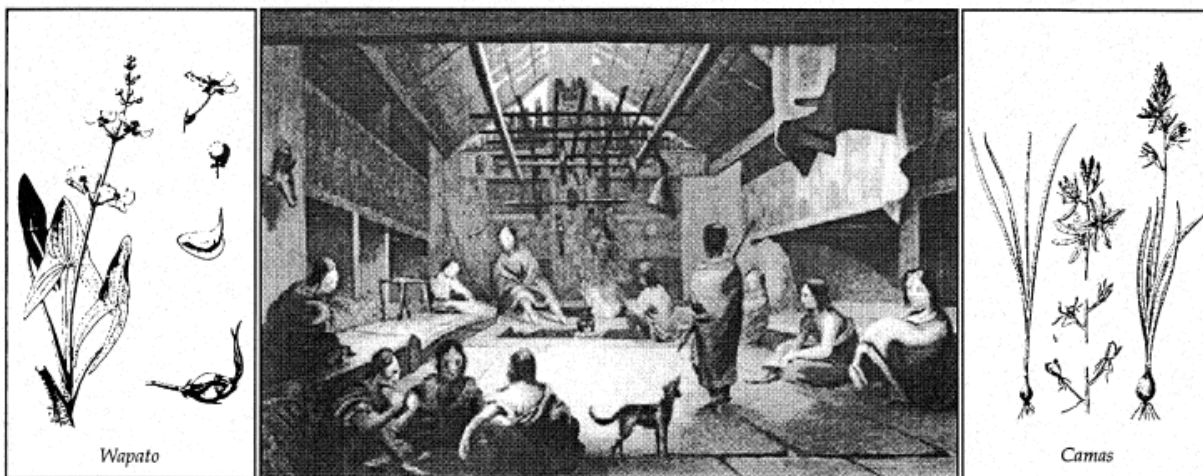


Archaeological Resources Protection Plan For Columbia South Shore



Adopted April 3, 1996
Effective May 3, 1996
Ordinance No. 169953 and 169954

Amended June 5, 1996
Effective September 1, 1996
Ordinance No. 170225

Amended August 4, 2004
Effective September 3, 2004
Ordinance No. 178567

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Portland, Oregon

September 2004
(minor technical edits made March 2018)

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FRONT COVER: Wapato (left), example of Chinookan house (center), camas (right).
Source: Oregon Council for the Humanities, *The First Oregonians*, (Portland, Oregon: 1991)

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Funding for the Bureau of Planning's participation in the development of this plan came from the City of Portland's General Fund and several Interagency agreements (with PDC, BES, PDOT and Water).

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Summary and Recommendation

This report is intended to satisfy a Statewide Planning Goal 5 requirement to protect archaeological resource areas in the City. City Council adopted the *Cultural [Archaeological] Resources Protection Plan for Columbia South Shore* on April 3, 1996. The Oregon Department of Land Conservation and Development (DLCD) approved this plan as fulfilling a required work task for periodic review. City Council amended this plan in 1996 and 2004, and replaced the term “cultural” with “archaeological” throughout the plan.

For purposes of the City’s first periodic review of the Comprehensive Plan, “archaeological resources” mean the evidence of American Indian-use in the Columbia South Shore from the pre-contact period. Within the City, the strongest evidence of pre-contact archaeological sites is in the Columbia South Shore and Smith-Bybee Lakes area, both located in the Columbia Corridor. Indian-use sites also may exist elsewhere in the City, but are not part of this scope of work.

The process used to meet the requirements of Goal 5 includes several stages, including an inventory, and analysis, and a recommended program. These three stages are discussed below.

Inventory

Chapters 1 - 6 describe the policy framework, scientific evidence and ongoing tribal interest in archaeological resources of the plan area. Chapter 7 describes numerous archaeological investigations in the plan area. The report identifies three sensitivity areas within the Columbia South Shore that warrant further consideration. Properties within each sensitivity area share, in common, environmental features associated with a certain type of Indian-use site. Chapter 8 introduces the concept of sensitivity areas, explains how they are used as an analysis tool, and explains the context in which they are used. Chapter 8 also discusses the resource functions and values of archaeological resources, and describes the three sensitivity areas, in relation to identified Goal 5 archaeological resources.

ESEE Analysis

Chapter 9 identifies permitted uses that may conflict with the inventoried archaeological resources within each sensitivity area. In accordance with the Goal 5 process, this chapter includes an analysis of the economic, social, environmental and energy (ESEE) consequences of allowing, limiting, or prohibiting those uses. This chapter concludes with a conflict resolution table (Figure 22), which sums up the appropriate protection level for each Goal 5 resource site or situation.

Recommended Program

Chapter 10 proposes measures to protect the most significant archaeological resources in Columbia South Shore. This chapter includes the recommended zoning code amendments intended to implement this plan. This chapter describes which archaeological resources are recommended for protection, and the extent of that protection. This chapter describes a process by which property owners in the affected area can reduce the level of regulatory uncertainty and risk associated with archaeological resources.

The recommended plan removes an interim resource protection review (shown as “sec” on zoning maps) from the plan area. Chapter 10 contains the eleven zoning maps where the sec overlay zone is deleted.

The Bureau of Planning wishes to acknowledge considerable assistance with the original plan of the Cultural Resources Advisory Committee, the Cultural Resources Technical Committee, property owners who participated in archaeological investigations, and the consultant team that extensively surveyed the plan area. This project has opened a dialogue between property owners and the Indian community that will make implementation more effective.

Glossary of Terms

SCIENTIFIC TERMS

The following scientific terms cover the fields of archaeology and geology. Archaeological terms are found in Oregon Administrative Rule (OAR), the Archaeological Resource Protection Act (ARPA), or the National Historic Preservation Act (NHPA). Where more than one definition exists, the state definition is cited.

Archaeological interest. (ARPA Uniform Regulations, 1984). Capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques such as controlled observation, contextual measurement, controlled collection, analysis, interpretation and explanation.

Archaeological object. (ORS 358.905 as amended in 1995 legislative session). An object that (a) is at least 75 years old; (b) is part of the physical record of an indigenous or other culture found in the state or waters of the state; and (c) is material remains of past human life or activity that are of archaeological significance including, but not limited to, monuments, symbols, tools, facilities, technological by-products and dietary by-products.

Archaeological resource. (National Park Service, 1988). The material remains of human life or activities that are capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics. Material remains of particular interest to archaeologists include physical evidence of human habitation, occupation, use or activity within sites, locations, or contexts.

Archaeological site. (OAR 736-51-070). A geographic locality in Oregon, including but not limited to submerged and submersible lands and the bed of the sea within the state's jurisdiction, that contains archaeological objects and the contextual associations of the objects with (a) each other; or (b) biotic or geological remains or deposits. Examples of archaeological sites include shipwrecks, lithic quarries, house pit villages, camps, burials, lithic scatters, homesteads and townsites.

Archaeological site. (Working definition of the Oregon State Historic Preservation Office, or "SHPO"). Either a. or b. below:

- a. Ten or more artifacts (including debitage) likely to have been generated by patterned cultural activity within a surface area reasonable to that activity (a form of density measure). For sites with less than 100 artifacts, the cultural activity must be postulated and the surface area justified for that activity; or
- b. The presence of any archaeological feature, with or without associated artifacts. Examples of features include peeled trees, cache pits, hearths, housepits, rockshelters, cairns and rock art.

Archaeology. The scientific study of past human behavior from archaeological resources and their context.

Confirmation testing. (Portland Bureau of Planning). Performing subsurface auger probes in advance of development.

Cultural area. (Statewide Planning Goal 5). An area characterized by evidence of an ethnic, religious or social group with distinctive traits, beliefs and social forms.

Cultural resources. (Interior Columbia Basin Ecosystem Management Project, draft prepared by U.S. Bureau of Land Management and U.S. Forest Service). Cultural resources include native species (plants and animals), inanimate materials, landforms, archaeological sites, ancestral grounds and other components of the physical environment associated with American Indian traditional use of the region.

Archaeological resources. (Portland Bureau of Planning). For purposes of this plan, archaeological resources mean evidence of American Indian-use in the Columbia South Shore from the pre-contact era.

Curation. (36 CFR 79.4(b)). Responsibility for the care of something held in trust for other people; curatorial services are "managing and preserving an archaeological collection according to professional museum and archival practices."

Data recovery. The gathering of information about archaeological resources through scientific research methods such as controlled site excavations and systematic aerial surveys.

Excavate. (OAR 736-51-070). To break the ground surface to remove any artifact or to remove an embedded artifact, feature or non-artifactual material in an archaeological site for the purposes of performing anthropological research.

Funerary objects. (OAR 736-51-070). Any artifacts or objects that, as part of a death rite or ceremony of a culture, are reasonably believed to have been placed with the individual remains either at the time of death or later.

Geomorphology. The study of landforms and their development.

Historic. The period after the advent of written history in a geographic region; for example, historic Native American site in North America date to after the arrival of Europeans or Euro-Americans in the particular area where such a site is located.

Objects of cultural patrimony. (OAR 736-51-070). An object having ongoing historical, traditional or cultural importance central to the native Indian group or culture itself, rather than property owned by an individual native Indian, and which, therefore, cannot be alienated, appropriated or conveyed by an individual regardless of whether or not the individual is a member of the Indian tribe. The object shall have been considered inalienable by the native Indian group at the time the object was separated from such group. Such objects do not mean unassociated arrowheads, baskets or stone tools or portions of arrowheads, baskets or stone tools.

Prehistoric site. An archaeological site dated to the prehistoric period, and for which there is no library, archival, or oral historical documentation of the site itself or its included materials.

Research design. A plan of work that identifies questions to be answered and how archaeologists will try to answer them.

Sacred object. (OAR 736-51-070). An archaeological object or other object that (a) is demonstrably revered by any ethnic group, religious group or Indian tribe as holy; (b) is used in connection with the religious or spiritual service or worship of a deity or spirit power; or (c) was or is needed by traditional native Indian religious leaders for the practice of traditional native Indian religion.

Significance. (36 CFR 60.4). The term used to tell whether an archaeological site is eligible for the National Register of Historic Places.

Site of archaeological significance. (ORS 358.905 as amended in 1995 legislative session). Any archaeological site that (a) is on, or eligible for inclusion on, the National Register for of Historic Places as determined in writing by the State Historic Preservation Officer; or (b) has been determined significant in writing by an Indian Tribe.

Stratigraphy. The layering of different kinds of sedimentary rock or earth.

HERITAGE TERMS

Appropriate Indian Tribe. (OAR 736-51-060). The Indian tribe designated by the Commission on Indian Services (CIS) as having the greatest interest in the permit application.

Chinook jargon. (Paul Kane, *Columbia Wanderer*). A mixture of French, English, Chinook and other Indian languages to communicate ideas and discuss trade. Indian groups spoke Chinook jargon as a common language when they did not know one another's language groups.

Subsistence activities. The harvesting of foods, gathering of medicines, crafts and industry-related materials, commercial uses, and attachment to ancestral places on the landscape, often in the appearance of landforms.

Traditional lifeways. The cultural behavior of groups or communities as expressed by ongoing activities. These activities are passed down generations, and include subsistence activities (e.g., digging roots, gathering plants for medicines, picking berries, making utensils and cooking) and spiritual activities.

Tribe. (adapted from Neufeldt and Guralink). A group of (American Indian) persons, families, or clans believed to be descended from a common ancestor and forming a close community under a leader, or chief. Indians of the Pacific Northwest more typically formed loose-knit groups, or bands, linked by kinship. The term "tribe" is a post-contact term used in the context of Indian/United States treaties and Indian reservations.

PLANNING TERMS

Goal 5. A portion of the Oregon Land Conservation and Development Commission land use goals, dealing with the protection and conservation of open spaces, scenic and historic areas, and natural resources.

Goal 5 inventory. (OAR 660-16-000). The collection of available data from as many sources as possible including experts in the field, local citizens and landowners. The local government analyzes and refines the data and determines whether there is sufficient information on the location, quality and quantity of each resource site to properly complete the Goal 5 process. Based on the evidence and local government's analysis of those data, the local government then determines which resource sites are of significance and includes those sites on the final plan inventory.

Ground disturbance activity. (Portland Bureau of Planning). An activity related to site development that involves surface and subsurface disturbance(s). Examples of ground disturbance activities include excavation, soil compaction, grading, trenching and chemical degradation.

Disturbance Area. (Portland Bureau of Planning). An area which contains all temporary and permanent development, exterior improvements, and staging and storage areas on the site, both existing and proposed. Native vegetation planted for resource enhancement and agricultural and pasture land is not included. For section 33.430.150, Standards for Utility lines, only the proposed development is included.

Levels of archaeological resource protection. (Portland Bureau of Planning).

- **Full protection** means (a) completing archaeological "confirmation testing" for that development site, (b) no ground disturbance of identified archaeological resources, and (c) some level of protection for adjacent transition areas.
- **Partial protection** means (a) completing archaeological "confirmation testing" for that development site, (b) partial ground disturbance of identified archaeological resources and/or recovery of associated archaeological materials, and (c) some level of protection for adjacent transition areas.
- **No protection** means (a) no further archaeological testing for that development site through State Goal 5, (b) no special restrictions on ground disturbance activities, and (c) no special restrictions on adjacent transition areas.

Private lands. (OAR 736-51-070). Any lands within the State of Oregon owned by a person, except "Private lands" does not include federal lands or nonfederal public lands, or any land the title to which is (a) held in trust by the United States for the benefit of any Indian tribe or individual; or (b) held by an Indian tribe or individual subject to a restriction by the United States against alienation.

