development of hop-raising and prune production.

From the early 1850s onward, logging and lumbering became fundamental industries in the region. Although the fields of operation shifted over the decades, the timber industry was to remain a central factor in the economy for more than 130 years. From initial cutting along the Lower Columbia River, the timber companies moved into the Gorge and then into the Willamette Valley. Eventually they pushed into the Cascades and the Coast Range and tapped the timber by constructing logging railroads. Until the 1920s Portland was the center of much of the sawmill manufacturing of lumber. The city's large labor force and the railroads on the Willamette River upon which logs were rafted contributed to its importance. Above all, the city held the interest of the investors with the capital to finance the construction of large mills and to secure the latest equipment for cutting the logs.

Slowly tourism became an event which brought residents of the region onto the BLM lands. The wilderness which surrounded the Willamette Valley had many scenic vistas and opportunities for those who wished to picnic, fish, hike, or camp. This activity was fostered by the development of tourist facilities at many of the hot springs or mineral water springs in the western Cascades. It grew further with the widespread availability of automobiles in the 1920s and the actions of the federal government in the 1930s to develop tourist facilities on public lands. The picnic grounds and camping areas laid out and built by the C.C.C. and the W.P.A. appealed to city-dwellers who wanted to "rough it" in improved sites.

As in other parts of the country the Salem BLM District was the setting for evolving modes of transportation. In the historic period the first visitors had come by canoe or horseback. In the 1840s the overland emigrants passed through the region in their wagons
on the Barlow Road or by raft or boat through the Columbia Gorge. From the short, portage railroads of the 1850s came the improved wagon roads, funded by Congressional land grants in the 1860s. In that same era, too, railroad builders envisioned a system to tie Oregon to California and the rest of the nation. In the 1870s several companies laid track, including the Oregon and California Railroad. Its revested land grant, administered in the twentieth century to a large degree by the BLM, was a generous subsidy which drew in investors seeing the potential of a large return on their capital. By the late 1880s the region also had feeder rail lines which connected distant towns to the communities along the Willamette River.

On the rivers the steamboats were an important means of transportation from the 1850s until the 1910s. Improvements to aid the river boats included the locks at Oregon City and at the rapids on the Yamhill River. Occasionally the government provided money for snag removal, channel dredging, and stabilization of stream banks. In fact, the government's presence was felt in much of the transportation in western Oregon through the land grants to road companies.

Throughout the historic period the federal government has taken actions which have affected the residents of the Salem BLM District. Government-financed explorers spied out the region and publicized its resources. The federal government established relations with the various Indian groups, secured cession of their lands, and moved them to reservations. Territorial status for Oregon in 1849 meant suddenly that the region would receive post offices, customs houses, military detachments, and other "benefits." The landscape, too, was affected by the rectilinear prior survey which, after 1850, established the lines for determining townships and sections. The government land offices registered the Donation Land claims, homestead filings, and other means of disposition of the public domain.

Thus it can be concluded that in many ways the Salem BLM District falls within the larger fabric of western American history. The common forces and courses of events known on other frontiers can in most instances be found in this district. While the region exhibits little distinctiveness which makes it unique, it is clearly a land of uncommon beauty and attraction. Its history is rich and varied. The challenge remains for the appropriate, interpretive studies to ferret out the actions of humans who have made this land the place that it is.
FUTURE RESEARCH DIRECTIONS

An eventual goal of the Bureau of Land Management's cultural resources management program is the development of a predictive model for the distribution of cultural resources on lands under its jurisdiction. In order to obtain a valid predictive model, a variety of factors which contribute to the patterning of cultural resources must be understood. An understanding of the physical nature of cultural resources, as well as their temporal placement and cultural and geological context within the region in which they are found, is essential for the appropriate management of cultural resources. Until the utilization patterns of both the aboriginal and historic Euro-American peoples have been delineated for the region, the significance of cultural resources located on BLM lands cannot be accurately assessed. The following series of research questions are proposed to better determine those factors which contributed to the patterning of cultural resources within the BLM Salem District.

ARCHAEOLOGY

A great majority of the BLM lands within the Salem District are located in the foothills and mountains of the Cascade and Coast Ranges peripheral to the Willamette Valley. To date these areas have not attracted much attention from professional archaeologists, and as a result very little information pertaining to prehistoric utilization of these upland areas is presently available in the existing archaeological literature. In some cases, systematic surface collections or test excavations have been conducted at any of the 57 archaeological sites on or near Bureau lands in the Salem District. Consequently, any archaeological research conducted on lands within the BLM Salem District can be expected to contribute considerably to knowledge of the prehistory of the region as a whole. The following archaeological research problems can be identified in this region.

1. Cultural Sequence

There is a pressing need for the development of a refined, detailed cultural sequence in which archaeological manifestations in different areas of northwestern Oregon can be related. A foundation for such a chronological framework has been established with the development of the Lower Columbia culture sequence by Pettigrew (1977). This sequence was rigorously defined through computer seriation of artifact assemblages from seven major sites in conjunction with their correlation with numerous radiocarbon dates. On the basis of these data, a culture sequence has been delineated which encompasses the last 2,000 years of Lower Columbia prehistory. Comparison of this sequence with artifact assemblages from sites located elsewhere in the Pacific Northwest indicates that there were changes in material culture in these areas which were similar, if not identical, to trends observed along the Lower Columbia River (Pettigrew 1977:333-368). Further research should be directed toward correlating shifts in the popularity of artifact styles which will make it possible to relate archaeological manifestations from different areas into a single chronological framework for interpreting the development of aboriginal cultures in northwestern Oregon and adjacent regions.

2. Antiquity of Human Occupation

At the present time the earliest cultural feature on the floor of the Willamette Valley is Luckiamute Hearth, which has been radiocarbon dated at slightly over 5,000 years old (Reckendorf and Parsons 1966). Archaeological research elsewhere in the Pacific Northwest, for instance at The Dalles of the Columbia River (Cressman et al. 1960), has documented the presence of aboriginal peoples in the region at least as early as 10,000 years ago. Why has evidence of prehistoric occupation earlier than 5,000 years old not been previously documented on the floor of the Willamette Valley?

A likely explanation is that most archaeological research so far has been concentrated in the southern end of the Willamette Valley, where meandering streams have deposited alluvium over most geomorphic surfaces more than 5,000 years old. In the northern Willamette Valley, however, stream channels are more deeply incised, and as a result much greater areas of early geomorphic surfaces remain exposed (see Bolster and Parsons 1968). Indeed, it is in the northern Willamette Valley that most paleontological discoveries of Pleistocene fauna have been reported. It thus seems likely that the northern Willamette Valley—encompassed by the BLM Salem District—may be the most fruitful place in northwestern Oregon to undertake a systematic search for evidence of earlier prehistoric occupations in the region.
3. Aboriginal Subsistence-Settlement Patterns

One of the major problems confronting archaeologists when attempting to interpret the nature of the activities carried out at archaeological sites is the lack of a detailed model for aboriginal subsistence and settlement within the region. The relative scarcity of ethnographic information on the Kalapuya of the Willamette Valley, as well as neighboring aboriginal groups, is in contrast to the situation in other regions of North America (notably California and the Great Basin), where fairly extensive information on the lifeways of aboriginal populations is available.

Fortunately, a foundation for the eventual development of a refined model of aboriginal subsistence and settlement in the Willamette Valley is provided as a result of the recent manuscript research of Zenk (1976), who was able to assemble a considerable quantity of data on the subsistence practices of the Tualatin band of Kalapuya. The problem remains for archaeologists, however, to directly relate this ethnographic information on the Tualatin to the archaeological record. Further research, both of an archaeological and ethnographic nature, is also clearly necessary in order to develop subsistence-settlement models for prehistoric populations which occupied areas elsewhere in the region.

It should be particularly stressed that greater documentation is needed of the intensity and range of prehistoric use and occupation of the Cascade and Coast Ranges in northwestern Oregon. How did archaeological sites in upland areas on the periphery of the Willamette Valley fit into the settlement-subsistence systems of the prehistoric peoples who inhabited this region? What were the nature and range of activities carried out at these upland sites? Was there a change in the function of these sites or in the intensity with which they were used over time?

For example, as a result of archaeological research in the Clackamas River drainage, Woodward (1976) suggested that a general adaptation oriented toward a pattern of east-west seasonal transhumance was established in the Cascade foothills prior to 3000 B.P. After this time, however, a riverine adaptation apparently developed with a corresponding decrease in the exploitation of foothill resources by prehistoric peoples. Can this postulated shift in prehistoric settlement and subsistence patterns be documented elsewhere?

Aside from determining the ways in which aboriginal peoples utilized upland environments, a number of questions regarding the cultural affiliation of the archaeological sites in the Cascade Range have been raised. Were these sites primarily utilized by aboriginal peoples coming from the Willamette Valley to the west or from the Columbia Plateau or Great Basin to the east? Or, alternatively, are the archaeological complexes found at these sites indigenous to this upland region and not strongly related to cultures on either side of the Cascade Range as suggested by Grayson (1975).

In the past, the upland areas, which comprise most of the BLM Salem District's lands, were largely ignored by archaeologists, at least in part because of the emphasis placed on the excavation of large stratified middens usually found only in the adjacent river valleys. The heavy forest cover and rugged terrain has also tended to discourage archaeological research in these upland areas. The holistic emphasis in archaeology on reconstructing entire subsistence-settlement systems, however, makes it essential that archaeological manifestations in upland areas be investigated. The use of the Cascade and Coast Ranges is poorly documented ethnographically, and it is clear that future information on aboriginal occupation of these upland areas will largely come from the study of the archaeological record.