Public lands. (OAR 736-51-070). Any lands owned by the State of Oregon, a city, county, district or municipal or public corporation in Oregon.

Sensitivity area. (Portland Bureau of Planning). The area of common historic environmental features. Examples of historic environmental features include sloughs and ponds, marshes and meadows, woodlands and forests, and grasslands. Such features were suitable to support certain Indian-use activities.

Transition area. (Portland Bureau of Planning). The area directly between the archaeological resource and the surface layer and extends horizontally out from the edge of the archaeological resource. Features associated with a resource, not identified through auger testing, may also be encountered in the transition area. (see Figure 515-6).

CHAPTER 1: INTRODUCTION

PURPOSE

The *Archaeological Resources Protection Plan for Columbia South Shore* (hereafter, "Archaeological Plan") provides the inventory, analysis and recommendations to protect significant Indian use sites (cultural resources) located in the Columbia South Shore in northeast Portland.

The plan area is bounded on the west by NE 82nd Avenue, the east by NE 185th Avenue, the north by the Columbia River, and the south by NE Sandy Boulevard/railroad tracks (see Plan Boundary Map on page 2). The zoning code recognizes this area as the Columbia South Shore Plan District (Chapter 33.515).

This is the City's most detailed archaeological resource plan. The Archaeological Plan is designed to comply with the Oregon Statewide Planning Goal 5, which requires all jurisdictions in Oregon to "conserve open space and protect natural and scenic resources." The Goal 5 Administrative Rule prescribes the following three-step planning process:

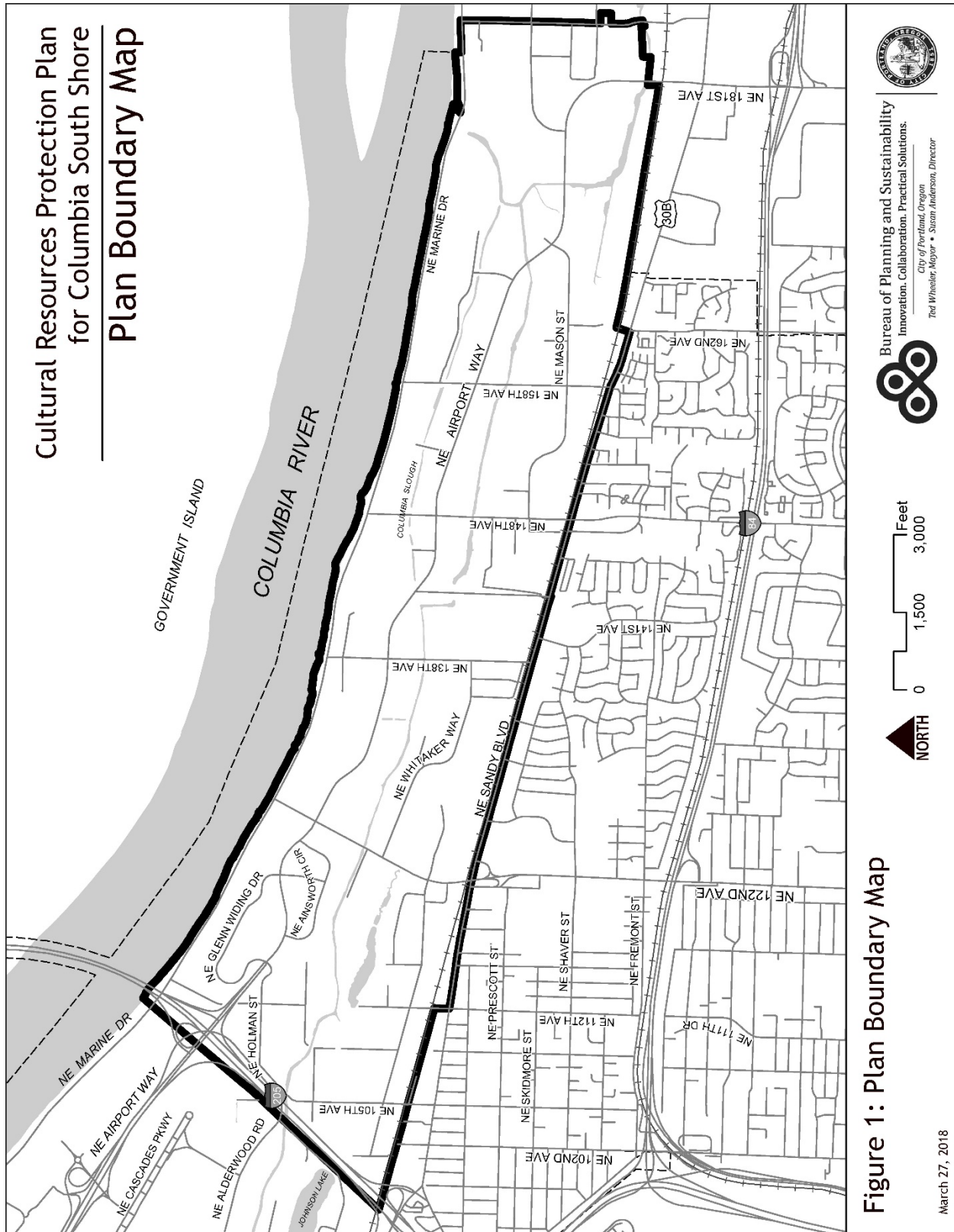
1. Inventory of location, quantity and quality of Goal 5 resources;
2. Analysis of economic, social, environmental and energy (ESEE) consequences of allowing, limiting or prohibiting conflicting uses;
3. Development of a plan to protect significant resources.

This report is intended to satisfy the Goal 5 Rule and applicable case law.

ARCHAEOLOGICAL RESOURCES DEFINED

Statewide Planning Goal 5 identifies twelve natural and cultural resources for cities and counties to address. One of the twelve resources is "cultural areas." Goal 5 states as follows: "*Cultural area refers to an area characterized by evidence of an ethnic, religious or social group with distinctive traits, beliefs and social forms.*" The state gives cities and counties broad discretion to identify the ethnic, religious or social group; the distinctive traits, beliefs and social forms; and the nature of evidence to submit in describing the cultural area.

In 1989, the Portland City Council defined its intent to pursue archaeological resources in the Columbia Corridor area as its response to Goal 5 / cultural areas. In its Proposed Local Periodic Review Order (Resolution 34523), City Council found that Columbia South Shore and the vicinity of Smith and Bybee Lakes were the most likely potential source of archaeological resources within



the City. Both areas are located within the Columbia Corridor, and contain recorded archaeological sites. Within the City, the Columbia Corridor is mostly industrial, and extends from the Willamette River to NE 185th Avenue, generally north of NE Sandy/Columbia Boulevard. The Council concluded that, unless the State provided site-specific archaeological resource information, the City would not be able to amend its Comprehensive Plan or implement measures.

For purposes of the Archaeological Plan, cultural resources are defined as **evidence of American Indian use in the Columbia South Shore from the pre-contact era**. American Indian culture, beliefs and lifeways are distinctive from the dominant culture. This definition breaks down as follows:

- Columbia South Shore is a key part of the Columbia River basin. The Columbia River basin experienced one of the highest population densities of the Pacific Northwest. In the early 1800's, Lewis and Clark recorded two Indian village sites on the south bank of the Columbia River in vicinity of Columbia South Shore.
- The "pre-contact" era refers to the time period before Europeans and EuroAmericans contacted the American Indians. Indians relied on an oral tradition. Archaeologists often describe this time period as the "prehistoric" era, which refers to the time before the advent of written history in a geographic region. Tribal representatives prefer the term "pre-contact" because "prehistoric" may suggest people and practices that have died out. Despite the hardships, Indians and their heritage values survive today.
- Relevant evidence for cultural resource sites (sensitivity areas) includes archaeological sites and other components of the physical environment associated with American Indian traditional use of the area (native species, inanimate materials, landforms and ancestral grounds). Sources of such evidence may include archaeological reports and Tribal oral histories.

RELATION TO OTHER RESOURCE PLANNING PROJECTS

The *Archaeological Resources Protection Plan for Columbia South Shore* is integrated with other City Goal 5 resource plans. Such integration occurs within the Columbia South Shore and by resource type.

Columbia South Shore

Within Columbia South Shore, City Council has adopted Goal 5 resource plans for natural resources and scenic resources. Briefly, these plans identify a number of resource sites which may have a bearing on archaeological sites:

Natural resources. The *Natural Resources Protection Plan for Columbia South Shore* (hereafter, the natural resources plan, adopted 1993) identifies 38 natural resource sites covering 613 acres (or approximately 22 percent) of the plan area. The natural resources plan provides an area-wide approach to conserve significant natural resources and to preserve resource values in the Columbia South Shore. It addresses protection of ecosystems related to the Columbia Slough, allowing coordination with other local, state, and federal agencies to provide a comprehensive approach in protecting significant natural resources.

Scenic resources. The *Development Standards for Columbia South Shore* (hereafter, DS project, adopted 1993) identifies three scenic corridors and four view corridors that affect the plan area. Some of the scenic resources were designated as part of the citywide *Scenic Resources Protection Plan* (adopted in 1991). The scenic corridors (Marine Drive, the Columbia River and the Columbia Slough) extend westerly through the plan area and into other parts of the Columbia Corridor. There are three protected view corridors (to Mt. Hood or Rocky Butte).

The resulting environmental and scenic overlay zones are shown on Figure 4 of this report. Also shown in Figure 4 is the interim cultural resource (sec zone) overlay zone, as described below.

Cultural Resources

As mentioned above, the *Natural Resources Management Plan for Smith and Bybee Lakes* (hereafter, Smith-Bybee Lakes Plan) marked the first resource plan adopted by the City to protect archaeological resources. In November 1990, the Portland City Council, Metro and Port of Portland adopted this plan covering a natural area at the western end of Columbia Corridor. The Smith-Bybee Lakes plan recognizes the entire lake complex as an archaeologically significant area. Two management plan policies relate directly to archaeological resources:

Policy 27: Archaeological resources shall be included as a major feature of the Management Area. Interpretation of archaeological resources and the prehistoric ways of life of the native peoples of the Portland area shall be integrated into educational programs developed for the Smith and Bybee Lakes area.

Policy 28: When any development within the Management Area is planned, the following steps will be taken in the area affected by the proposed development to insure protection of archaeological resources:

- Obtain information on recorded sites within the area affected from the State Historic Preservation Office;
- Evaluate the current status of the known sites;
- Conduct reconnaissance surveys in areas affected by proposed projects which include dredging, excavation, fill, or possible changes in the hydrological regime of the lakes and Columbia Slough;
- Evaluate potential impacts of the proposed project on the archaeological resource; and
- In cases where significant archaeological resources are identified, take appropriate measures to avoid impact or to develop appropriate mitigation measures through consultation with the associated Tribes and the Oregon Historic Preservation Office.

Within Columbia South Shore, archaeological resource protection measures have long applied to certain areas of the district. In 1978, Multnomah County applied a land use review, the Significant Environmental Concern (sec) zone to protect a broad range of Goal 5 resources, including archaeological resources. Upon annexation of the plan area, the City applied a similar land use review (now called the Interim Resource Protection zone), and still commonly referred to as the "sec" zone. Presently, the sec zone applies to the vicinity of NE Marine Drive and along the cross-dike, to provide interim protection of archaeological resources until permanent measures are implemented with this plan. The City's first effort to replace interim measures with permanent archaeological resource measures in the plan area was short-lived. In November 1990, City Council adopted *the Natural Resources Management Plan for Columbia South Shore* (hereafter, NRMP). The main thrust of this plan was to protect wetlands, water bodies and wildlife habitat areas. The NRMP also required applicants of environmental reviews to submit an archaeological report. The archaeological report was to be prepared by a qualified archaeologist, who would review existing literature and walk the site. Depending on the archaeologist's findings and recommendation, the environmental review might require mitigation and data recovery.

It was believed that the protected natural resource areas were also high probability areas for past Indian use. Traditional Indian use materials include wapato, camas and other native plants and animals that are well suited to natural resource areas in the plan area.

On appeal, the Land Use Board of Appeals remanded (sent it back to the City for more work) the *Natural Resources Management Plan for Columbia South Shore*. An arbitrated decision between parties led to a stripped down version of the original plan. In its place, City Council adopted the *Natural Resources Protection Plan for Columbia South Shore*. The new natural resources plan contains no measures to protect archaeological resources.

Other resource planning efforts in Columbia South Shore include plans to protect the region's backup water supply, build a recreational trail along the Columbia Slough, and reduce pollutant levels in the slough. Details follow:

- The wellhead protection plan seeks to protect the integrity of the aquifers which underlie the plan area. The wellhead protection plan prohibits certain high-impact industries and requires that potential spill areas are designed to isolate and contain hazardous materials spills. The containment measures may reduce the chance that hazardous and other materials leak onto the ground and damage a cultural resource. The Portland Water Bureau is lead agency.
- The *Columbia Slough Trail Master Plan* (hereafter, Slough Trail Plan, adopted 1993) identifies 6.7 miles of soft surface, pedestrian trail to be constructed along the Columbia Slough within the district. The slough trail is part of the larger 40 Mile Loop Trail system which encircles the City. The Columbia Corridor trail segment will eventually connect Kelly Point Park to the Sandy River. The Slough Trail Plan may benefit archaeological resources by limiting the depth of ground disturbance impacts along a portion of the slough. As described in Chapters 5 and 8, Indians likely used the Columbia Slough for travel and resource extraction activities. Nearby grasslands were suitable for campsites, and possibly residential sites.
- The Portland Bureau of Environmental Services (BES) has initiated a number of projects to reduce pollutants and sediment in the Columbia Slough. Projects that result in planting traditional Indian use plant materials (for instance, wapato and camas) serve to strengthen archaeological resource values. An example of a partnership arrangement between the City and Tribes is with the Ramsey Lake Wetland Restoration Project. The Bureaus of Environmental Service and Planning met with associated Oregon Tribes on project design and selection of native plants for the wetland project.

A coalition of persons interested in finding solutions to the Columbia Slough have formed the Columbia Slough Watershed Council. Though the watershed

council's interest extends beyond Columbia South Shore, its impact may be felt in improving communication between disparate stakeholders.

On the state level, this plan supports the efforts of SHPO to identify and protect archaeological sites and objects pursuant to recent changes in state statutes. The City has delivered to SHPO the results of an area-wide archaeological inventory for use by the state archaeologist. The plan has also increased awareness of archaeological resource issues and opened a dialogue between property owners, Tribes and archaeologists.

PLAN AREA IN TRANSITION

The Columbia South Shore Plan District consists of a portion of the southern floodplain of the Columbia River in northeast Portland generally bounded by NE 185th Avenue on the east, NE 82nd Avenue on the west, Union Pacific railroad tracks (near Sandy Boulevard) on the south, and the Columbia River on the north (see Plan Boundary Map). The project area consists of approximately 4.5 square miles (2800 acres). As of spring 1994, the district held an estimated 1700 acres (60 percent) of vacant land. The project boundaries include portions of 12 legal sections as follows: T1N, R2E, Sections 9, 10, 13, 14, 15, 16, 21, 22, 23, and 24; and T1N, R3E, Sections 19 and 20, W.M.

The evolving nature of the Columbia South Shore, from farm use to industrial use, is readily apparent to the casual observer. The South Shore now contains a dwindling number of small farm holdings, primarily east of NE 138th Avenue, as business and industrial developments expand from the west following the newly constructed Airport Way. Over the last century, agricultural, urban, and industrial developments have altered the natural state of the area.

The Columbia South Shore consists of low-lying, gently rolling terrain containing typical floodplain features such as sloughs, ponds, small lakes, and marshes. The floodplain in this area is generally less than 20 feet in elevation and ranges from approximately 1200 meters (0.76 mile) wide near NE 185th Avenue to nearly 3 kilometers (1.8 miles) wide by NE 82nd Avenue. The low-lying terrain is broken occasionally by a few higher ridges, some of which are remnant gravel bars from late Pleistocene Missoula floods. Along the southern edge of the project area, which extends to the foot of the upland that bounds the floodplain on the south, elevations reach approximately 40 feet (for further information on the geologic history of the Columbia South Shore, see Chapter 3).

Before the twentieth century, the Columbia South Shore was characterized by a mosaic of interconnected wetlands (see Figure 8: Reconstructed Environmental

Features Map, page 81). Agricultural activity, draining and diking actions have radically altered the natural vegetation of the Columbia South Shore. In general, hydrophytic plant species, plants that grow in water or in saturated soil, dominated the land below 20 feet in elevation. Such plants were well adapted to an annual cycle of inundation. On landforms above 20 feet, stands of Douglas fir and white oak grew in dry meadows and small forests. For more information on native plant communities, see Chapter 4.

Because of its low-lying nature, the Columbia South Shore was subject to seasonal inundation by freshets as the result of melting snows or heavy rains. Before the construction of dikes, the floodplain was flooded regularly by the summer freshet (May-June); often but less regularly by the winter freshet (January to February); and every five to 10 years by late fall floods (November to December). In addition, the project area was inundated by several major floods in historic times, notably the flood of 1876 (elevation 33.7 feet), the flood of 1894 (elevation 39.2 feet), and the flood of 1948 (elevation 35 feet).

When the river level reaches 14 feet, the Columbia River overflows into Columbia Slough, the major drainage feature within the project area. Originating in the northeast corner of the project area, the historical Columbia Slough flows generally westward, paralleling the river, for approximately 4.0 kilometers (2.4 miles) before reaching the western boundary of the project area at NE 82nd Avenue. Today, a channel flowing westward from Fairview Lake is connected to the historical Columbia Slough by an artificial north-south drainage (Ellis and Fagan 1993:5). From the western boundary of the project area, the Columbia Slough proceeds another 15 kilometers (9 miles) before emptying into the Columbia River.

Since 1917, a drainage district has initiated a number of flood control measures affecting the Columbia South Shore and vicinity. By 1921 the Multnomah County Drainage District #1, in conjunction with the Corps of Engineers and the U.S. Bureau of Reclamation, had built a dike along the Columbia River and installed several drainage ditches. Between 1935 and 1940, the Columbia River dike was raised and widened, cutting off the Columbia Slough from the river. Multnomah County built Marine Drive, a two-lane asphalt road, on top of this dike. The dike was raised again in 1950 after the disastrous flood of 1948. Next, the U.S. Army Corps of Engineers built a levee along the shoreline that protects the South Shore floodplain from flood stages as high as the 1894 event (Kongas 1979:8). To improve farm yields, farmers built artificial ditches and heavily modified natural sloughs (Ellis and Fagan 1993:18-19).

Farming in this area began in the mid-nineteenth century with the arrival of Euroamerican settlers. Due to the annual flooding of the Columbia River, the growing season on the floodplain for these early farmers was short (July to

October). Consequently, dairy farming and cattle grazing emerged as a mainstay by the turn of the century. Later, as the South Shore floodplain became protected from all but the most severe floods, dairy farming gave way for the most part to small-scale truck farming (Kongas 1979:5-6). Today, most farming takes place in the eastern portion of the project area, as the western portion has been largely taken over by business and industrial developments expanding eastward from Portland. A generalized view of urban ground disturbance in the plan area is shown on Figure 2 (page 14).

AREAWIDE INVENTORY

Although the Portland Basin has long been recognized as a region rich in Indian use sites for the period before contact with Europeans, research by qualified archaeologists on the Columbia South Shore did not get underway until 1977. Most of the pre-contact sites identified on the Columbia South Shore were recorded during two large-scale surveys carried out in 1979 (Kongas 1979) and 1989 (Burtchard 1990). As a result of these and other archaeological investigations, the Columbia South Shore has been identified as an area where potentially significant archaeological resources may be affected by proposed development.

In January 1994, the City of Portland hired a consultant team to conduct an area-wide archaeological inventory of the Columbia South Shore. The consultant team included Heritage Research Associates (archaeologists), David Newton and Associates (geologists) and SRI/Shapiro (botanist). Heritage Research Associates (hereafter, HRA) served as the lead consultant. The HRA team performed four tasks:

1. Verify and refine information on previously recorded sites in the project area;
2. Identify additional site locations through surface survey and limited auger testing;
3. Interpret the record of prehistoric occupation on the Columbia South Shore; and
4. Develop a framework predict prehistoric site locations for land use planning purposes.

In late January 1995, the HRA team submitted a final draft report to the Bureau of Planning. The HRA draft report is intended to provide a baseline for Indian use sites in the Columbia South Shore as known by the archaeological community as of July 1, 1994. The draft report synthesizes the available archaeological data from this area, including recent archaeological investigations

funded by specific development projects. The archaeological community will continue to investigate in the plan area, and will add to our understanding of past lifeways.

The City's Goal 5 inventory, draws on background material and site-specific findings from the consultant report. Technical information is generalized to appeal to the general reader and protect archaeological site locations.

USE OF ARCHAEOLOGICAL SITE RECORDS

A VULNERABLE RESOURCE

Archaeological resource sites are easily buried, disturbed or destroyed. In the Columbia South Shore, natural causes include seasonal flooding and the deposit of silt. Manmade causes include irrigation and tilling, road building and other forms of urban development. Over the years, individual artifacts have been picked up from fields and placed in personal collections, without the benefit of documenting those finds.

The National Trust for Historic Preservation cites six causes of site destruction. First, the general public is fascinated with the past, and may unintentionally damage an archaeological site. Second, some people seek to possess archaeological materials, and will go to great lengths to remove the materials from their sites. Third, rare or exotic archaeological materials may yield thousands of dollars in trade. Fourth, existing laws do not fully protect archaeological sites, particularly archaeological sites on private property. Fifth, existing laws give persons the right to possess, buy and sell legally obtained archaeological materials. Sixth, it is difficult to prove the original locations of such materials [Hutt, Jones & McAllister, p. 15].

Looting refers to illegal, unscientific removal of archaeological resources. Looting occurs primarily on public and tribal lands, where it is prohibited by a variety of laws. It may also take place on private property if unscientific removal of archaeological resources is carried out without permission of the owners.

The legal counterpart to looting is called artifact hunting. Artifact hunting refers to legal, unscientific removal of archaeological resources. Some artifact hunters search only for surface materials, while others walk the surface and dig. The more active artifact hunters participate in well-organized clubs or associations, which sometimes publish newsletters or journals. Most artifact hunting occurs on private property, either by the owners or with their permission.

Other participants in the unscientific removal of archaeological materials include artifact dealers and collectors. Dealers are the middlemen who buy from commercial looters and artifact hunters and sell to artifact collectors. Archaeological materials are actively traded throughout the United States and in other countries.

MANAGING SITE RECORDS

The state public records statutes recognize the potential for misuse of archaeological site records. Such records are conditionally exempted from public records requests. In August 1994, the Portland City Council affirmed its intent to limit disclosure of archaeological site records, consistent with state law. (See Appendix A, under separate cover).

Property owners and qualified archaeologists have direct access to archaeological site records at the Oregon State Historic Preservation Office (SHPO). Other persons, including prospective buyers and realtors, may request access to site records. Those requests will be considered on an individual basis, balancing the requester's need to know the information with the public's interest in protecting the integrity of archaeological resources. On behalf of the City of Portland, the Bureau of Planning has processed individual requests for access to site records generated by this plan. Planning staff recommend that the City formally make this records management procedure permanent with this plan.

PUBLIC REVIEW PROCESS (FOR ORIGINAL PLAN)

The Bureau of Planning's Archaeological Resources Project has involved the general public and associated Tribal governments at a number of decision points. Mayor Katz and Commissioner-in-charge Charlie Hales formally invited associated Tribal governments to participate in the project on a government-to-government basis. The Bureau of Planning formed a Cultural Resources Advisory Committee (policy committee) and a Cultural Resources Technical Committee (technical committee).

The policy committee consists of three tribal government representatives, three business representatives and a neighborhood representative. The technical committee consists of three peer archaeologists, two cultural resource advisors and five City bureau representatives. The Bureau of Planning has met regularly with those City representatives to oversee the archaeological consultant contract and coordinate City activities relating to archaeological resource protection. Membership of the committees is found on the Acknowledgments page at the front of this report.

The bureau has met twice with each Tribal Council and several times with the Environment and Land Use Committee of the Columbia Corridor Association.

The Planning Commission received several briefings on the project. On April 25, 1995, the Planning Commission held a public hearing on an archaeological resources inventory report, prepared by the Bureau of Planning. Eleven persons testified at the hearing.

Testimony was mixed. Tribal representatives and archaeologists supported the project and proposed inventory. An archaeologist affirmed that the inventory methods and conclusions were scientifically sound. Several persons, particularly property owners and business persons, voiced concern that the proposed inventory included too many properties and should not be adopted separate from the analysis and protection measures. Staff agreed that the inventory report could be made more clear as to the affected properties. Staff offered to return to the Commission with a full Goal 5 proposal.

On January 9, 1996, the Planning Commission held a public hearing on a full Goal 5 proposal, including a staff report and recommendation, dated December 12, 1995. For this and the earlier public hearing, the bureau sent over 500 public notices. The mailing list included associated Tribes, all property owners in the plan area, recognized business and neighborhood organizations, persons and organizations requesting the project notice, persons interested in Planning Commission issues, and brokers who participated in the real estate survey. The Planning Commission directed planning staff to identify and respond to specific requests to amend the staff report and recommendation. The written record was held open through January 3, 1996.

On February 9, 1996, staff discussed amendment requests with the Cultural Resources Advisory Committee. On February 13, 1996, the Planning Commission reviewed staff responses to the 29 amendment requests, and accepted several of the amendments. The Planning Commission voted to approve the *Archaeological Resources Protection Plan for Columbia South Shore*, with certain amendments.

City Council held a public hearing on March 27, 1996 to receive the Planning Commission recommendation and take public testimony. The Cultural Resources Advisory Committee, the Cultural Resources Technical Committee, and representatives of the Grande Ronde Tribes and the Warm Springs Tribes testified in favor of the plan. One property owner asked that the cultural plan show his property as having completed confirmation testing. Planning staff replied that, as of the hearing date, the comment period for further testing was not complete. Staff offered to periodically update the cultural plan to reflect

confirmation of certain properties. Staff will also issue zoning confirmation letters for properties that test negative for cultural resources. On April 3, 1996, City Council adopted the *Cultural [Archaeological] Resources Protection Plan for Columbia South Shore - Planning Commission Recommendation* unanimously, with no amendments.

On May 14, 1996 the Planning Commission held a public hearing on a minor amendment to the newly-adopted archaeological plan. The amendment modified new Map 515-7 of the zoning code, to recognize the completion of sample testing (called "confirmation testing") which was in progress on two properties during the later phases of public review of the original Archaeological Plan. The amendment also standardized punctuation, cross references, and word choices in the plan district. The Planning Commission approved the staff proposal unanimously, with no amendments. On May 29, 1996 the City Council held a hearing to receive the Planning Commission recommendation and take public testimony. On June 5, 1996, City Council held a second public hearing and adopted the amendments unanimously, with no amendments.