4. Paleoclimatic Considerations

Archaeological research in other regions of North America has suggested that fluctuations in climate in prehistoric times have brought about changes in the subsistence patterns and material culture of aboriginal peoples. The best example of this situation is the apparent (and much disputed) effects of the hot and dry climate of the Altithermal interval from 7000 to 4500 years ago on the prehistoric populations of Great Basin (Antevs 1948, 1955). In the Pacific Northwest this same warming and drying trend is most often referred to as the Hypithermal, and is estimated to date between 8000 and 4000 years ago (Hansen 1947:116; Heusser 1960:184). Did the warmer and drier climate of the Hypithermal cause a change in the lifeways of aboriginal peoples in northwestern Oregon?

One possible case of climatic change affecting prehistoric populations has been suggested as occurring at The Dales, where a fluctuation in the intensity of occupation and the appearance of new artifact styles was hypothetically related to the movement of aboriginal peoples in response to climatic changes associated with the Altithermal (Cressman et al. 1960:65-70). Another possible case of climatic change affecting the lifeways of prehistoric peoples may have involved the shift from an adaptation based on seasonal transhumance in the Cascade foothills to a riverine-oriented adaptation which Woodward
(1974) postulated to have occurred in the Clackamas River drainage near the end of the Hypsithermal interval around 3000 years ago.

Climatic fluctuations associated with the Hypsithermal interval may have affected other aspects of aboriginal subsistence practices as well. For example, it is interesting to note that the earliest evidence for the utilization of acorns by the prehistoric inhabitants of the Willamette Valley occurred at Luckiamute Hearth which has been radiocarbon dated at slightly more than 5000 years ago, a date which falls within the estimated time range of the Hypsithermal interval (Reckendorf and Parsons 1966). Oak trees were at their maximum distribution in the Willamette Valley during the Hypsithermal (Detting 1968), and it seems likely that prehistoric peoples may have first begun to utilize this important food resource on a large scale at this time (Minor and Pecor 1977:109).

While none of these hypothetical examples of the proposed influence of climatic change on the cultures of prehistoric peoples is indisputable, future research of both a paleoclimatic (e.g., through pollen analysis) and an archaeological nature is necessary before archaeologists will be able to meaningfully relate changes in the lifeways of prehistoric cultures with changes in the natural environment.

5. Prehistoric Cultural Relations and Trade

Ethnographic research by Collins (1951:113-128) and Zenk (1976:45-53) seems to indicate that there was extensive contact between the Kalapuya of the Willamette Valley and aboriginal groups in neighboring areas. Of the archaeological sites so far investigated in the upper Willamette Valley, however, only two archaeological sites—the Fuller and Fanning Hounds on the South Yanhill River—contain an abundance of extra-valley contact elements. These two localities exhibit a number of traits, such as whalebone clubs, sea shells and human cranial deformation, which seem to indicate extensive contact with aboriginal populations living along the lower Columbia River and the Oregon Coast. In contrast, extra-valley traits appear to be only rarely represented at sites in the southern Willamette Valley.

How effective were the Cascade and Coast Ranges as cultural barriers in prehistoric times? How insulated from outside influences were the prehistoric populations of the Willamette Valley and the Oregon Coast? Is there a distinct difference in the material culture of populations inhabiting the northern and southern portions of the valley? Was there a sudden increase in extra-valley relations within the last 2,000 years as suggested by White (1975a:59-61)? Can the introduction of exotic items into the Willamette Valley be correlated with any other events (climatic change or population shifts) in the Pacific Northwest as a whole?

These questions can be approached in a number of ways. First, there is an obvious need for the excavation of additional sites in the northern Willamette Valley in order to provide a more reliable base of information from which comparisons can be made.

Second, the documentation, both from the literature and in the field, of aboriginal trails across the Cascade and Coast Ranges may provide some insight into the intensity and antiquity of trade and travel within the region. As pointed out by White (1975a:94-95), at least eleven major natural corridors may have been used by aboriginal peoples entering or leaving the northern Willamette Valley. No archaeological investigations have yet been conducted in these areas to determine the extent of their use as avenues of cultural contact between prehistoric peoples in the region.

In addition, the presence of obsidian artifacts in coastal and valley sites suggests that obsidian was a major item of trade in prehistoric times. Trace element analysis of obsidian samples from archaeological sites in northwestern Oregon has not been conducted to date. Such analysis has a high potential for providing information on interregional trade in aboriginal times.

ETHNOGRAPHY

As stated earlier, ethnographic information not only provides detailed data about observed cultural lifeways, but it allows inferences to be made about land-use patterns and artifacts of the more distant past. To date, however, this method of ethnographic analogy has not been utilized to its fullest potential by archaeologists in northwestern Oregon, either in the construction of a predictive model for site location or for interpretation of cultural resources.

One reason for this avoidance of ethnographic data may be the generally held belief that little appropriate material is available. While it is true that professional
anthropological field work post-dated Indian removal to reservations and that research
often tended to be linguistically oriented, the extensive literature search on which the
ethnographic section of this overview is based reveals that there is a considerable body
of information available which could greatly aid our understanding of aboriginal land
utilization practices, in addition to providing specific site location information which
could aid cultural resource management.

In addition to published ethnographic reports that are locally available, a sizable
body of unpublished manuscripts and field notes of early ethnographers is held in the
files of the National Archives, the Library of Congress, the Bureau of American Ethnology,
and the Jacob Collection at the University of Washington, among others. These ethnographic
resources often contain information about pertinent topics such as village locations, food
resources, trails and trade routes, as well as the motivational aspects of land-use
practices, which were beyond the scope of this overview. Despite the availability of this
resource material, there have been few attempts to synthesize the information relating to
land utilization practices, with the exceptions of Taylor (1974a, 1974b), Suphan (1974),
and Zenk (1976), the latter dealing principally with the natural resources which were
exploited. Each of these papers illustrates the potential benefits yet to be garnered from
additional ethnological and ethnographic investigation of the factors which contribute to
particular land-use practices and aboriginal subsistence-settlement patterns.

Another resource that generally receives scant attention by archaeologists is the
extensive collection of historic accounts by early explorers, fur traders, government
officials, and settlers who were in northwestern Oregon prior to the reservation period.
Whereas ethnographic accounts often rely on the information of individuals who may have
ever actually experienced the aboriginal land-use practices, or on the memory of an
individual years removed from those practices, the early historic records typically report
first-hand observations. While the early authors may have misunderstood the native intent
of actions, the basic locational information may often be regarded as factual.
Examination of these records is of specific land-use topics, such as the extent of field-
burning or the locations where Indians were observed collecting plant foods, could add a
considerable amount of information about specific site locations and help establish
actual patterns of seasonal transhumance or extent of catchment areas in relation to
village sites.

Besides the numerous published accounts of historic interest, additional unpublished
diaries, narratives, and transcribed oral traditions of local settlers may be found in
special collections, for example, at the Oregon Historical Society Library, in the Oregon
Collection at the University of Oregon Library, and at local museums. Photograph collec-
tions, which are another potential source of descriptive data placing cultural features,
sites, and objects within their cultural context, are also found in files at libraries and
museums in this area. Additional records of international explorers can be traced to
foreign or national libraries, such as the collection of Spanish materials held in the
Bancroft Library at the University of California, Berkeley.

While it is important that cultural lifeways be understood in the broad regional con-
text, the research topics presented below allow ethnological examination of existing
materials for either specific land parcels directly managed by the Salem District of the
Bureau of Land Management, or at the regional level. Additional topics related to land
utilization that could benefit from further ethnographic field work are also addressed.
Each proposed area for continued study should contribute significantly to the understand-
ing and successful management of cultural resources located within the Salem District. Since
professional ethnological and ethnographic investigation is a time-consuming task, budgetary
arrangement of time and finances should be initiated soon so that the results can be

1. Environmental Reconstruction

Land-use patterns must be assessed in terms of the environmental conditions which
existed at the time of exploitation. To understand the aboriginal patterns of land/
resource utilization, one must attempt a reconstruction of the northwestern Oregon environ-
ment prior to Euro-American influences, that is, before the native practice of annual field
burning in the Willamette Valley was curtailed, before the extensive wet prairie and small
lakes were drained to accommodate American farmers, before water diversion channels were
constructed at Willamette Falls, and before extensive clear-cutting of the Coast Range
forest resulted in erosional siltation and loss of fish spawning beds, particularly in
coastal streams. The presence of specific resources as well as the favorable areas of
exploitation cannot be evaluated solely by today's resource availability.
Early historic accounts are the principal sources of these data, particularly the journals of observant naturalists such as Lewis and Clark (Thwaites 1905), David Douglas (1914), and John Townsend (1905). Several historic-geographic studies have attempted to reconstruct vegetational patterns in the Willamette Valley, such as those of Habeck (1961) and Towle (1974). To date, however, similar research for other areas of northwestern Oregon has not been adequately essayed.

Regarding specific native land management practices, Boyd (n.d.) and others have drawn on early historic accounts in attempting to understand the Kalapuyan practice of burning the Willamette Valley prairie. Whether other riverine or coastal Indians in this area followed similar brush control methods is yet to be established. The management of the forest edge and understory could have figured prominently in the location of settlements and resource areas. In addition to field burning and the reported use of ash for tobacco cultivation, other purposeful aboriginal acts of environmental manipulation which altered the biological ecosystems and were beneficial to the inhabitants of the area need to be addressed.