UPDATE PROCESS

In Spring 2004, an update of the archaeological plan was adopted using the City's legislative procedure (PCC 33.740). As part of Regulatory Improvement workplan: Policy Package 3, the amendments were discussed at two open houses (March 31, 2004 and May 5, 2004), and public hearings before the Planning Commission and City Council. Public notice was mailed to over 2,100 persons and three recognized tribal governments. In addition to the legislative notice list, the bureau sent notice to members of the original Cultural Resources Advisory Committee and Cultural Resources Technical Committee. On May 25, 2004, the Planning Commission heard from six persons.

City Council held a public hearing on July 28, 2004 to receive the Planning Commission recommendation and take public testimony. Eight persons provided testimony at the hearing, mostly about other subjects.

A unique feature of archaeological resources is the need to limit disclosure of site records (site boundaries and artifacts found). As with the archaeological plan's original adoption, the 2004 adoption involved review and adoption without viewing confidential site records.

ORGANIZATION OF THE PLAN

This report (*Archaeological Resources Protection Plan for Columbia South Shore*) has an introduction, ten chapters, and appendices:

- Chapter 1: Introduction
- Chapter 2: Policy Framework
- Chapter 3: Geology and Geomorphology
- Chapter 4: Native Vegetation Communities
- Chapter 5: Ethnography and Ethnohistory
- Chapter 6: Ongoing Tribal Interests
- Chapter 7: Archaeological Investigations
- Chapter 8: Goal 5 Inventory Sites
- Chapter 9: Analysis of Economic, Social, Environmental and Energy
Consequences of Archaeological Resource Protection
- Chapter 10: Protection Plan Measures

Chapters 1 - 5 provide background information on public policies, historic geology and vegetation, and ethnographic work. Chapter 6 discusses ongoing tribal interests in the plan area. Chapter 7 describes archaeological investigations and land use modeling of the plan area. Chapter 8 identifies three sensitivity areas to serve as the Goal 5 inventory. Chapter 9 identifies conflicting uses and related consequences using the ESEE analysis prescribed by the Goal 5 rule. Chapter 10 gives staff recommendations to implement the Plan.

Appendices to this plan are found under a separate cover. This separate document includes: City Council directives; the adopted statewide planning goal (Goal 5); the Goal 5 administrative rule; related Warm Springs Tribal Ordinances; a review of archaeological survey methods; correspondence related to this plan; correspondence and implementing ordinances.

Cultural Resources Protection Plan
for Columbia South Shore

Ground Disturbance Status Map
(As of 1996)

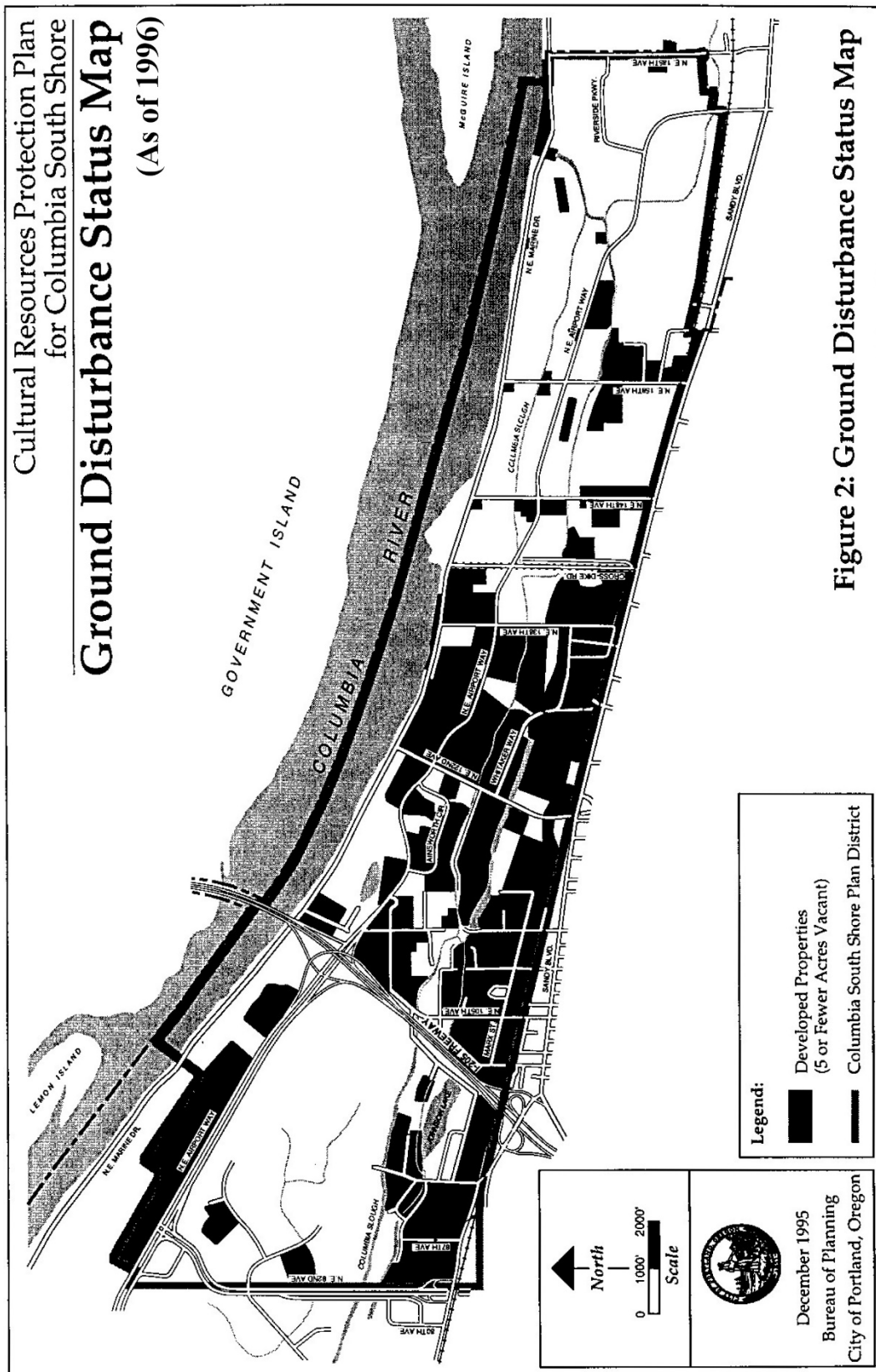


Figure 2: Ground Disturbance Status Map

CHAPTER 2: POLICY FRAMEWORK

This chapter presents the policy framework which guides the development and implementation of the *Archaeological Resources Protection Plan for Columbia South Shore*. The following discussion mentions some, but not all of the federal statutes that may impact decisions concerning archaeological resources. In addition to statutes governing protection of archaeological resources, statutes concerning religious freedom, such as the American Indian Religious Freedom Act (AIRFA) and the Religious Freedom Restoration Act (RFRA) may also be relevant. The discussion covers coordination with legislation and public agencies from the federal to the local level. The section begins with a discussion of the federal statutes, followed by a discussion of state, tribal, regional and local policies and programs.

FEDERAL

There are a myriad of federal acts and treaties which provide varying degrees of protection for American Indian archaeological resources. The majority of federal law codifies a national commitment to archaeological conservation, beginning with the Antiquities Act of 1906, 16 U.S.C. sec. 431-433 (1979), and includes the Historic Sites Act of 1935, 16 U.S.C. sec. 461-467 (1979); the Reservoir Salvage Act of 1960, 16 U.S.C. sec. 469-469(c) (1979); the National Historic Preservation Act of 1966, 16 U.S.C. sec. 470-470w-6 (1979 & Supp. 2000); the National Environmental Policy Act of 1969, 42 U.S.C. sec. 4321-4347 (1979); Executive Order 11,593, 3 C.F.R. 154 (1971); and the Archeological Resources Preservation Act, 16 U.S.C. sec. 470aa-470ll (1979 & Supp. 1988). More recently, Congress has provided for additional protection and return of American Indian remains under the Native American Grave Protection and Repatriation Act of 1990, 25 U.S.C. sec. 3001-3013 (Supp. 1991) and the National Museum of American Indian Act, 20 U.S.C. sec. 80q-80q-15 (Supp. 1990). Complimentary Oregon laws include Protection of Indian Graves, ORS 97.740-.760 (1985); Public Records Exempt from Disclosure, ORS 192.500(1)(L) (1985); Removal of Historic and Other Valuable Materials, ORS 273.705-.711 (1985); and Archeological Objects and Sites, ORS 358.905-.955 (1985).

Federal statutes designed to protect and promote the rights of American Indians in other areas also affect tribes' archaeological resources, including the American Indian Religious Freedom Act of 1978 (AIRFA), 42 U.S.C. sec. 1996 et.seq. (1978) (protection and access to sites, use and possession of sacred objects, and freedom to worship through ceremonies and traditional rights); the Religious Freedom Restoration Act (RFRA), 42 U.S.C. sec. 2000bb et.seq.; the Native American Language Act, 25 U.S.C. sec. 2901-2906 (1990) (unique status of American Indian

cultures and languages); the Indian Arts and Crafts Act, 18 U.S.C. sec. 1158-1159, 25 U.S.C. sec. 305 et seq. (Supp. 1992) and even the Indian Child Welfare Act, 25 U.S.C. sec. 1901 (3)(1978) (Congressional finding that "there is no resource that is more vital to the continued existence and integrity of Indian tribes than their children"). For additional information, see Getches, et. al, **Federal Indian Law** 768-73 (1993); and Fish, *Federal Policy and Legislation for Archeological Conservation*, 22 Arizona Law Review 681 (1980).

STATE

The Oregon SHPO maintains the statewide inventory of historic and archaeological resources. This database contains all information in the State historic preservation office resulting from federal, state and local historic property surveys as well as sites listed, or eligible for inclusion of the National Register. The ultimate goal of the database is to have every published and unpublished survey, testing, excavation and research report mapped into the system. According to 36 CFR 60, the database should be kept up-to-date and organized in such a manner that the information is easily available to federal, State and local planners during the decision-making process.

It is the SHPO's responsibility to represent the interests of the State and its citizens, and to work to insure the preservation of the State's cultural history. The state archaeologist has defined archaeological survey and reporting standards for use in archaeological investigations. The staff archaeologist maintains the archaeological data, reads all of the published and unpublished literature relating to actions across the state and develops the review and compliance aspect of the statewide comprehensive plan.

ARCHAEOLOGICAL PERMITS

The Oregon State Historic Preservation Office (SHPO) is the lead agency to protect Oregon's archaeological resources located on public lands or that can be impacted by federal actions. SHPO is a unit of the Oregon Parks and Recreation Department. The Parks' mission is to provide and protect outstanding natural, scenic, cultural, historic and recreational sites for the enjoyment and education of present and future generations. SHPO programs represent cooperative efforts with federal, state, tribal and local governments and other interested parties to preserve the archaeological and historical resources of Oregon.

In 1993 and again in 1995, the State Legislature amended the archaeological permit rules to address archaeological resources on private lands. The 1993 amendments strengthen the voice of Indian tribes in determining whether a site is significant and whether to issue an archaeological permit. The state

archaeological permit process is triggered by proposed activities that alter or otherwise impact an archaeological site.

Furthermore, the 1993 amendments require an archaeological permit for collecting artifacts on private lands. The 1995 amendments further address consequences for archaeological site disturbance on private land whether intentional or not, including increased penalties for violation and requirements for Tribal notification.

Current permit rules for private lands follow:

- A person may not excavate, injure, destroy or alter an archaeological site or object or remove an archaeological object from private lands in Oregon unless that activity is authorized by a state archaeological. Exempted from the permit process are collection of an arrowhead from the surface if collection can be accomplished without the use of any tool and unintentional discovery from natural process. ORS 390.235 covers archaeological permits issued to archaeologists to work on public lands.
- A plaintiff (appropriate Tribe) shall recover imputed damages in an amount not to exceed \$10,000 or actual damages, whichever is greater. Actual damages include special and general damages, which include damages for emotional distress. In addition, a plaintiff may recover punitive damages upon proof that the violation is willful. Punitive damages may be recovered without proof of actual damages.
- It is strongly recommended that anyone considering a development project on private lands on previously undisturbed ground contact the SHPO and the appropriate Tribe(s) to determine whether archaeological sites and objects are likely to be present in the project area.
- Requires notification of appropriate Tribe(s) before conducting an archaeological excavation associated with an American Indian archaeological site and upon discovery of a sacred object or object of cultural patrimony. Failure to notify the appropriate Tribe(s) is a Class B misdemeanor.
- SHPO is coordinating, along with governing bodies of Oregon Tribes, the Commission on Indian Services, joint efforts to create and disseminate information materials.
- Affirms that permits for private property follow the same process as permits for public property except for additional items required under 358.905.
- Archaeological permits become null and void if the activity includes burials, funerary objects or human remains, unless done under 97.750 to protect remains.
- Sets up a dispute resolution process.

SHPO rules continue to apply to public lands (OAR 736-51-080), as follows:

- Requires an archaeological permit to excavate or alter an archaeological site, make an exploratory excavation to determine the presence of a site, or remove certain materials.
- Requires notification of appropriate Tribe(s) before conducting an archaeological excavation associated with an American Indian archaeological site and upon discovery of a sacred object or object of cultural patrimony. Failure to notify the appropriate Tribe(s) is a Class B misdemeanor.
- Limits permit applicants to qualified archaeologists.
- Requires permittees to consult with the appropriate Indian Tribes during a 30-day comment period.
- Offers an expedited consultation process for discovery situations.
- Reviews, and possibly suspends or revokes, the permit if human remains, funerary objects or sacred objects are encountered during an excavation.

Within the plan area, public lands are owned by the Port of Portland, City of Portland and Multnomah County.

In 1993, the State Legislature mandated the formation of the Oregon Heritage Task Force to design an effective and economical network to administer the State's cultural heritage. The task force recognized that archaeological information helps to illuminate our collective pasts. Those that have been excavated and those that are still untouched deserve our protection. They are all valuable archaeological resources of our collective heritages.

STATEWIDE PLANNING GOALS

Oregon's statewide land use planning program was established by Senate Bill 100 and adopted by the Legislature in 1973. The bill is included in the Oregon Revised Statutes (ORS) as Chapter 197. The legislation created the Land Conservation and Development Commission (LCDC) and gave it the authority to adopt mandatory Statewide Planning Goals. These goals provide the framework for Oregon's cities and counties to prepare and maintain comprehensive plans.

After local governmental adoption, comprehensive plans are submitted to the Department of Land Conservation and Development (DLCD) for review to ensure compliance with and implementation of the Statewide Planning Goals. A comprehensive plan is acknowledged by DLCD when it is found to comply with

the goals. The City of Portland's Comprehensive Plan was adopted by City Council in 1980, effective January 1, 1981, and acknowledged by DLCD in May of 1981.

PERIODIC REVIEW

Also in 1981, the Legislature amended ORS Chapter 197 to require periodic review by the state of acknowledged comprehensive plans. The purpose of periodic review is to ensure that each local government's comprehensive plan and land use regulations are in compliance with the Statewide Planning Goals and coordinated with the plan and programs of other state agencies. New Statewide Planning Goals or Rules adopted since a comprehensive plan was acknowledged must be addressed in the Periodic Review. In the fall of 1981, subsequent to acknowledgment of the city's Comprehensive Plan, LCDC adopted an Administrative Rule for State Goal 5.

The Archaeological Plan updates the City's Comprehensive Plan inventory and analysis of archaeological resources within the Columbia South Shore planning area and addresses the new Goal 5 Administrative Rule requirements. The Archaeological Plan brings the City into compliance with the terms of its Local Review Order (Resolutions 34523 and 34653) concerning Goal 5 cultural areas.

STATEWIDE PLANNING GOAL 5

Goal 5 requires Oregon cities and counties "to conserve open space and protect natural and scenic resources." The Goal 5 Administrative Rule requires local governments to follow a three-step planning process. This report gives all three steps required by the state.

An inventory of resources is the first step. This involves determining the location, quantity and quality of the resources present. If a resource is not important, it may be excluded from further consideration for purposes of local land use planning, even though state and federal regulations may apply. If information is not available or is inadequate to determine the importance of the resource, the local government must commit itself to obtaining the necessary data and performing the analysis in the future. At the conclusion of this process, all remaining sites must be included in the inventory and are subject to the remaining steps in the Goal 5 process.

The next step is identification of conflicts with protection of inventoried resources. This is done primarily by examining the uses allowed in broad zoning categories. A conflicting use is one which, if allowed, could negatively impact the resource.

If there are no conflicting uses for an identified resource, a jurisdiction must adopt policies and regulations to ensure that the resource is preserved. Where conflicting uses are identified, the economic, social, environmental and energy (ESEE) consequences of resource protection must be determined. Compatibility with other Goal 5 plans and other applicable statewide planning goals must be considered. The ESEE analysis is adequate if it provides a jurisdiction with reasons why decisions are made regarding specific resources.

The final step is adoption of a program or plan to protect significant resources. Based on the inventory and analysis, a jurisdiction must decide whether to allow, limit or prohibit conflicting uses and adopt measures to implement its decisions.

OTHER APPLICABLE STATEWIDE PLANNING GOALS

There are 19 Statewide Planning Goals. Eight of these goals apply, to a greater or lesser extent, to the archaeological plan. Some of these goals establish a decision-making process, such as Goal 1, Citizen Involvement, and Goal 2, Land Use Planning. These procedures were followed for this report.

State Goal 5 is the focus of the present study and is discussed above. Goals 6 through 9 and Goals 11 through 14 cover topics such as air, water and land resources quality; areas subject to natural disasters and hazards; recreational needs; economic development; public facilities and services; transportation; energy conservation; and urbanization. Chapter 9 of this report evaluates the resources inventory and analysis with the requirements of these goals.

Several Statewide Planning Goals do not apply to this Archaeological Plan. Goals 3, 4, 10 and 15 address resources not applicable to the Columbia South Shore (agri lands, forest lands, housing and Willamette River Greenway). Statewide Planning Goals 16, 17, 18 and 19 address coastal and ocean resources and therefore do not apply to the City of Portland.

TRIBAL

Underlying the policies which affect the Archaeological Plan and corresponding regulations are a blend of concepts which make archaeological resources and their protection critically important to the participating Oregon tribes of American Indians. While Chapter 6 discusses specific interests expressed by various tribal members and others, it is important to recognize that broader spiritual, cultural, political and legal forces within the tribes shape the policy framework of the project and give it a distinct form.

The tribal representatives have enriched and strengthened this project and the process by describing these sources of tribal policy and their meaning to this effort. For example, Louie Pitt, Jr., Director of Governmental Affairs and Planning, continually focused the City on spiritual and Indian law basis for resource protection in the Columbia South Shore. Ranging from buried artifacts to wetlands, camas bulbs and wapato, Mr. Pitt, Jr. also gave a clear illustration of the interconnection between the land, its resources and tribal power. Kathryn Harrison, Vice-Chair of the Tribal Council of the Confederated Tribes of Grand Ronde, further explained the spiritual and historical elements of resource protection, including the painful forced removal from these ancestral lands and the importance of the City's efforts to tribal elders like herself. Tribal representatives expertly helped guide the process on a distinct but consistent path from other tribal rights, including the role of treaties, federal law, tribal sovereignty and tribal government in shaping tribal policy.

This document reflects a wide range and complexity of tribal policy influences on the non-Indian legal institution of state land use law. Yet neither this document, the Plan or the rules adopted under state Goal 5 can articulate *tribal* policy for archaeological resource protection. Indeed, tribal policy is the exclusive domain of the tribes, and among tribes specific policies will vary. Many tribes have enacted comprehensive legislation governing archaeological resources. While non-tribal governments such as the City of Portland can create and implement complimentary policies, the City cannot speak for the tribes. Perhaps the best way to describe the tribal element of the project's policy framework is to state the limitations of this project with respect to tribal rights:

The City's plan and ordinances for protecting archaeological resources do not affect or modify any treaty or other right of any Indian tribe, including aboriginal rights.

Viewed from this perspective, the whole of tribal, federal, state and local policies which allow Portland to develop the plan and regulations to protect archaeological resources in the Columbia South Shore are much greater than the sum of each policy area.

LOCAL

THE CITY OF PORTLAND COMPREHENSIVE PLAN

Portland's Comprehensive Plan provides a coordinated set of guidelines for decision-making to guide future growth and development of the city. The Comprehensive Plan is implemented through the use of public facilities and land use policies, the Comprehensive Plan map, and the city's regulations for

development, including the Zoning Code. Since the state acknowledged the city's Comprehensive Plan in 1981, land use decisions in conformance with the policies and objectives of the Plan are in compliance with the Statewide Planning Goals.

The City's long range development objectives for the plan area are stated in Comprehensive Plan Policy 5.10, Columbia South Shore. Policy 5.10 and those Comprehensive Plan policies and objectives most relevant to archaeological resources protection follow:

- **Policy 5.10:** Encourage the development of the Columbia South Shore as an industrial employment center which attracts a diversity of employment opportunities while protecting significant environmental resources and maintaining the capacity of the area infrastructure to accommodate future development.

Comment:

The archaeological resource inventory (Chapter 8) carries forward data that will be evaluated in this policy context. Resource sites, which carry strong social values, will also be evaluated for economic, environmental and energy consequences. (See Chapter 9).

- **Objective 5.10.C.:** Protect and enhance the scenic and environmental qualities of Marine Drive, the area's sloughs, areas providing significant wildlife habitat, and archaeological resources. Adopt a Columbia South Shore Cultural Resources Protection Plan by April 1, 1995." [emphasis added]

Comment:

This Goal 5 report responds to the underlined policy directive. The intended adoption date was not met because the area-wide archaeological investigation was not completed in time and stakeholders have asked for more detailed inventory information. The City's compliance schedule with the Department of Land Conservation and Development has more recently been revised to January 31, 1996. The current public review schedule abides by the revised compliance schedule.

- **Policy 10.13** calls for developing a plan for Portland's frontage along the Columbia River to protect, conserve, maintain, and enhance the scenic, natural, economic, and recreational qualities of Portland's Columbia River bank.

Comment:

This plan identifies the Columbia River frontage as part of the River's Edge sensitivity area. Any future plan for the Columbia River frontage should account for archaeological resource values of the area.

- **Objective 12.8.C.** says to explore the potential to link a community plan's urban design elements and other planning strategies that have been or are being created. Include consideration of open space, scenic, archaeological and historic resources, and environmental areas.

Comment:

The Columbia South Shore plan area is not slated for a new community plan in the near future. But the evaluation phase of this project (Chapter 9) will account for open space, scenic and environmental areas within the impact area.

The Archaeological Plan also affects Comprehensive Plan Goals 1, 2, 5, 6, 8, 9, 10, 11 and 12. These goals address metropolitan coordination, urban development, economic development, transportation, environment, citizen involvement, plan review and administration, and public facilities. As with the State Planning Goals, these procedures are applied in the preparation, review and presentation of this plan. Chapter 9 will discuss the plan's compliance with state and city goals in more detail.

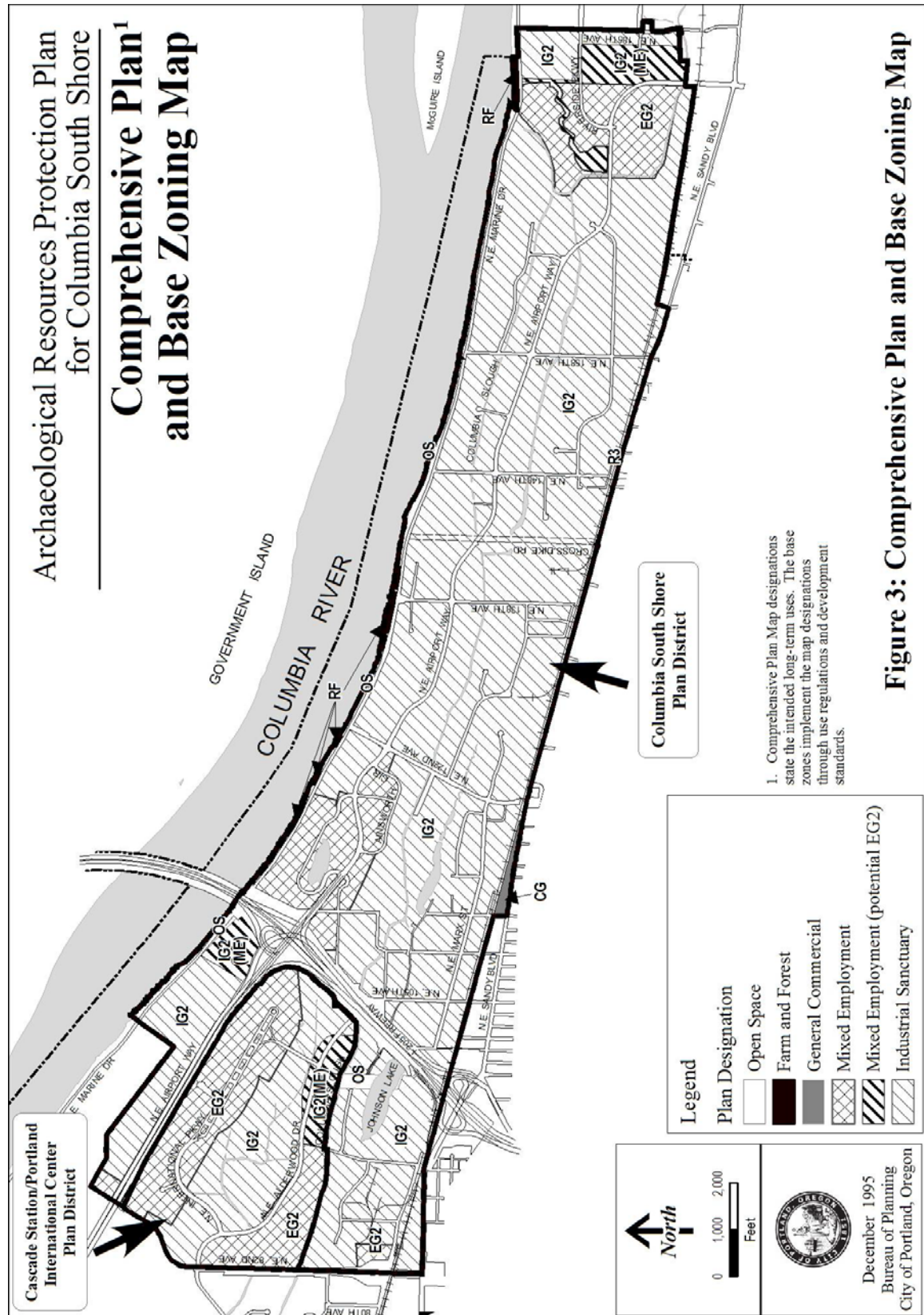
The Comprehensive Plan policies in the plan area are implemented through Comprehensive Plan Map designations and base zones (see Figure 3, page 24), overlay zones (see Figure 4, page 25, for overlay zones which relate to State Goal 5), and the area's plan district. Chapter 10 will discuss and recommend amendments to those implementation measures.