2. Land Utilization-Settlement Patterns

Since information about specific site locations is scattered throughout both early historic and ethnographic accounts, a study directed towards locating and recording this data, then plotting each activity area, could provide a sizable body of information on which a predictive site model could be based. The following topics are provided as examples which could be addressed during ethnological investigation of existing pre-reservation accounts:

a. the location of villages, camp sites, or other specific activity areas (e.g., camas beds, spirit quest areas, mortuary sites);

b. the seasonality of use, if noted, at each reported site;

c. a descriptive account of the observed or recalled activities (including, for example, number of people involved, equipment used and methods employed);

d. the relative location of activity areas (e.g., fishing stations, gathering areas) to other villages or resource locales;

e. the resources collected, gathered, or obtained;

f. demographic data including the number of houses or families in a village and the arrangement or distribution of shelters;

g. the occurrence of intervillage gatherings, at which times material resources could be exchanged;

h. land areas that were not used, and the explanation for avoidance (e.g., fear of forest, distance from base camp);

i. reports of resource failure and the social or economic mechanisms countering this shortage (e.g., increased trade, use of "starvation foods" not normally used, movement beyond usual range);

j. additional resources utilized, but generally not reported in the ethnographic record.

This list could be considerably expanded to provide for additional data recovery beyond land-use questions. But for constructing a predictive model of area utilization, locating historically known sites that are on BLM lands, and assessing the significance of these resources, it is suggested that each specific activity area within the District be field checked by a professional archaeologist and appropriate site forms and documentation completed. This information would not only yield a body of specific site locations, easing further reconnaissance, but the present appearance of known sites could provide clues for locating and interpreting other sites during future field surveys.
3. Ethnobiology

To date, no comprehensive ethnobotany nor ethnozoology has been written for western Oregon Indians, yet the value and feasibility of such a project is readily apparent from Zenk’s (1976) Tualatin study. Knowledge of the floral and faunal species which were important to the former native occupants should contribute significantly to determining how the land in this region was utilized, what areas were most frequently visited, and perhaps those areas which were not used, thus further contributing to a predictive site model. Understanding the seasonal availability of each desired resource would further allow inferences to be made about possible patterns of seasonal transhumance and availability of needed resources within the catchment area of known village or camp sites.

Recent ethnobotanical investigations by Couture (1978) with Burns Northern Paiute informants in southeastern Oregon indicates that considerable information about utilization of plant resources for food, fiber, and medicinal purposes is not only still available, but that these resources are utilized to some extent today by Indian peoples, at least in that area. It is suggested that future ethnobiological study in northwestern Oregon be designed to incorporate interviews with Indians presently living within this study area, as well as documentary ethnological information.

4. Reservation Land-Use Patterns

Little is known about the land-use practices established by native peoples following their removal from aboriginal territories and cloistering with other Indian groups on the western reservations following the mid-1850s. While assimilation as well as significant inter-group exchange occurred with relative rapidity on the reservations, there are scarcely any available data on areas which became important sites of religious or economic value within the reservation boundaries. Since numerous parcels of the former reservations are now under jurisdiction of the BLM, a concerted effort should be made to learn of the physical structures and features (e.g., cemeteries, sacred areas) which have been and continue to be of significance to the Indian community. Because the reservation lifeways received little attention from anthropologists who were eager to record aboriginal cultural practices and linguistic information, these data now must be collected by direct communication with Indian representatives who have knowledge of these culturally important areas (cf. Indian Religious Freedom Act). Field documentation should be made at each of these locales so that appropriate protection can be assured.

In addition to the gathering of site data, ethnographic interviews could also gather information on reservation land-use practices. For example, such questions might be addressed as: How did resource utilization change during the reservation period? Were reservations lands utilized differently by various Indian peoples, and can specific groups be identified by the methods or tools they used, which may be found in these areas? Were particular areas of the reservation used exclusively by one group? Did certain aboriginal social and economic land pursuits continue into the reservation period and beyond?

HISTORY

The research and writing of the narrative historical overview and the preparation of the specific historic site inventories for the various Planning Units in the Salem BLM District suggest that several areas of the cultural resource inventory have been developed adequately so that several of the cultural resource mandates can be effectively carried out. To a large degree the deficiencies relate to the ability of the District to develop balanced and well documented inventories so that the assessment of significance of historic sites can be made and so that, in future program development, interpretation can occur. Of importance in developing a better understanding of human activities on BLM lands in the historic period are the following research projects:

1. Livestock Grazing Practices

Present information suggests that residents of the Willamette Valley and its surrounding feeder stream bottomlands may have made extensive use of the public domain for grazing of livestock. The production of wool, sale of beef cattle, and other "range" activities likely occurred on lands which are today administered by the BLM. This topic is woefully lacking in discussion in the published literature on its implications and the impacts, for example, of such statutes as the Taylor Grazing Act need to be identified and assessed.
2. Water Transportation and Logging

Log transportation has been and continues to be a fundamental part of the timber industry. Information in the compiled inventories of the various Planning Units and historical publications both suggest that logging railroads played a very important part in that enterprise during the first four decades of the twentieth century. A topic almost entirely omitted in these discussions, however, is the use of the rivers in log transportation. So significant did water transport become that under the Log Boom Act of 1917 the Oregon Legislature required that any company seeking to use the public waterways had to seek a franchise from the Public Utility Commission. An appropriate subject of research would be the probable use of splash dams and other modes of water transportation of logs in the Salem District.

3. Logging Communities

Logging has occurred in many places on public lands administered by the BLM or upon tracts immediately adjacent to BLM properties. Commencing in the nineteenth century and lasting until the period immediately after World War II, a common feature of logging was the presence of a "camp," the community in which the loggers and sometimes their families resided. These sites all need historical documentation, on-site examination, and assessment in terms of historic archaeology. Some locations--such as the townsite or logging camp of Palmer, Oregon, owned by the Bridal Veil Lumber Company--vanished in a matter of hours in forest fires. The potential for recovery of information at a number of these locations might be rather good.

4. Impacts of Public Land Laws

The development of interpretive programs in the various Planning Units could appropriately touch upon subjects such as the impact of public land law in this special area. Of all the public laws affecting the rural lands and the development of western Oregon, two appear to stand out: the Homestead Act of 1862 and the reversion of the Oregon and California Railroad grant lands. Both of these subjects deserve closer research so that specific information about the impacts of these measures can be provided to the general public. Especially important is the extent to which the O & C revenues have been used by the various counties to fund governmental activities.

5. Depression-Era Activities

A substantial portion of the cultural resource sites currently being recorded in the BLM Salem District are Depression-era homesteads and squatter’s cabins. During the same period, several trails, roads, and lookouts in the BLM Salem District were built by CCC. A worthwhile topic for future research could be the documentation of the effect that deteriorating economic conditions had on the use and settlement of public lands in this region during the 1930s. As part of this study the history of CCC activities should be examined for the role this program played in facilitating settlement (through increased access) and providing local employment.

6. Documentation of Site Significance

Future research should be concerned with developing additional data about known sites so that the levels of significance can be more clearly determined. The growing Statewide Inventory in the State Historic Preservation Office may serve as a measuring stick for the identification of "uniqueness" of sites on BLM lands. The use of manuscript as well as published sources will enhance the ability of the cultural resource staff to secure "solid" data on sites. Of value may be some unexplored data such as county survey maps, additional intercensal records (maintained by the state on economic activities) than those employed in this overview, and other materials housed in the various courthouses, libraries, and local museums in the Salem BLM District.
FUTURE MANAGEMENT OPTIONS

The current emphasis on regional approaches to cultural resource management places a heavy responsibility on federal land management agencies to protect a broad spectrum of cultural resources on the lands under their control. All federal agencies are required by federal law to inventory, protect, and enhance resources of archaeological and historical significance on lands under their management. The rationale for these protective laws is that cultural resources are non-renewable; once they are destroyed, the information pertaining to particular historic or prehistoric structures, sites, districts or objects is lost forever. Due to the non-renewable nature of cultural resources, the federal government has passed legislation directed toward protecting and exploiting these resources to the maximum public interest. The Bureau of Land Management, like other federal agencies, is directed by federal law as follows:

1) Executive Order 11993 of May 13, 1971, directs federal agencies to survey their lands and nominate to the National Register of Historic Places significant historic and archaeological sites on federal properties. The Federal Land Policy and Management Act of 1976 further requires that the Bureau of Land Management be responsible for preparing and maintaining "on a continuous basis an inventory of all public lands and their resources and other values including cultural resource..." Both laws require that a systematic inventory of federal lands be made in order to locate, protect, and enhance significant cultural resources.

2) Several recent laws, including the National Historic Preservation Act of 1966 and the National Environmental Policy Act of 1969, require federal agencies to consider the impact of their proposed activities on cultural resources and to refrain from damaging or destroying significant historic or archaeological resources on their lands. This legislation also applies to the impact of federally-funded programs on cultural resources situated on non-federally owned lands.

3) The passage of the most recent legislation--Public Law 96-95--has emphasized the ultimate intent of all antiques legislation, which is "to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands..." (Section 2.b).

At the time of this writing the Salem District of the Bureau of Land Management has made commendable progress toward compliance with federal policies regarding cultural resources. A full-time Cultural Resource Specialist has been employed by the Salem District for several years, and a number of archaeological and historic sites have been recorded within the region by Bureau employees.

The location of the scattered Bureau lands in the steep and heavily forested terrain of northwestern Oregon creates complex problems in identifying and managing cultural resources in the Salem District. The remainder of the Cultural Resource Overview discusses some of the issues and problems involved and presents some recommendations for the future management of the Salem District's cultural resources. Recommendations for the management of specific archaeological and historic sites are presented in the companion inventory volume accompanying this Cultural Resource Overview.

Recommendation 1: The Salem District should establish a multi-stage survey program to broaden the cultural resource data base required for administrative planning purposes.

As described in previous sections of this overview and in the accompanying inventory volume, archaeological and historic sites now known to exist in the Salem District occur in several characteristic geographical locations. Due to the relatively unsystematic manner in which the existing site inventory has been amassed, however, it is not known whether the types of locations so far identified as high probability areas are in fact the only ones in which sites occur. A more adequate resource inventory, based on a larger and more controlled sample of sites, is essential to establish a reliable means of predicting site locations.

1c. In order to accomplish this objective, it is necessary to establish a program of cultural resource survey incorporating the following five survey approaches:

1) clearance of specific ground-disturbing projects. Surveys preceding ground-disturbing activities are required by federal regulations and are being conducted on a continuing basis by Salem BLM District personnel. These surveys are of the most immediate concern to the Bureau of Land Management, but can make only limited contributions toward developing the known cultural resource inventory.
(2) follow-up surveys of ground-disturbing projects. Because of the heavy vegetation cover in much of the region, discovery of archaeological sites and some historic remains are greatly hampered. The re-surveying of areas exposed during ground-disturbing projects is a means of discovering sites when they are most visible. To be effective, re-surveys should be done within a year of the initial ground disturbance before the ground surface is again overgrown and obscured. The technique of follow-up survey is particularly important for those areas which will be subjected to repeated disturbance (e.g., periodic logging) over the years.

(3) surveys in areas where there is a high potential for damage to cultural resources. These areas include those localities easily accessible to the public, such as along highways and dirt roads, near recreational vehicle spots, etc. Also included are those areas subject to a high degree of erosion, such as major river and stream banks. These kinds of surveys have not yet been undertaken in the Salem District, and steps should be taken to begin such surveys immediately. These surveys will typically cover more extensive areas than specific project clearance surveys, and will provide a correspondingly greater amount of information on the cultural resources of the district.

(4) judgmental surveys of likely site areas. The most cost-effective way of broadening the known site data base is to conduct "intuitive" surveys in areas considered to be most likely to yield sites. Such areas include those with relatively high surface visibility, areas with less than 30 percent slope, river terraces, natural barriers to anomalous fish, saddles in ridgelines, prominent peaks, ridgetops, and meadows. Some of these areas can rather easily be selected with the aid of aerial photographs and topographic maps (e.g., Alkens et al. n.d.). Surveys of unpaved logging roads can also be a quick but effective means of adding to the site inventory.

(5) large-scale, systematic surveys on remaining Bureau lands. The BLM has already begun initiating surveys of this nature (Class II Inventories) in Oregon. Although recent Class II Inventories in the Eugene and Roseburg BLM Districts of western Oregon (Baxter and Willingham 1980; Connolly and Willingham 1980) were not productive in terms of recording a large number of cultural resource sites, systematic intensive surveys in forested environments can be successful (e.g., Lovis 1976; Spurling 1979) and should continue to be undertaken. These surveys must be based on a well-conceived research design and should be conducted in areas representative of the various environments found in the district.

Although Class II Inventories are not as cost-effective as the surveys of (2), (3) or (4) above, such studies are eventually required because they should produce more unbiased information on land use patterns over a range of environmental types, some of which will not be covered under the other survey approaches. It is strongly suggested, however, that "opportunistic" surveys, such as those in (2) and (3), and "judgmental" surveys, such as those in (4), precede the undertaking of Class II Inventories in the district. These types of surveys will contribute valuable, though biased, information which can aid in the initial selection of a Class II study area, in the development of a suitable research design, and in the development of stratified sampling schemes for a particular study area within the district. The completion of subsequent Class II Inventories should provide in turn a fuller interpretive framework for sites recorded during all types of surveys.

It is also suggested that systematic surveys be designed to cover a high proportion (at least 25 to 50 percent or more) of a small study area, rather than a highly dispersed sample of a very large area. In an area which poses many problems for site discovery, a highly concentrated study of a single river valley or ridge system, for example, should be able to contribute more to our understanding of land use patterns than a far-flung but light sampling of a number of potentially diverse valley or ridge systems. Potential themes for structuring Class II Inventories are addressed in the section on future research directions.

Intensive, systematic studies in the Salem District will require the development of a research methodology specifically geared to discovering cultural resources in forested terrain. Ground sampling in heavily forested areas cannot be effective without subsurface sampling. Because this approach generally entails what is known as "point sampling" (Nance 1979), ground survey methods should concentrate on exposing the ground surface to the maximum degree possible (Lovis 1976; Spurling 1979). In order to make the Class II Inventory effective in the Salem District, the BLM should anticipate, and make provisions for, the time and expense involved in carrying out subsurface testing during forest surveys.

In recent years, the BLM should maintain a flexible policy regarding the collection of artifacts during cultural resource surveys on land under its jurisdiction (BLM Manual, Section 811.318). The purpose
of this policy is well-intentioned, as it aims to preserve site integrity. To the maximum extent possible, sites should be located, protected and left undisturbed.

It has been recently pointed out by Butler (1979), however, that a stringent no-collection policy contributes to the irretrievable loss of data rather than to its preservation. Information contained in cultural resource sites can be preserved in situ, but it can be more effectively preserved through carefully controlled, systematic collections. This is especially true in western Oregon, where most sites have been disturbed to at least some extent and face a high risk of further attrition. (For a recent discussion of archaeological site disturbance processes, see Wood and Johnson 1978.)

Small sites and isolated finds, in particular, are often very difficult or impossible to relocate in the forests. In order to be able to effectively add the information contained in these finds to the known data base for future use, some collection of temporally and functionally diagnostic specimens will be necessary. It frequently takes much more time to properly photograph, sketch and thoroughly describe artifacts in the field than it does to make a controlled collection for laboratory analysis and curation. Uncollected specimens have the added disadvantage of not being available for later comparative study or lithic sourcing analyses.

It should be stressed that any collection of artifacts, for whatever purpose, should be systematic, controlled and carefully carried out. After study, all cultural materials should be deposited at the Oregon State Museum of Anthropology at the University of Oregon, which is designated by Oregon law (ORS 352.090) as the official state repository for antiquities, to be available for future study.

3C. Reports of cultural resource survey projects and the results of any archaeological salvage fieldwork or historical research undertaken within the Salem District should be distributed in a technical publication.

BLM lands in Oregon contain cultural resources which are of more than just local importance. They have produced information on past lifeways which is relevant to the studies of archaeologists, ethnographers, historians, and others all over North America. The results of fieldwork involving cultural resources in this area should be made available to any interested members of the academic community. Probably the most efficient means of accomplishing this objective is to establish a technical series for distributing these reports. The Nevada Bureau of Land Management has recently initiated a series called "Contributions to the Study of Cultural Resources" which could be emulated as a model for the efficient, low-cost reproduction of cultural resource reports.

Because most reports intended for a professional audience may contain technical data, reports of this nature will probably be of limited interest to the public. Some other means of conveying important new information on cultural resources to the general public should be used (see Recommendation 5).

Recommendation 2: The standard BLM policy for assessing the significance of cultural resources should be developed into an explicit framework for the region and continually updated for the assessment of cultural resources on lands within the Salem District.

Assessment of the significance of cultural resources is undoubtedly the most difficult task facing those involved in cultural resource management. A sound approach to the assessment of significance is crucial for the successful management of cultural resources, because an evaluation of "significance" determines the ultimate disposition of the resources (Raab and Klinger 1971:530). The BLM has been assigned the responsibility of developing and carrying out a long-range program for preserving a representative sample of cultural resource sites for the future. The immediate, as well as long-range, management needs of the BLM require that the significance of each cultural resource site be assessed in some manner.

Procedures for evaluating cultural resources in terms of the actual or potential manner in which cultural resource sites or properties may be used have been recently set forth by the BLM in the Cultural Resource Evaluation Guidelines. These general guidelines view the evaluation of cultural resources in terms of the following use categories:

1. Socio-Cultural Use
2. Current Scientific Use
3. Management Use
4. Conservation for Future Use
5. Potential Scientific Use
Although the above categories provide some indication of the potential uses of a particular cultural resource, they are only a means for categorizing the potential of a resource and do not provide specific guidelines for assessment within each category.

There is no widespread consensus of what constitutes the proper specific guidelines for resource assessment, but most researchers involved in the evaluation of cultural resources would agree that certain topics should be considered. The following general concerns, as suggested by Glassow and others (1976), should be specifically addressed, with varying emphases, in developing a more explicit evaluation framework for the Salem BLM District's cultural resources:

1. geographic location and physical setting of resources (how typical or unique is the setting? What is the relationship of the location to human activities [e.g., fishing, gathering, habitation]?)

2. physical characteristics of the resources (What is the extent of each resource? Can the stratigraphy be discerned? Are the cultural components distinct? Is it likely that activity patterns can be delineated?)

3. temporal distinctiveness (Can the site be dated by any means, such as radiocarbon dating or temporally distinct artifacts [e.g., projectile points]? Does the site date from a period about which little is known?)

4. range and nature of activities represented by the resources (What kinds of activities are in evidence at the site? Is there a broad range of activities or is it a limited activity site? What is the association of the activities to the geographic setting? What tools and materials are representative of the various site activities?)

5. state of preservation (What kinds of impacts have affected the site? What is the extent of existing impacts at the site? What is the potential for site preservation?)

6. significance to local populations (Does the site have significance for contemporary ethnic groups, the local public or any special interest groups?)

It must be stressed that cultural resources must be assessed in a relative rather than an absolute basis. In reality, the potential value of any two cultural resource sites is rarely the same. In many cases, any one factor (such as temporal data, the nature of activities, or significance to contemporary populations) may outweigh others for the purpose of assessing the significance of a particular site. There is no simple formula for evaluating site significance.