SUMMARY

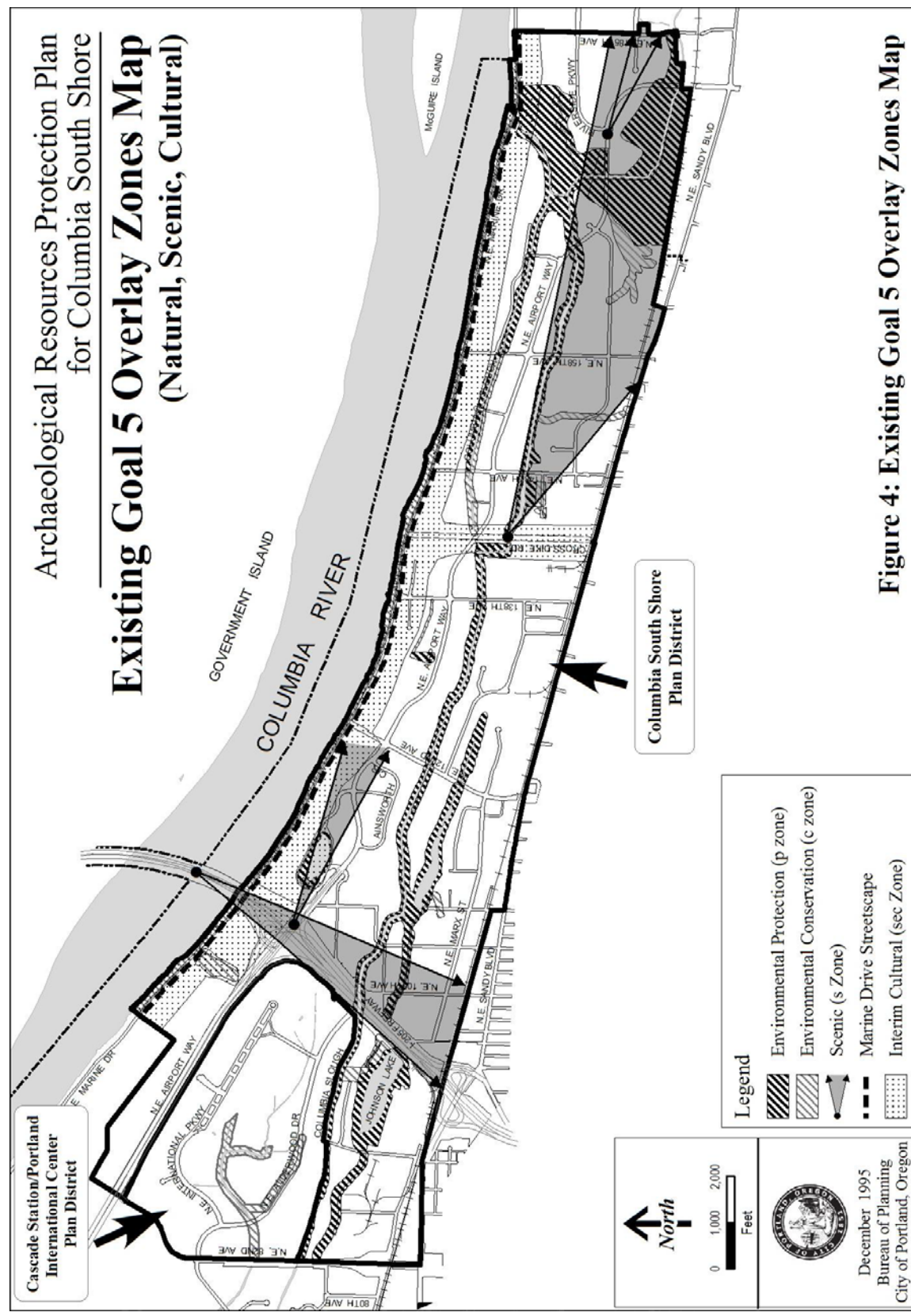
Most of the requirements and public policy statements intended to protect Indian-use sites (archaeological resources) are found in the aboriginal rights of associated tribes, federal statutes and regulations, federal treaties and Executive Orders, and state statutes and regulations. Statewide Planning Goal 5 requires that cities and counties in Oregon prepare inventories, analyze conflicting uses and adopt implementation measures.

Past resource planning efforts in the plan area focused on natural and scenic resources. The policy framework for the present study includes compliance with State Planning Goals (particularly Goal 5) and Portland Comprehensive Plan Goals and Policies.

As of April 3, 1996, the Comprehensive Plan and base zones were as follows:



As of April 3, 1996, the overlay zones were as follows:



CHAPTER 3: GEOLOGY AND GEOMORPHOLOGY

One of the consultant team's first research steps was to identify the plan area in terms of soils and surface features. Geologists from David Newton Associates reviewed historical maps and geotechnical reports from a variety of sources to reconstruct the geologic history and geomorphology of the project area. This information, combined with a reconstruction of vegetation (Chapter 4) and American Indian use patterns (Chapter 5), helped archaeologists to know where to target their fieldwork efforts.

The Columbia South Shore includes the former active floodplain and adjacent fluvial terraces (produced by river action) south of the Columbia River, between Portland International Airport and the Portland-Gresham boundary. This area has been inhabited since prehistoric times by indigenous peoples, and since the nineteenth century by Euroamericans and their descendants. Much of the original native habitat has been obscured by activities since initial historic contact.

The consultants reviewed historical land maps and subsurface data. The maps were prepared by the General Land Office, U.S. Coast and Geodetic Survey, U.S. Geological Survey, and Multnomah County. The consultants reviewed forty-one separate geotechnical reports from the Columbia South Shore vicinity.

OLIGOCENE TO LATE PLIOCENE PERIOD

The Late Cenozoic history of the Portland Basin begins some 20 MYBP (million years before present), when Miocene flood basalts erupted from fissures in what is now eastern Oregon and Washington. For a period of between 10 and 11 million years, basaltic lava flowed west through the ancestral Columbia River Valley to the Pacific Ocean. This volcanic rock is known collectively as Columbia River Basalt (Gilchrist 1974). Columbia River Basalt has been divided into four major groups of more than 30 members or units, each comprised of one or more individual flows (Beeson et al. 1989).

This volcanic rock has been folded into a gentle syncline or downwarp that underlies the Portland Basin. Individual flows range from 15 to 150 feet thick, with the total Columbia River Basalt thickness reaching about 975 feet (Schlicker and Finlayson 1979). The gentle folding that formed the Portland Basin began early in the Pliocene around 10 MYBP (Gilchrist 1974). This folding may have followed a pre-existing weakness in the North American plate margin; the Pliocene Columbia River followed a course similar to the modern Columbia. The persistence of this watergap through the rising Cascade Mountains from

Miocene to Holocene times suggests an underlying or controlling crustal structure.

The Pliocene compression and folding produced a regional north-south trend of highlands and basins. The Willamette and Puget Sound valleys were formed between the Cascade and Coast ranges. This folding also separated the Portland and Tualatin basins by pushing up the Tualatin Mountains, or Portland West Hills. Near the end of this time the Columbia River velocity appears to have been slowed or impounded, leading to the deposition of 1500 feet of fine-grained Sandy River Mudstone (Trimble 1963). A change in depositional conditions occurred before the end of the Pliocene.

From the west end of the Columbia Gorge a sand and gravel delta formed in the Portland Basin. Known as the Troutdale Formation, this material filled the basin with 700 feet of coarse sediment to the height of Mt. Tabor, 640 feet above the present Mean Sea Level (MSL) (Gilchrist 1974). Since the Pliocene this quartzite gravel has been dissected by fluvial activity. The erosional terraces in the Troutdale Formation are referred to as the Eola surface (Balster and Parsons 1968). The Columbia River Basalt and Sandy River Mudstone are not exposed in the Columbia South Shore.

EARLY TO LATE PLEISTOCENE PERIOD

The Early to Late Pleistocene deposits in the Columbia Basin are known as the Portland Gravels, which Trimble (1963) divides into the Springwater, Gresham, and Estacada formations. These deposits consist of rounded basaltic pebbles of 3-inch diameter and smaller, and parallel to occasionally cross-bedded sand. These gravels are probably correlative to the Willamette Valley glaciofluvial Lcomb, Leffler, and Linn gravels of Allison (1953). These gravels are a product of glacial meltwater, both from the continental ice sheet via the Columbia River as well as the Cascade and Coast ranges via the Sandy and Willamette rivers. Higher geomorphic surfaces, such as the Eola, Brateng, and Dolph terraces are formed on these gravels. These gravels are not exposed in the Columbia South Shore.

LATEST PLEISTOCENE PERIOD

During the Latest Pleistocene period, a series of floods deposited fine-grained sand and silt sediment in the Portland area. The Missoula Floods (15,000 to 13,000 BP) are believed to have deposited Quaternary and the Blue Lake Gravels. Ice-dam impoundment in the late stages of this event may have produced the

sands and silts found at the top of the catastrophic flood sediments (Allison 1978).

The middle geomorphic surfaces--the Brateng, Bethel, Calapooyia, Senecal, and Champoege terraces--are depositional or erosional features on this Pleistocene material. The Calapooyia and Senecal surfaces are associated with catastrophic flooding (McDowell 1991). In the Portland Basin, these surfaces are found between 200 and 350 feet MSL, south of the Columbia South Shore.

These surfaces are present beneath the Columbia South Shore, and may outcrop where the Holocene alluvium has been removed. It is unclear whether the upper Troutdale units identified by Bet and Rosner (1993) are actually of Pliocene age. These units may represent a proximal facies of the Willamette Formation. This assignment would conform better to the young Ingram and Horseshoe geomorphic surfaces identified in the Blue Lake Park area studied by Bet and Rosner (1993).

HOLOCENE PERIOD

With the melting of continental glaciers, sea level has risen at least 55 meters (180 feet) over the last 10,000 years (Hutchinson 1992:86). As the Columbia River was formerly at sea level as far upstream as The Dalles (sea level today extends only as far upstream as Bonneville Dam), the position of the river and associated streamside landforms suitable for human occupation were much lower than today. Sea level rose quickly between 10,000 and 7000 years ago to -10 meters. Sea level rise after that time was more gradual, and was about -4.5 meters 5,000 years ago and -1 meter 2,000 years ago (Hutchinson 1992).

During this period of sea level rise the Portland Basin was affected by a fairly complex interaction between 1) sea level rise, 2) regional subsidence by continued downwarping, 3) basin river sediment infilling, and 4) tilting and uplift of the Cascade Range. As of this date no geologic investigators have clarified or isolated the effects of these four processes on the geomorphology of the Portland Basin.

It has been estimated that the Cascade Range has undergone 1200 meters (approximately 4,000 feet) of uplift over the last six million years (Beeson et al. 1989; Yeats et al. 1991). Given this average of 2 millimeters a year, a total uplift for the Cascades of 20 meters (66 feet) over the last 10,000 years is not unlikely. For the last 5,000 years, the earth's crust along the Columbia River in the Portland Basin has been relatively stable.

Over the past 6,800 years, floods have deposited 12 to 18 meters (40 to 60 feet) of deposits. This information comes from core samples on Sauvie Island, which measured the depth of volcanic ash from Mount Mazama. Approximately 20 meters (66 feet) of "overbank" sediments of Holocene age have been reported along the Columbia South Shore (Hartford and McFarland 1989). It is unclear what combination of basin subsidence, sea level rise, and flood highstand elevations this deposition represents without better age date control of these overbank sediments.

The modern Columbia River has reworked the pre-Holocene and Recent sediments, forming an active floodplain that is present as stabilized channels and river bars, such as Government Island. These sediments consist predominantly of gravel below sand and silt. Below the Calapooyia and Senecal terraces, three geomorphic surfaces of Holocene age have been recognized: the Winkle, Ingram, and Horseshoe terraces (see Figure 5).

The oldest surface, Winkle, is estimated to date between 35,000 and 5000 before present (Balster and Parsons 1968:8-9). This surface appears to be present as a lateral terrace between 50 and 100 feet MSL between Parkrose and Fairview. The cross-section in Bet and Rosner (1993:63) shows this surface as incised on the upper Troutdale units (or possibly the proximal Willamette Formation, as noted above) with a veneer of Missoula flood gravels.