The problem of assessing resource significance has been widely discussed and debated (for recent reviews, see House and Schiffer 1975; Raab and Klinger 1977, 1979; Moratto and Kelly 1978; and Sharrock and Grayson 1979). It is agreed that there are many standards of significance applicable to cultural resources. Moratto and Kelly (1978) suggest that multiple scales of different criteria, such as those listed above, apply in any evaluation of cultural resources in attempting to assign relative values of significance. It is now clear that simple checklists or cumulative measures, where sites are evaluated merely on the potential quantity of information or number of techniques which can be applied to a resource, fail to take the complexity of assessing a site's potential significance into account, as set forth by Moratto and Kelly (1978:23-24):

The concept of significance is so complex that a formulated or cookbook approach to resource assessment is out of the question. There can be no substitute for professional expertise in determining significance and designing actions based on significance. Beyond professional competency, the archaeologist must have adequate information (such as data from test excavations) about the property being evaluated. In most cases, both regional and site-specific research designs will provide the necessary framework for evaluating significance, and many assessments will be interdisciplinary efforts.

Raab and Klinger have recently pointed out that cultural resource significance is "a dynamic phenomenon that will change with advances in archaeological method and theory" (1977:632). Significance will also change as the known data base for a region evolves with time. With this in mind, cultural resource significance should be assessed within a regional framework in relation to "explicit, problem-oriented research designs" (Raab and Klinger 1977:632).

The first steps toward developing a regional framework for the Salem District are suggested in the previous section on future research directions. These research foci must be melded with the existing data inventory, further developed, tried and modified.
Site significance and associated management actions (such as preservation of selected sites) must be reviewed and reassessed within the developing regional framework as the known data base for the Salem District becomes broader with the addition of new information.

Recommendation 3: Studies of the various kinds of impacts affecting archaeological and historical sites should be made in order to obtain information to be considered in decision-making. The short-term management of cultural resources.

In order to make proper management decisions regarding cultural resources, the Bureau of Land Management must be aware of and actively gather facts on the following:

1. various activities or forces which may alter the integrity of a site;
2. the effects of such impacts; and
3. measures which may effectively mitigate the various impacts.

Until recently, little attention has been focused on the assessment of impacts affecting the cultural resource data base. To date, no such experimental research has been undertaken by the BLM in Oregon. The resource management studies by Chance (1968) and Aikens (1976), based on cursory field observations, indicate the kinds of impacts which may be expected within the Salem District, and the measures which may be taken to protect cultural resources from these impacts. The major classes of potential impacts are mentioned briefly below.

The first type of impact is the result of natural processes, such as wind and water erosion. Because of the low visibility of the cultural resource sites in northwestern Oregon, most are not located until they have been exposed by logging and other project activities, the effects of which are usually amplified by erosion and other natural forces. Prior to their discovery, however, almost all known sites have been affected to some extent by natural attrition (see Wood and Johnson 1976).

The second kind of impact includes the effects of all projects which alter the surface of the land to any extent. Ground-disturbing activities which may destroy cultural resources include the following: logging, pipeline and powerline construction, road construction, off-road vehicle use, plowing, spring developments, and reservoir construction. Since much archaeological information can be gathered from the patterning of cultural debris on the surface as well as within the ground, disturbance of only the surface of a site still results in a significant loss of information.

The third type of impact is created by the activity of vandals and collectors on Bureau-managed lands. Vandalism of sites by individuals who surface collect or excavate for artifacts in violation of the Federal Antiquities Act of 1906 and the Archaeological Resources Protection Act of 1979 has occurred in the past within the Salem District. While such activities do not present the greatest threat to cultural resources in the district, they do constitute a significant impact on both historic and aboriginal sites.

It is widely acknowledged that any impacts involving disturbance of the archaeological matrix result in a significant loss of information from cultural resource sites. Ground disturbing activities can obliterate the fragile patterning of archaeological remains, the distribution of which can yield data on the particular behavioral activities that occurred at a site at any given point in time (e.g., Bineford et al. 1970; Smith 1978). In order to properly interpret the remains of cultural resource sites, it is important to determine how and to what extent various types of disturbance activities affect sites. Studies of site impacts are clearly necessary in order to make informed decisions concerning the best ways of minimizing impacts and protecting cultural resource sites.

Recommendation 4: The Salem District should establish a protection and mitigation program for sites affected by negative impacts.

There is no question that the cultural resources of the Salem District are subject to the various kinds of impacts mentioned above. As part of its regular cultural resource management program, the BLM in many cases is already attempting to mitigate the impact of natural, and also project-related, impacts. It is sufficient here simply to stress that a site must not automatically be considered insignificant if a portion of it is disturbed in some way; such a decision must be left to the judgment of a qualified archaeologist or historian who is familiar with the region's known resources. Also, since not all sites are visible from the surface, it is advised that a professional archaeologist be on hand during project operations in suspected site areas if sub-surface disturbance of these areas is involved. Specific mitigation measures for project disturbance are discussed by Chance (1958), Lipe (1974), and Aikens (1975).
4A. A wide range of protective measures are available and should be implemented for alleviating site impacts. The effects of human impacts on some sites may be lessened by avoidance of site areas or by blocking vehicular traffic in sensitive areas. Interpretive signs may be posted to explain the importance of a particular site and cultural resources in general. Steps should also be taken to control erosion at those sites which are deteriorating as a result of natural processes.

Historical sites and structures can, in some cases, be stabilized or reconstructed in their original locations or can be moved to a more protected area. Reconstructed sites should be maintained for the public's interest and should be posted with interpretive signs. Historic areas may be better maintained by cleaning underbrush and dead wood away from structures, trails and roads, thereby reducing the potential fire hazard. Architectural and archaeological investigations should be considered for historic sites and structures which cannot be preserved or protected. As a minimum, photodocumentation and architectural sketches should be made of all historically significant structures encountered on BLM lands.

Although site data is best protected by in situ site preservation, another important form of preservation is through controlled data retrieval and analysis. A minimum amount of information must be recovered from all archaeological sites on BLM lands which cannot be protected from ongoing or foreseeable impacts. Minimal measures should include controlled surface collections, excavation of one or more units to test sub-surface deposits, basic analysis and reporting of the recovered cultural materials, and storage of all materials at the state repository for future use (e.g., for sourcing analysis and other analytical studies).

4B. In addition to unintentional but negative impacts caused by activities approved by the BLM or by the forces of nature, sites may occasionally be partially or completely destroyed by relic collectors. Short-term solutions to the vandalism of cultural resources on BLM lands include posting signs warning people of the illegal nature of artifact collecting on federal lands, surveillance by knowledgeable BLM employees, backfilling and seeding sites excavated by amateurs, and prosecution of violators under the law. In the latter respect, it is noteworthy that attempts have already been made to prosecute violators of federal antiquities laws on lands within the Lakeview BLM District (Grayson 1976). Relic collectors have been successfully prosecuted by the Medford BLM District as well.

4C. The utility of disturbed archaeological sites has been recognized only relatively recently (e.g., Talmage et al. 1977). Although an unknown quantity of information is lost when a site is impacted, a disturbed site may still provide a range of important, basic information. Studies of disturbed sites are particularly valuable in areas where few undisturbed sites are known to exist, such as in northwestern Oregon.

Minimal information which can be retrieved from a disturbed site includes the basic nature of the cultural materials present at the site and the activities represented by the preserved materials (e.g., plant processing, cooking, extended habitation, hunting, specific lithic manufacturing activities, etc.). The data regarding general site function can still be interpreted even if the data matrix is not intact. Although the loss of provenience data will probably not allow temporal ordering of assemblages within an impacted site, the minimal dating ranges of disturbed assemblages may still be obtained from temporally diagnostic specimens (if they are present), such as projectile points. Trace element studies of obsidian and cryptocrystalline specimens from a disturbed site can determine the ultimate source of these materials, and can contribute to our knowledge of trade routes and exchange systems. Systematic collections from the site will allow further analyses of the cultural materials which in turn will provide further information on activities carried out at the site. In addition to providing specific information on the effects of various site impacts for management purposes as well as data on the composition and use of sites, impacted sites also play an integral part in developing a regional predictive model of human land use. By recording the locations of disturbed sites in relation to their associated environmental variables, the patterning of site locations can be observed; this will provide land managers with a clearer picture of where sites are likely to be found in the future. No disturbed site can be written off as useless.

4D. Since cultural resources are known to be frequently altered, and sometimes totally destroyed as a result of the impacts described above, it is strongly recommended that the Salem District develop a standing capability to conduct emergency operations to salvage information from archaeological and historic sites threatened with destruction. In theory, the salvage of cultural resources should be viewed as a last resort to be implemented only when all other attempts to mitigate impacts upon them have been exhausted. Realistically, however, it is simply impossible to avoid damage to cultural resources in every situation.
As a result of this situation, it is strongly recommended that the Salem District create a reserve fund on a year-by-year basis which can be used in support of salvage operations. This fund would be used to contract with universities or professional research firms to conduct fieldwork at threatened sites on an emergency short-term basis. The salvage of threatened sites cannot wait several months or even years for funds to be allocated for this purpose through normal government procedures. The need for such a fund is underscored by the fact that some cultural resource sites where salvage operations should be conducted are already known to exist, as indicated in the inventory volume accompanying this cultural resource overview.

Recommendation 5: In an effort to communicate the importance of cultural resources, active attempts must be made to publicize both the results of BLM-sponsored CRM research and the management responsibilities of the Bureau concerning cultural resources so that such resources may be better appreciated and understood by the general public.