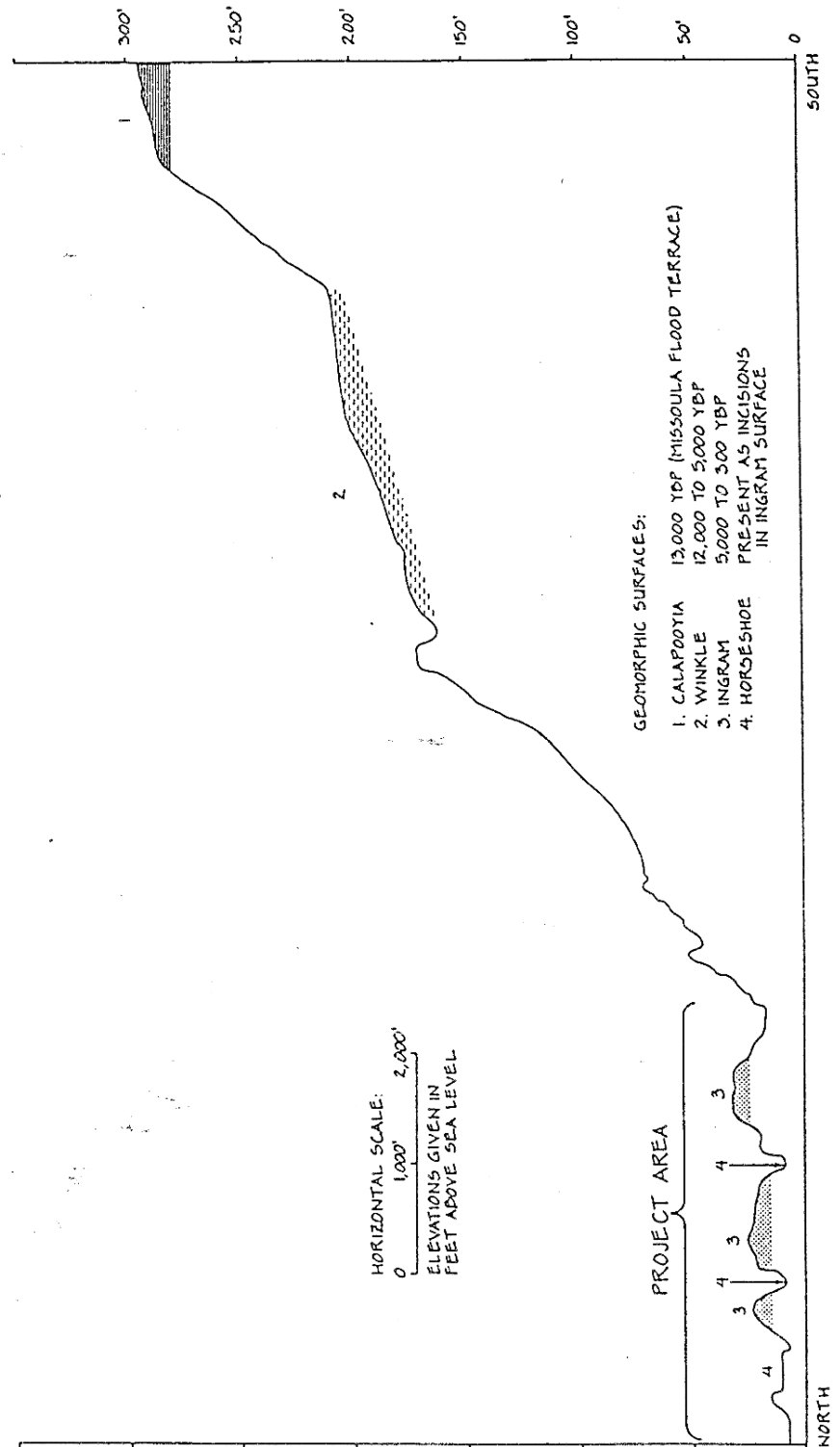
Identification of this surface as the Winkle terrace suggests that the lower surface, from elevation 50 feet to the present Columbia River elevation of 10 feet (mean sea level), is the Ingram Terrace, estimated to date between 5000 and 550 BP in the Willamette Valley (Balster and Parsons 1968:9). The Horseshoe surface would then be represented by the incised slough and its tributary channels, as well as the active river islands. This lowest surface must have undergone periodic superficial reworking during annual flooding.

Soils associated with the Ingram and Horseshoe surfaces are generally younger than the very mature soils found on the higher landforms in the area (Green 1983). Typical soils found on the Ingram surface are Quatama soils (Aquultic Haploxeralfs, alfisols, soils formed in volcanic sediments) and Sauvie soils (Aquolls, soils of moderate age with a thick dark topsoil layer). Argillic (clay-rich) horizons and thick organic surface horizons in these soils indicate a longer period of soil development than the juvenile, less well-developed soils of the Horseshoe surface.

According to an early Multnomah County soil survey (ca. 1919), the plan area had three major soil groups. The soil groups included: 1) Columbia fine sand (adjacent to the Columbia River); 2) Cascade silt loam (on upland areas); and 3) Sauvie silty clay loam (in marsh and meadow areas).

Figure 5. Cross-section of the south bank of the Columbia River showing location of geomorphic surfaces.

Figure 5 CROSS-SECTION OF SOUTH BANK OF COLUMBIA RIVER



Hydrologic data for pre-dam flood events on the Columbia River is shown on Table 1. Hydrology was derived from maximum annual discharge for the Vancouver area (River Mile 106.5) using gauge information in The Dalles from 1879 to present as well as a "pre-dam" river model. The plan area, located at elevations of 30 feet or less, experienced seasonal floods.

Table 1. Summary of Flood Data in the Portland Basin.

Maximum Annual Discharge	USGS Datum (FT) ¹	PDX Datum (FT)
1 Year Freshet ²	17.0	18.5
2 Year	23.5	25.0
5 Year	27.5	29.0
10 Year	29.0	30.5
20 Year	32.0	33.5
50 Year	33.0	34.5
100 Year	35.0	36.5
200 Year	35.5	37.0
500 Year	38.0	39.5
1000 Year ³	38.5	40.0

Source: Doug Speers, U.S. Army Corps of Engineers

1 Reference to elevation in this report will be made in terms of USGS datum

2 Difficult to estimate due to tidal influence and model information

3 1894 flood

SUMMARY

Portland area geology extends at least into the Middle Cenozoic when the flood basalts of the Columbia River Basalt Group poured west through the rising Cascade Range to form the basement rocks of the Portland Basin. Erosion and deposition on the ancestral Columbia River and its tributaries cut into a series of geomorphic surfaces into the resulting landscape.

The surface of the Portland Basin (including the plan area) was established by the latest of the great Missoula Floods about 13,000 years ago. These colossal floods broke loose when glacial meltwater lake ice-dams failed. More recent floods reshaped the basalts and sediments of the Portland Basin, producing a further series of land surfaces. The youngest of these surfaces is present on the Columbia South Shore in the Ingram surface, an erosional feature 3000 to 5000 years old. This surface is formed in Missoula Flood sediments with a veneer of Recent alluvium at elevations between 15 and 30 feet MSL. Portions of the

Ingram surface may also contain older Troutdale materials. Ingram deposits vary in age from 3300 to 550 years BP.

The other geomorphic surface present on the South Shore is the Horseshoe. The Horseshoe surface, with average elevations of less than 10 to 15 feet, is estimated to be less than 500 years old. This surface is generally associated with the marshes, meadows, sloughs, and tributary channels of the Columbia River.

Sea-level data suggest that the level of the Columbia River rose approximately five meters (16.5 feet) over the last 5000 years. Evidence of activities by American Indians that were centered on marsh or river shorelines during this period will be deeply buried or lost by erosion.

Older landforms at elevations above 25 feet MSL, such as those on the Ingram surface, were probably inundated only during flood events. These landforms would have represented "uplands" during earlier time periods. Evidence of prehistoric occupation may be anticipated in topographic settings where Indian activity was recorded by Euroamerican visitors. This evidence, where it survives, may be buried beneath several centimeters to several meters of alluvial silts and sands produced by past flood events.

CHAPTER 4: NATIVE VEGETATION COMMUNITIES

The consultant team prepared a botanical framework that, when combined with geomorphic landform mapping, reconstructs the vegetation community patterns thought to have been present before the onset of significant Euroamerican land-use impacts in the nineteenth century. The reconstruction of native plant assemblages must take into account regional climatic change over time, the geomorphic setting, periodic disturbance, and ultimately the impacts both American Indians and Euroamericans have had on the landscape. Plant assemblages historically occurring in the project area (given the likely moisture regime, and degree and frequency of disturbance from flooding and fire) may be surmised with some likelihood by observing existing native communities in relatively undisturbed habitats, while additionally noting observations from early Euroamerican travelers in the region. Use of plant materials likely to have been found in the project area prior to European contact is discussed within the context of such reconstructed plant communities.

REGIONAL INFLUENCES ON PRE-SETTLEMENT VEGETATION COMMUNITIES

The Columbia South Shore lies within the Western Hemlock zone, a group of forest species associations that dominates most of the lower elevations (below 3000 feet) of western Oregon and Washington between the Cascade and Coast ranges (Franklin and Dyrness 1973). Given sufficient time and in the absence of disturbance, upland forests in this zone eventually will become dominated by western hemlock, since this species is shade tolerant and able to reproduce under a heavy forest canopy. However, the typical forested environment is subject to a variety of impacts unrelated to human influences, such as fire, landslides, diseases, and storms. The dominant conifer species in the area, Douglas fir, can readily colonize disturbed sites and, given suitable conditions, can live at least 500 years. Consequently, few sites remain undisturbed long enough for western hemlock to truly dominate. A discussion of past climatic trends in the region is best undertaken using Douglas fir as the dominant species within the Western Hemlock zone forests.

Climate changes and their effects on plant communities over time have been reconstructed through the use of fossil pollen records and computer modeling of global atmospheric patterns. Paleoclimatic simulations have provided physical mechanisms that help explain the changing vegetation assemblages as revealed by pollen studies (Brubaker 1991).

The Pacific Northwest experienced dry and cold conditions during the maximum extent of the last continental glaciation (lasting from approximately 30,000 to 18,000 BP) due to a strong high pressure system centered over the continental ice sheet. Vegetation west of the Cascade Mountains was dominated by an open forest-tundra parkland type dominated by lodgepole pine, Englemann spruce, and mountain hemlock interspersed with low tundra communities.

The continental ice sheet had largely collapsed by approximately 10,000 BP, most likely due to changes in the earth's orbital status that favored greater solar radiation levels in the summer months. Warm dry summers became the norm, with pollen records in the southern Puget lowlands indicating that oak savannah and grassland were the dominant cover types, with dry Douglas fir woodlands more common to the north. These conditions are somewhat analogous to the oak savannah/Douglas fir forest communities presently common in southwest Oregon.

More mesic tree species, such as western hemlock and western red cedar, are quite rare in the pollen record, while bracken fern spores and charcoal became common in sediments. Long droughty periods conducive to periodic fire helped maintain the open savannah-grassland communities, since fire-susceptible tree and shrub seedlings were seldom able to reach reproductive maturity.

Pollen studies conducted in the region suggest that modern forest composition was becoming established within the last 5000 to 6000 years (Hebda and Mathewes 1984; Barnosky 1981, 1985). Douglas fir, western red cedar, and western hemlock pollen all increased in the southern Puget lowlands, suggesting a transition to more mesic plant communities. In addition, decreases in charcoal and bracken fern spores indicate less frequent fires, which increasingly favored the establishment and spread of fire-sensitive species such as western red cedar and western hemlock. These changes strongly indicate a trend toward a cooler and moister climate, similar to present-day conditions. Climatic cooling during this period has been additionally confirmed by the measured expansion of mountain glaciers, as well as by paleoclimatic computer modeling (Brubaker 1991). Regional climatic fluctuations within the last 5000 years or so do not appear to have been prolonged or severe enough to significantly change plant community composition.

Regional vegetation patterns have largely been shaped by climatic factors, though in less physically stable environments such as flood plains, geomorphic and hydrologic forces exert a proportionately greater influence. Inundation of lowlying ground during seasonal and catastrophic flood events brings into play several factors affecting vegetation patterns and survival. Scouring from fast moving water may carry topsoil and uprooted plants downstream. Silt may settle out of temporarily ponded water, creating new growing surfaces readily

colonized by early seral ("weedy") species. Long term inundation stresses those species without effective adaptations to anoxic soil conditions, thereby favoring certain hydrophytic (water-loving) plant assemblages. Since these factors are never constant from one flood event to the next, flood plains are by nature dynamic and seldom develop plant communities of later seral stages, unless in more upland, relatively stable landscape positions.

In the Columbia South Shore, seasonal flooding due to snowmelt runoff in early summer has had the greatest influence on vegetation within the last few thousand years, with the exception of the occasional larger (i.e., 100-year or greater) flood event. Nevertheless, annual non-catastrophic flooding still ensures that plant communities will vary somewhat in location and species composition over time.

PRE-SETTLEMENT PLANT COMMUNITIES

Early accounts by European and Euroamerican travelers provide some insight into the vegetation community structure of the Columbia South Shore, though botanically-trained visitors were primarily involved in describing individual species unknown in other regions. Nevertheless, their observations occasionally give some idea of the communities they encountered, and often provide information regarding plant use by Indians.

Botanical exploration of the Columbia River Valley essentially began with the passage both down and upriver by the Lewis and Clark expedition in 1805-1806. An earlier visit by Broughton (of Vancouver's 1792 voyage) penetrated upriver to at least Washougal. However, his observations contain little of botanical interest. Lewis and Clark, on the other hand, often described the dominant and unique vegetation of areas they passed through, as well as the use of these plants by Indians. In the passage quoted below, Lewis described the area in the vicinity of the Columbia South Shore on April 2, 1806:

Fir is the common growth of the uplands, as is the cottonwood, ash; large leafed ash [bigleaf maple, *Acer macrophyllum*] and sweet willow that of the bottomlands. the huckleberry, shallon [*Gaultheria shallon*], and the several evergreen shrubs of that speceis which bears burries [*Vaccinium ovatum*?] have seased to appear except that speceis which has the leaf with a prickly margin [*Berberis* sp.]. among the plants of this prarie in which we are encamped I observe the passhequo [*Camassia quamash*], Shannetahque [*Cirsium edule*], and compound firn [*Pteridium aquilinum*] the roots of which the natives eat; also the water cress [*Rorippa nasturtium-aquatica*], strawburry [*Fragaria* sp.], flowering pea not yet in blume [*Vicia americana* ?], the sinquefoil [*Potentilla anserina*], narrow dock [*Rumex*

salicifolius], sand rush [*Equisetum arvense*], which are luxuriant and abundant in the river bottoms; a species of the bearsclaw of which I preserved a specimen it is in bloom. the large leafed thorn [*Rubus spectabilis*] has also disappeared. the red flowering currant [*Ribes sanguineum*] is found here in considerable quantities on the uplands. the hunters inform me that there are extensive prairies on the highlands a few miles back from the river on this side. the land is very fertile (Moulton 1991:55).