Although the importance of cultural resources and their management has long been recognized by archeologists, historians, legislators in Washington, D.C., and a few other interested parties, very little has been done to demonstrate the impact and relevance of cultural resources to the general public. It is strongly recommended that the following steps be taken by the BLM to share with the public some of the more significant resources which are located within the study area. It is only by actively encouraging an appreciation for and understanding of the use and long-term significance of cultural sites and materials that the Bureau will gain public cooperation in the management and protection of cultural resources.

5A. Special attention should be given to those members of the public residing within the Salem District. In order to help make people aware that cultural resources in their immediate vicinity are important and are worth protection or mitigation, the following courses of action should be considered:

1. Archaeological and/or historical interpretative displays. Such displays would ideally concern cultural resources in the immediate area of the communities in which they were placed and could be developed for placement in local community centers, town or city halls, schools, and museums.

2. Publications on archaeological and/or historical resources in the region which would be of interest to the public. These publications could take the form of pamphlets or books and could cover a wide range of information stressing the significance of the resources and the BLM's responsibility in protecting and managing these resources. The publication of this overview in some form for widespread distribution is one such possibility. Contracting firms, whether university or private, could be required to produce a short report or essay suitable for the public. The Salem District could then issue periodical collections of these essays to be made available for sale at local outlets, including museums and city halls, as well as at the BLM offices.

5B. Members of the public who do not reside within the study area but who may travel and spend time within the district should also be a concern of the BLM as they may also have an impact upon cultural resources in the region. The means are the same as those mentioned in 5A above. The only difference to be noted is that displays, pamphlets, and publications should be placed in areas frequented by travelers such as information centers, recreation sites, city halls, and museums.

In order to reach people statewide, the Bureau should consider a BLM-sponsored pamphlet illustrating "Archaeology in Oregon" and "Historical Places (or Sites) in Oregon" for distribution throughout the state. An excellent example of such a pamphlet has been put out by the archaeology of Washington State by the Office of Archaeology and Historic Preservation in Olympia, Washington. It is also suggested that museums and other BLM offices outside the Salem District be utilized for the further distribution of suggested publications. Publications and displays might stress the illegal nature of collecting cultural resources and punitive measures which may follow, in conjunction with discussing the need for protecting cultural resources and the management responsibilities of the BLM.

5C. BLM employees who are not directly concerned with cultural resource management should also be better informed with regard to the import of cultural resources. Well-informed BLM employees may then aid in the protection of cultural resources by reporting any historic or aboriginal cultural items, such as arrow points and old bottles, encountered in the performance of duties not related to cultural resources. Displays in BLM offices, assembled with the cooperation of universities and museums, may serve to educate the public as well as BLM employees. Publication and distribution of pamphlets and larger volumes such as this overview are urged as another way of reaching BLM employees as well as the public.
It is further suggested that the Bureau implement an internship program through one or more state universities (as mentioned in Recommendation 6) to be concerned in part with the public relations aspects of the BLM, including setting up and updating displays, speaking and giving demonstrations at local schools, and researching and writing pamphlets and other publications.

Recommendation 6: The Salem District should continue to employ additional personnel in its cultural resource management program.

Each resource (timber, wildlife, recreation, etc.) on lands administered by the Bureau of Land Management has its own management program on the district level. Because a concern for cultural resources has only come about as a result of recent federal legislation, however, the program for managing cultural resources tends to be somewhat underdeveloped in comparison with other resource management programs.

The management of cultural resources basically consists of four activities: (1) specific project clearance—insuring that BLM projects will not harm cultural resources; (2) additional follow-up and broad scale inventories of BLM lands; (3) surveillance of cultural resources on BLM lands to protect them from destruction; and (4) educating the public, and also other BLM employees, as to the value of cultural resources and the need to preserve them from destruction. Because the cultural resource management program of the BLM is a relatively new one, the one Cultural Resource Specialist for the Salem District spends the great majority of his time on specific project clearances and necessary office matters. This leaves almost no time for additional needed surveys, surveillance or educational work required for a successful cultural resource management program.

As a result of this situation, it is recommended that the Salem District consider hiring additional personnel to assist the Cultural Resource Specialist in the performance of this work, as has been done in the past. Probably the most desirable option would be to hire temporary professional help for this purpose. Individuals with strong backgrounds in history or archaeology should be hired depending on the immediate needs of the district.

Another way of increasing the number of personnel involved in cultural resource management in the Salem District would be to develop an intern program for students from colleges and universities in Oregon. These students could obtain academic credit for training in cultural resource management while working with the district's Cultural Resource Specialist. The Oregon State Historic Preservation Office has conducted a successful student intern program of this sort for the last several years.

***

In conclusion, this cultural resource overview is intended to provide a baseline from which the Salem District's resource management program may further develop. Further steps, as outlined above, remain to be implemented to better manage and protect cultural resources within the Salem District. The close cooperation between BLM personnel at all administrative levels and the professional archaeological and historical community will ensure the success of an effective management program for the study area.
INTRODUCTION

Beckham, Stephen Dow

Cole, David L., in collaboration with Harvey S. Rice

Collins, Lloyd R.

Cressman, L. S.

Cressman, L. S. and W. S. Laughlin

Davis, Wilbur A.

Decker, Doyle D. and Wilbur A. Davis

Jacobs, Melville

Laughlin, William S.


Newman, Thomas H.

Rambo, Sandra Lee

Ray, Verne F.

Ross, Richard E.

Ross, Richard E. and Sandra L. Snyder

Shiner, Joel L.
1949 Appraisal of the Archaeological Resources of Twelve Reservoirs in the Willamette Valley, Oregon. Smithsonian Institution, River Basin Surveys, Columbia Basin Project.

Suphan, Robert J.
White, John R.  
1974  

Woodward, John A.  
1974  

ENVIRONMENT

Antevs, Ernst  
1948  

Aschmann, Homer  
1958  

Baldwin, Ewart M.  
1964  

Balster, C. A. and R. B. Parsons  
1968  
Geomorphology and Soils, Willamette Valley, Oregon. Agricultural Experiment Station, Special Report 265. Corvallis.

Baumhoff, Martin A. and Robert F. Keizer  
1965  

Bond, Carl E.  
1973  

Boyd, Robert  
1964  

Bryan, Alan L. and Ruth Gruhn  
1964  

Burt, William Henry and Richard Philip Grossenheimer  
1964  

Collins, Lloyd R.  
1951  

Detling, LeRoy E.  
1968  

Dicken, Samuel N.  
1965  

Dicken, Samuel N. and Emily F. Dicken  
1979  

Franklin, Jerry F. and C. T. Byrness  
1973  

Grayson, Donald K.  
1976  
Hanson, Henry F.  

Ingles, Lloyd G.  

Kroeber, A. L.  

Loy, William G., Stuart Allen, Clifton F. Patton, and Robert D. Plank  

McKee, Bates  

Mehringer, Peter J. Jr.  

Minor, Rick, Stephen Dow Beckham, and Kathryn Anne Toepel  

O'Connell, J. and P. S. Hayward  

O'Connell, J. and J. E. Ericson  

Peterson, Roger Tory  

Towle, Jerry C.  

Walters, Heinrich  

White, John R.  

Zenk, Henry B.  
Alley, Steven

Baldwin, Ewart M.

Barnett, H. G.

Bense, J. A.

Brown, Lionel A.

Bryan, Alan L.
1957 Results and Interpretations of Recent Archaeological Research in Western Washington with Circum-Boreal Implications. Davidson Journal of Anthropology 3:1-16.


Bryant, Richard L., Leslie Conton, Robert E. Hurlbett, and John R. Nelson

Butler, B. Robert


1963 Further Notes on the Burials and Physical Stratigraphy at the Congdon Site, a Multi-Component Middle Period Site at The Dalles on the Lower Columbia. Tebwa 6(2):16-32.


Caldwell, Warren W.
1956 The Archaeology of Wakemap, a Stratified Site near The Dalles of the Columbia. Ph.D. Dissertation, Department of Anthropology, University of Washington, Seattle.


Cole, David L.

1968 Archaeology of the Fall Creek Dam Reservoir. Report of the Museum of Natural History, University of Oregon, to the National Park Service. Eugene.


Cole, David L., in collaboration with Harvey S. Rice

Cole, David L. and Michael D. Southard

Collins, Lloyd R.


Cordell, Linda S.


Coues, Elliot

Cressman, Luther S.


Cressman, L. S.

Cressman, Luther S. in collaboration with David L. Cole, Wilbur A. Davis, Thomas A. Newman and Daniel J. Scheans

Cressman, Luther S. and R. V. Emmons

Cressman, L. S. and W. S. Laughlin

Davis, Wilbur A.


Davis, Wilbur A., C. Melvin Alkens, and Otto E. Henrikson

Decker, Doyle D. and Wilbur A. Davis

Delling, LeRoy E.

Dicken, Samuel N., Carl L. Johannesson and Bill Hanneson

Dodge, James

Draws, Robin
1938 Cultural Sequences in the Middle Columbia Region. Honors Thesis, Department of Anthropology, University of Oregon. Eugene.

Drucker, Philip


Dunnell, Robert C. and S. K. Campbell

Dunnell, Robert C., James C. Chatters, and L. V. Salo

Dunnell, Robert C. and Dennis E. Lewarch


Dunnell, Robert C., D. E. Lewarch and S. K. Campbell

Dunnell, Robert C. and Robert G. Whitlam

Follansbee, Julie A.

Garner, James C.

Gehr, Keith D.

Grayson, Donald K.

Hansen, Henry P.


Hansen, Henry P. and I. S. Allison

Hansen, Henry P. and E. L. Packard

Haynes, C. Vance

Henn, Winfield
Heusser, Calvin J.  

Jacobs, Melville, Albert S. Gatschet and Leo J. Frachtenberg  


Kent, Ronald  

Kidd, R. S.  

Kittlemen, Laurence R.  

Krieger, Herbert W.  

Kroeber, A. L.  

Laughlin, William S.  


Leonhardt, Frank C. and David G. Rice  

Lewarch, Dennis E. and K. J. Reynolds  

Lowry, H. D. and E. M. Baldwin  

Miller, Floyd E.  


Minor, Rick  

Minor, Rick and Audrey Frances Pecor  
Minor, Rick and Kathryn Anne Toepel  


Murdy, Carson N. and Walter J. Wentz  

Nelson, Charles M.  

Newman, Thomas M.  


Olsen, Thomas L.  

Oman, Mary and Mike Reagan  

Osborne, Douglas  

Pettigrew, Richard M.  


Phebus, George E.  

Phebus, George and Robert M. Drucker  


Rambo, Sandra Lee  
Reckendorf, Frank F. and Roger B. Parsons

Ross, Richard E.


Ross, Richard E. and Sandra L. Snyder

Sanford, Patricia R.

Shepard, Francis P.

Shiner, Joel L.

1953 Excavations at Site 35WSS on the Columbia River, Oregon. Smithsonian Institution, River Basin Surveys, Columbia Basin Project.

Sprague, Roderick

Steward, Julian H.


Strong, William Duncan and W. Egbert Schenck

Strong, William Duncan, W. Egbert Schenck, and Julian H. Steward

Towle, Jerry G.

Tuohy, Donald R. and Alan L. Bryan

Valley, Derek R.

Warner, George and Irene Warner
Warren, Claude N.  


Weld, Willi  

White, John R.  


Woodward, John A.  


Woodward, John and Dale Archibald  

Woodward, John A., Carson N. Murdy, and Franklin Young  

Wormington, H. M.  

Zenk, Henry B.  

Zontek, Terry  
ETHNOGRAPHY

Bancroft, Hubert Howe

Barnett, H. G.

Barry, J. Neilson

Beckham, Stephen Dow

Berreman, Joel

Bishop, Charles

Blanchet, Francis N.

Beas, Franz

Bolt, John
Bojorcas, Robert, Robert Coiner, Dennis DeGross, and others

Boyd, Robert


Brackenridge, Charles

Bulmer, Thomas C.
n.d.  Manuscripts on the Chinook Jargon Language, including grammar and dictionaries, prayers, hymns, songs in Chinook Jargon.

Bureau of Indian Affairs

Burnett, P. H.
1904  Recollections and Opinions of an Old Pioneer. Oregon Historical Quarterly 5:64-99; 139-198; 272-305; 370-401.

Clark, Robert C.

Clarke, Samuel

Coan, C. F.


Collins, Lloyd R.
1951  The Cultural Position of the Kalapuya in the Pacific Northwest. MS Thesis, Department of Anthropology, University of Oregon.

Confederated Tribes of Grand Ronde

Cook, Sherburne, F.

Cook, Warren

Coues, Elliott


Cox, Ross

Cressman, L. S.


Douglas, Mary 1947 Oregon Indian Basketry Types and Distribution. MS Thesis, Department of Anthropology, University of Oregon.


Eells, Myron 1878 Hymns in the Chinook Jargon Language. Portland: Geo. H. Himes, Publisher.


Everette, Willis E. 1883 The Lord's Prayer in Chinook Jargon as Spoken by the Indian Tribes that Live on the Pacific Coast of Western Oregon, U.S.A. Manuscript, Bureau of American Ethnology.


Franchere, Gabriel. 1954. Narrative of a Voyage to the Northwest Coast of America in the Years 1811, 1812, 1813, and 1814. New York: Redfield. [1814]


Harger, Jane Marie

Haswell, Robert

Henry, Alexander

Hill, Beth and Ray Hill

Hines, Gustavus

Hodge, Frederick Webb, ed.

Holman, Frederick V.

Howay, Frederic W., ed.

Hussey, John A.

Jacobs, Elizabeth D.

Jacobs, Melville


1959 The Content and Style of an Oral Literature, Clackamas Chinook Myths and Tales. Viking Fund Publications in Anthropology 25:1-293.

1960 The People are Coming Coon, Analysis of Chinook Myths and Tales. Seattle: University of Washington Press.

Jacobs, Melville, Albert S. Gatschet, Leo J. Frachtenberg

Jerzyk, Anna
1940 Winship Settlement in 1810 was Oregon's Jamestown. Oregon Historical Quarterly 41(2):175-181.

Johannessen, Carl L., W. A. Davenport, Artimus Millet, and S. McWilliams
Johansen, Dorothy O. and Charles M. Gates  

Jones, Roy  

Kane, Paul  

Kardas, Susan  

Kasner, Leone Letson  

Kehoe, James P.  

Kent, William Eugene  
1973 The Siletz Indian Reservation. MS Thesis, Department of Anthropology, Portland State University.

Kirk, Ruth and Richard O. Daugherty  

Kroeber, Alfred L.  


Lee, Daniel and Joseph H. Frost  
1968 Ten Years in Oregon. Fairfield: Ye Galleon Press. [1844]

Lewis, Albert Buel  

Loy, William G., Stuart Allen, Clyde F. Patton, and Robert D. Plank  

Mackey, Harold  


Mallery, Garrick  

Martin, Lucy N.  

McArthur, Lewis A.  

McFeat, Tom, ed.  

McKenzie, Karleen F.  
1976 A Proposal to Group the Tansy Point Ten Treaty Tribes and Bands (draft).
Meyer, Lloyd and Henry Zenk

Minto, John
1900  The Number and Condition of the Native Race in Oregon When First Seen by White Men. Oregon Historical Quarterly 1(3):296-315.

Mooney, James

Murdock, George P.

Olson, Ronald L.

Peterson, Ethel M.

Peterson, Jan

Peterson, Marilyn S.

Pilling, James C.

Pipes, Nellie B.

Powell, John W.

Ramsey, Jarold, ed.

Ratcliff, James L.

Ray, Verne F.

Rigsby, Bruce

Robbins, William G.
1974 Extinguishing Indian Land Title in Western Oregon. The Indian Historian 7:14-52.

Ross, Alexander
1923 Adventures of the First Settlers on the Oregon or Columbia River. In Early Western Travels, Volume 7, R. G. Thwaites, ed. Chicago: Lakeside Classics. [1849]

Royce, Charles C.

Ruby, Robert H. and John A. Brown

Sackett, Lee

St. Onge, Louis N.
1892 Bible History Translated in the Chinook Jargon by the Rev. L. N. Saint Onge Missionary. Manuscript submitted to T. S. Bulmer, Utah, for publication on Chinook Jargon.

Santee, J. F.

Schaeffer, Claude E.

Schoolcraft, Henry R.

Scott, Leslie H.
1928 Indian Diseases as Aids to Pacific Northwest Settlement. Oregon Historical Quarterly 29(2):144-161.

Spalding, Henry H.

Spencer, Omar C.

Sperlin, O. B.
1916 The Indian of the Northwest as Revealed by the Earliest Journals. Oregon Historical Quarterly 17(1):1-43.


Spier, Leslie


Stearn, E. Wegner, and Allen E. Stearn

Strong, Thomas Nelson


Suttles, Wayne 1960 Variation in Habitat and Culture on the Northwest Coast. Paper presented at the 34th International Congress of Americanists, Vienna.


Vancouver, George 1798 A Voyage of Discovery to the North Pacific Ocean and Round the World. Three volumes. London.


Woodward, John A.
1974   Salmon, Slaves, and Grizzly Bears: The Prehistoric Antecedents and Ethno-
history of Clackamas Indian Culture. Ph.D. Dissertation, Department of
Anthropology, University of Oregon.

Woodward, John and Dale Archibald
1975   An Unusual Historic Indian Burial from the Salmon River Estuary, Lincoln

Work, John
1923   Journey from Fort Vancouver to the Umpqua River and Return in 1834. Oregon
Historical Quarterly 24(3):238-268.

Wright, George William
1922   The Origin of the Prehistoric Mounds of Oregon. Oregon Historical Quarterly
23(2):87-94.

Wuerch, William L.
1979   History of the Middle Chinooks to the Reservation Era. MS Thesis, Department
of History, University of Oregon.

Wyeth, Nathaniel J.
1899   The Correspondence and Journals of Captain Nathaniel J. Wyeth, 1831-6. F. G.
Young, ed. Eugene: University of Oregon.

Zenk, Henry B.
1976   Contributions to Tualatin Ethnography: Subsistence and Ethnobiology. MA
Thesis, Department of Anthropology, Portland State University. Portland.
HISTORY

Exploration

Bancroft, Hubert Howe

Barry, J. N.

Beckham, Stephen Dow

Broughton, William

Caughey, John Walton

Cook, Warren L.
1973 Flood Tide of Empire: Spain and the Pacific Northwest, 1543-1819. New Haven, Conn.: Yale University Press.

Coues, Elliot, ed.

Davies, K. G. and A. M. Johnson, eds.

de Mofras, Eugen Duflot

Devoto, Bernard

Franchere, Hoyt C.

Gunther, Erna
1972 Indian Life on the Northwest Coast of North America: As Seen by the Early Explorers and Fur Traders During the Last Decades of the Eighteenth Century. Chicago: University of Chicago Press.

Hussey, John

Johansen, Dorothy O.

Lavendar, David, ed.
1972 The Oregon Journals of David Douglas of His Travels and Adventures Among the Traders & Indians in the Columbia, Willamette and Snake River Regions During the Years 1825, 1826 & 1827. 2 vols. Ashland, Ore.: The Oregon Book Society.

Maloney, Alice Bay, ed.

Menefee, Leah Collins and Lowell Tiller
Munnick, Harriet D. and Mikell Warner  

Palmer, Joel  
1847  Journal of Travels Over the Rocky Mountains, to the Mouth of the Columbia River Made During the Years 1845 and 1846. . . . Cincinnati, Ohio: J. A. and U. P. James.

Poesch, Jessie  

Porter, Kenneth Wiggins  

Ruby, Robert and John Brown  

Sheppe, Walter, ed.  

Vancouver, George  
1798  A Voyage of Discovery to the North Pacific Ocean, 4 vols. London.

Wagner, Henry Raup  
1937  Cartography of the Northwest Coast of America to the Year 1830. 2 vols. Berkeley, Calif.: University of California Press.

Wilkes, Charles  

Williamson, Robert Stockton and Henry L. Abbot  

Indian-White Relations

Beckham, Stephen Dow  


Bensell, Royal A.  

Billington, Ray Allen  

Brosnan, Cornelius  

Cook, S. F.  

Coues, Elliot, ed.  

Davies, K. G. and A. M. Johnson, eds.  

Down, Robert Horace  

Galbraith, John S.  
Hines, Gustavus

Hussey, John

Johansen, Dorothy C.

Loewenberg, Robert J.

Mackey, Harold

Marty, Martin E.
1970 Righteous Empire: The Protestant Experience in America.

Munnick, Harriet D. and Mikell Warner


O'Hara, Edwin V.

Parker, Samuel

1941 The Letters of John McLoughlin from Fort Vancouver to the Governor and Committee, First Series, 1825-38. London: The Hudson's Bay Record Society.

1943 The Letters of John McLoughlin from Fort Vancouver to the Governor and Committee, Second Series, 1838-44. London: The Hudson's Bay Record Society.

1944 The Letters of John McLoughlin from Fort Vancouver to the Governor and Committee, Third Series, 1844-46. London: Hudson's Bay Record Society.

Taylor, Herbert C., Jr. and Lester L. Hoaglin, Jr.

Thompson, Laurence

Wilkes, Charles

Zenk, Henry

Nineteenth Century Settlements

Anonymous
1878 Illustrated Historical Atlas Map of Marion and Linn Counties, Oregon. San Francisco: Edgar Williams & Co.

1947  Polk County Centennial: Souvenir Booklet and Program. Dallas, Ore.: Polk County Itemizer-Observer.


Applegate, Jesse

Applegate, Jesse A.

Barney, J. W.
1929  Columbia County, Oregon. [St. Helen's, Ore.: Columbia County] Road Master's.

Becker, Pearl

Beckham, Stephen Dow


Benson, Robert L.

Boge, Lila V. Cooper, Compiler

Bowen, William A.


Brosnan, Cornelius J.

Carney, Charles Henry

Carlton Elementary School Bicentennial Club

Cooper, Jacob Calvin
1899  Military History of Yamhill County. McMinnville, Ore.

Crawford, Medorum

Dobbs, Caroline C.

Down, Robert Horace

Fagan, David D.
1885  History of Benton County, Oregon. Portland, Ore.: A.G. Walling.

Garner, Lota Weed


Gibbs, George and Edmund A. Starling
1851 Sketch of the Willamette Valley, Showing the Purchases and Reservations Made by the Board of Commissioners Appointed to Treat with the Indians of Oregon. Map 195, Tube 458. National Archives, Washington, D.C.

Glen, Julia Weazie
1925 John Lyle and Lyle Farm. MS.

Hardy, Charles W.

Hirowitz, Howard

Hussey, John

Jackson, William Turrentine

Johansen, Dorothy D.

Johnson, W. C.

Junkin, William Sunner and Minnie W.

Lockley, Fred

Loewenberg, Robert J.

Lynch, Vera Martin

McArthur, Harriet Nowmuth

McArthur, Lewis A.

Mackey, Harold

Maddux, Harvey

Messing, John

Minor, Rick, Stephen Dow Beckham, and Kathryn Anne Toepel
Minto, John

Morgan, A. W.

Nelson, George A.
1961 Brief History of Farming and Cutting Timber in Columbia County. Columbia County History 1:30-37.

Nesmith, James W.

Nixon, Birgetta and Mabel Tucker

Orcutt, Ada M.

Palmer, Joel
1847 Journal of Travels Over the Rocky Mountains, to the Mouth of the Columbia River Made During the Years 1845 and 1846 . . . . Cincinnati, Ohio: J. A. & U. P. James.

Parker, Samuel

Powell, Fred W.

Puter, S. A. D.

Rich, E. E. and A. M. Johnson, eds.

Rock, Alexandria
1949 Short History of the Little Nestucca River Valley and Its Early Pioneers, Tillamook County, Oregon. Mrs. George R. Goodrich, ed. MS on file at the University of Oregon Library. Eugene.

Swender Blue Print Co.
1928 Map of Washington County, Ore. Portland, Ore.: Swender Blue Print Co.

Toepel, Kathryn Anne, William F. Willingham, and Rick Minor

Toepel, Kathryn Anne and Stephen Dow Beckham

Thornton, J. Quinn

West, Oswald

Economic Patterns

Adams, Kramer A.
Andrews, Ralph
1951  This Was Sawmilling. New York: Bonanza Books.

Anonymous
1903  Cut of Coast Mills. The Timberman 1.
1915  Cut of Coast Mills. The Timberman 16(3).
1919  Cut of Coast Mills. The Timberman 20(3).

Beckman, Stephen Dow

Bowen, William A.

Brooks, Howard D. and Len Ramp

Carlton Elementary School Bicentennial Club

Clark, Robert Carlton

Corning, Howard McKinley

Cornwall, George F.

Cox, Thomas

Fahl, Ronald J.

Gaston, Joseph

Horowitz, Howard

Gibbs, George and Edmund A. Starling
1851  Sketch of the Willamette Valley, Showing the Purchases and Reservations Made by the Board of Commissioners Appointed to Treat with the Indians of Oregon. Map 195, Tube 458. National Archives, Washington, D.C.

Hussey, John
1967  Emancipating: Place of Transition. Portland, Ore.: Oregon Historical Society

Johansen, Dorothy O.
Lang, Herbert C.  

Nash, Wallis  

Newton, Sidney W.  

Oliphant, J. Orin  

Oregon Census  

Palmer, Joel  
1847 Journal of Travels Over the Rocky Mountains to the Mouth of the Columbia River Made During the Years 1846 and 1846 ... Cincinnati, Ohio: J. A. and U. P. James.

Smith, Helen Krebs, ed.  

U.S. Census  

Vaughan, Thomas and Virginia Guest Ferriday  

Victor, Frances Fuller  


Federal Government Actions

Anonymous  

Beckman, Stephen Dow  

Bensell, Royal A.  

Bowen, William A.  

Corning, Howard McKinley  

Devoto, Bernard, ed.  

Dun, John F. and Francis Juris  
Gano, John Nelson

Gaston, Joseph

Gates, Paul W.

Genealogical Forum of Portland, Oregon

Gibbs, James A., Jr.

Goetzmann, William F.

Jackson, William Turrentine


Johansen, Dorothy O.

Lynch, Vera Martin

McArthur, Lewis A.

Poter, S. A. O.

Wilkes, Charles
FUTURE RESEARCH DIRECTIONS

Antevs, Ernst


Balster, C. A. and R. B. Parsons

Boyd, Robert

Collins, Lloyd R.

Courtice, Marilyn D.

Cressman, Luther S. in collaboration with David L. Cole, Wilbur A. Davis, Thomas A. Newman and Daniel J. Scheams

Detling, LeRoy E.

Douglas, David

Grayson, Donald K.

Habeck, James R.

Hansen, Henry P.

Heusser, Calvin J.

Minor, Rick and Audrey Frances Pecor

Pettigrew, Richard M.

Reckendorf, Frank F. and Roger B. Parsons
Suphan, Robert J.

Taylor, Herbert C., Jr.


Thwaites, Reuben G., Editor

Towle, Jerry

Townsend, John X.

White, John R.

Woodward, John A.

Zenk, Henry B.
FUTURE MANAGEMENT OPTIONS

Aikens, C. Melvin


Baxter, Paul W. and William F. Willingham

Binford, Lewis R., Sally R. Binford, Robert Whallon, and Margaret Ann Hardin

Butler, William P.

Chance, David H.

Connolly, Thomas J. and William F. Willingham

Glassow, M. A., L. W. Spanne, and J. Quilter

Grayson, Donald K.

House, John H. and Michael B. Schiffer

Lipe, William D.

Lovis, W. A.

Morotto, Michael J. and Roger E. Kelly

Nance, Jack D.

Raab, L. Mark and Timothy C. Klinger

Sharrock, Floyd W. and Donald K. Grayson  

Smith, Bruce D.  

Spurting, Brian E.  
1979   Resource Inventory and Assessment in the Boreal Forest. Paper Presented  
at the 44th Annual Meeting of the Society for American Archaeology, Vancouver,  
British Columbia.

Talmage, Valerie, Olga Chesler, and Staff of Interagency Archaeological Services  
1977   The Importance of Small, Surface, and Disturbed Sites as Sources of Sig-  
nificant Archaeological Data. Cultural Resource Management Studies, National  
Park Service, Department of the Interior, Washington, D.C.

Wood, W. Raymond and Donald Lee Johnson  
1978   A Survey of Disturbance Processes in Archaeological Site Formation. In  
Advances in Archaeological Method and Theory: Volume 1, Michael B.  