In his journal entry for April 5, 1806, William Clark repeated Lewis' observations, and added that "The Country on either side is fertile, the bottom on the South Side is wide and interspersed with Small ponds in which the natives gather their wappato [*Sagittaria latifolia*]" (Moulton 1991:77).

David Douglas, an English botanist who spent several years in the region in the mid-1820s, used Fort Vancouver as a base for regular forays. During a trip on August 19, 1825, he noted that between the Columbia and Willamette Falls the banks of the Willamette River were "covered with *Pseudotsuga menziesii*, *A. balsamea* [*Abies grandis*], oak and poplar [presumably *Populus trichocarpa*]" (Davies 1980:46). These species were likely common in the Columbia South Shore flood plain as well.

General Land Office (GLO) survey records have proven useful in reconstructing the likely pre-settlement vegetation cover, since the land was still relatively unaltered by Euroamericans in the 1850s. The surveys were conducted to delineate townships and sections for subsequent settlement via Donation Land Claims. During the surveys, the size and species of site trees, location of streams and water bodies, and other details were noted as the surveyors established section boundaries. Distances along section lines where the surveyors crossed particular landscape features were noted in chains (66 feet each) and links (7.92 inches each), with bearings given to individual trees (Habeck 1961). This information is limited by the differing skill levels of individual surveyors, as well as the inability in some cases to see the broader landscape features, which were often obscured by heavy vegetative growth or irregular terrain. Nevertheless, their observations can be transferred to map reconstructions of pre-dike landforms to show areas dominated *at that time* by certain broad cover types (such as forest/scrub-shrub, wet and dry prairie, or open water).

Joseph Hunt's (1852) general comments concerning the township (T1N, R2E) encompassing the Columbia South Shore included:

"Surface of township is gently rolling. Soil in south half is very dry and gravelly. Soil in north half is mostly rich alluvial bottoms, which are considered very valuable for pasturage. They are inundated to the depth

of several feet by the rising of the Columbia River in the month of June. This lasts for about two weeks when the river gradually subsides..."

The timber on the upland is fir, maple, hemlock--a large proportion of which has been killed by fire. On the bottoms balm of Gilead [black cottonwood], willow, ash, crabapple, thorns, etc.

Cartee (1854) describes the adjacent township (T1N, R3E) in much the same manner, not surprising given its similar landscape position. His mention also of the recently burned upper terrace implies an extensive burned-over area, though this did not appear to extend downslope onto the flood plain. It is unclear whether the bottomlands may have been too wet at the time to burn, or if the extensive grasslands had burned and already recovered by the time of survey.

An additional survey conducted some time between 1854 and 1857 in the vicinity of NE 158th Avenue indicated that the land was "nearly level--Timber & prairie bottoms--Timber fir, cedar, dogwood, Ash, Oak, Hemlock &c. Undergrowth Hardhack [spiraea], vine maple, Hazel & Rose" (Anonymous n.d.:44). A broad "oak ridge" was also referred to within an extensive grass prairie (Anonymous n.d.:41). Mention of "fir" in the bottomlands was otherwise absent from the survey notes of other surveyors, most likely indicating that relatively small "islands" of upland within the floodplain actually supported such species as Douglas fir and white oak. These species were generally more common on the slopes rising to the south of the flood plain.

CURRENT VEGETATION CONDITIONS

Once Euroamerican settlement of the Columbia South Shore began in the 1840s and 1850s, plant communities became increasingly impacted through clearing activities aimed at increasing agricultural production. Nevertheless, the flood plain was still subject to annual spring freshets which postponed planting of crops until late June at the earliest; most of the bottomlands were therefore useful only for grazing cattle (Ellis 1992a:7).

In 1917, the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation collaborated to form the Multnomah County Drainage District No. 1. By 1920, the drainage district had built an extensive ditch system and dikes along the Columbia River. By 1950, the dikes had been raised twice, the last in response to the 1948 Vanport flood. Drainage of the floodplain protected by the dikes likely began before 1940 and increased significantly following World War II (Ellis 1992a:8). Impacts to plant communities through annual flooding were now

eclipsed by human disturbance, grazing animals, and by the invasive growth of introduced plants.

It is possible that plant communities entirely composed of native assemblages no longer exist in the plan area. Manipulations of water levels, widespread grazing, and infestations by such species as Himalayan blackberry (*Rubus discolor*) and reed canarygrass (*Phalaris arundinacea*) have killed off many native species, both in wetland and upland areas. Other lands are under active cultivation or within industrial or residential zones that have been heavily impacted by paving, excavation, and other landscaping.

PROBABLE NATIVE PLANT ASSEMBLAGES

Native wetland plant communities found in the Columbia South Shore in pre-settlement times may be extrapolated to some extent from recent descriptions of relatively undisturbed communities in the Lower Columbia River Valley and nearby areas of Northwest Oregon and Southwest Washington (Christy 1993). Given the dynamic nature of riparian and wetland areas, historic plant assemblages most likely were well adapted to periodic disturbance and contained a similar complement of dominant species.

Accounts of certain species assemblages from early Euroamerican visitors (especially those of Meriwether Lewis and David Douglas) give some indication that the following community types were most likely present within the Columbia South Shore, since each is described from relatively undisturbed sites in the Lower Columbia River Valley region. Estimation of the relative landform position of these communities, however, must rely on a combination of geomorphic mapping and historic water level records to provide likely growing conditions at any particular location. For instance, Columbia River flood discharge data provided by the U.S. Army Corps of Engineers indicate that elevations above approximately 20 feet are generally not subject to annual spring flooding, though sporadic flood events still attain higher levels (see Table 1, page 31). Elevations well above 20 feet were generally relatively stable, with a dominance of dry prairie and upland forest communities.

1. Forested Upland Communities

Early accounts (i.e., Lewis and Clark, David Douglas, GLO surveys) indicate that forested upland dominated the south bank and upper terrace of the Columbia South Shore. In these environments seasonal flooding had a minor influence on species composition; the plants were generally not adapted to prolonged soil saturation or inundation conditions common in the bottomland areas.

Douglas fir dominated the upland forests of the south bank. Other species found in the area included western hemlock, grand fir, western red cedar, bigleaf maple, and Oregon white oak. Common understory shrubs included salal, Oregon grape, red elderberry, hazelnut, vine maple, Indian plum, red flowering currant, and Pacific blackberry. Upland herbaceous species included sword fern, bracken fern, fireweed, strawberry, and fringe cup, among others. In areas where the dominant overstory trees had been removed by fire, wind, or landslide activity, openings would initially be dominated by weedy herbaceous species and shrubs.

2. Grassland Communities

Grassland communities may be designated as wet or dry prairies or meadows, varying with moisture levels and soil types. In some instances, they comprise wetland systems and are included in the communities described below. Grasses are generally the dominant cover type, although trees, shrubs, and forbs often occur within the grassland complex. The composition of these grassland communities is largely conjectural, due to the nearly total lack of comparable native grassland communities in the Willamette Valley and elsewhere in the region, but typical grasses were likely to have been perennial species such as certain fescues that would have supplied year-round forage (Franklin and Dyrness 1973). A grassland forb of primary interest to the Chinookans in the area was the common camas (*Camassia quamash*), a plant preferring wet prairie habitats that dry out by early summer.

3. Riparian Communities

The riparian zone in the Columbia South Shore is comprised of habitats along slough and river banks, as well as along the shorelines of other water bodies such as lakes, ponds, and marshes. These habitats may be subjected to periodic flooding, and in certain instances the distinctions between riparian and wetland are very fine. Black cottonwood, Oregon ash, and willows generally dominate the overstory in these areas, occasionally with bigleaf maple or red alder as co-dominants. Oregon white oak, Douglas fir, and grand fir may occur in drier areas, especially along the outer terrace bank above the flood plain proper.

4. Wetland Communities

Bottomland communities often occur within wetland systems, and can be broadly categorized using two distinct community-based systems (after Cowardin et al. 1979 and Christy 1993). Using Cowardin's wetland classification system, communities in the Columbia South Shore can be broadly categorized as palustrine forested (PFO-), palustrine scrub/shrub (PSS-), palustrine emergent (herbaceous) (PEM-), and palustrine aquatic bed (PAB-). Palustrine refers to all

freshwater environments not otherwise considered lacustrine or riverine, which includes such areas as marshes, ponds generally smaller than 20 acres, and seasonally saturated low ground. Christy has further cataloged native plant communities by region and dominant plant species. These assemblages are based on extensive literature reviews and field observations; communities currently dominated by introduced invasive species are not included here.

a. PFO/RIP] Palustrine Forested Wetland and Riparian

These communities occurred in the bottomlands and were dominated by black cottonwood (*Populus trichocarpa*), Oregon ash (*Fraxinus latifolia*), red alder (*Alnus rubra*), and Pacific willow (*Salix lasiandra*). Understory shrubs probably included red-osier dogwood (*Cornus stolonifera*), other willows (*Salix* spp.), western crabapple (*Pyrus fusca*), salmonberry (*Rubus spectabilis*), and on drier sites, snowberry (*Symphoricarpos albus*). Herbaceous species included stinging nettle (*Urtica dioica*), slough sedge (*Carex obnupta*), orange balsam (*Impatiens capensis*), and water parsley (*Oenanthe sarmentosa*).

These communities were most common in areas bordering the sloughs or other slightly elevated ground, since such positions were generally better drained and provided suitable growing conditions soon after the spring floods. Oregon ash, Pacific willow, and red-osier dogwood are among species that are better adapted to prolonged inundation than black cottonwood, and could occupy lower landscape positions, provided drainage still occurred by early summer. The cottonwoods require better drainage or at least more consistently exposed roots, as along the edge of a slough.

b. PSS] Palustrine Scrub/shrub Wetland

These communities probably included such woody species as Douglas spiraea (*Spiraea douglasii*), red-osier dogwood (*Cornus stolonifera*), Nootka rose (*Rosa nutkana*), willows (*Salix fluviatilis*, *S. lasiandra*, *S. sitchensis*), and black twinberry (*Lonicera involucrata*). Herbaceous species included water parsley (*Oenanthe sarmentosa*), tufted hairgrass (*Deschampsia caespitosa*), and skunk cabbage (*Lysichitum americanum*).

These communities can endure some flooding or shallow groundwater levels, though a riparian willow-dominated community is better adapted to scouring and plant loss followed by rapid resprouting from uprooted or buried fragments. River willow (*Salix fluviatilis*) stands are common along the south channel of the Columbia, on gravel bars and islands, with Pacific willow (*S. lasiandra*) more common along the sloughs and in swampy areas throughout the flood plain.

c. [PEM] Palustrine Emergent Wetland

Forb- and graminoid-dominated fens, marshes and wet prairies likely included most of the following species: beggars-tick (*Bidens cernua*), Columbia sedge (*Carex aperta*), dense sedge (*Carex densa*), spikerush (*Eleocharis palustris*), water purslane (*Ludwigia palustris*), water smartweed (*Polygonum hydropiperoides*), knotgrass (*Paspalum distichum*), tufted hairgrass (*Deschampsia caespitosa*), and wapato (*Sagittaria latifolia*).

Species likely found on the shores of pools and ponds include the following dominants in addition to those previously mentioned: slough sedge (*Carex obnupta*), beaked sedge (*Carex rostrata*), water parsley (*Oenanthe sarmentosa*), hardstem bulrush (*Scirpus acutus*), small-fruited bulrush (*Scirpus microcarpus*), burreed (*Sparganium emersum*), and cattail (*Typha latifolia*).

Extensive wet prairie and marsh areas were present historically; primary emphasis in early accounts was given to wapato-dominated marshes frequently used by Indians.

d. PAB] Palustrine Aquatic Bed Wetland

Floating/Submerged communities in deeper ponds may have included these dominants: watershield (*Brasenia schreberi*), hornwort (*Ceratophyllum demersum*), broad waterweed (*Elodea canadensis*), duckweed (*Lemna minor*), spatterdock (*Nuphar polysepalum*), and floating-leaved pondweed (*Potamogeton natans*). Such deeper water areas contained fewer food plants, though plant materials were attractive to certain fish, waterfowl, and mammals potentially utilized by Indians.

PLANT USE BY AMERICAN INDIANS

Plant communities found in the Columbia South Shore were used extensively by indigenous peoples, most recently by Upper Chinookan groups. Members of currently existing tribes still collect plants and their fruits in the Columbia South Shore area. Evidence linking known habitation and specific use of plants by the Chinookans in the area can be drawn from official diaries of early Euroamerican explorers, accounts of use by American Indians, and from archaeological excavations in the project area.

Archaeological evidence of plant use within the Columbia South Shore has generally been limited to descriptions of charred organic remains recovered during excavations (Prouty 1989; Stenholm 1992a, 1992b, 1993). The most common preserved materials have been wood used as a fuel source (primarily

Douglas fir) and nut shells or root/bulb fragments (hazelnut, wapato, camas) used for food. Long-term wet soil conditions, physical removal during flood events, and burial within silt deposits and recent fill has likely limited the specificity and availability of further botanical samples.

Documented accounts of specific plant use by Chinookans in the Lower Columbia Valley have been included in anthologies that may group several culturally distinct peoples together (i.e., Gunther 1973; Turner 1979). Often, the inclusion of certain food plants in the vocabulary and lore of a certain group and not in another did not imply that the plant was not used by the latter, but simply that its use did not elicit strong favor or warning in tribal language. Much of the difficulty of reconstructing Chinookan use of plants stems from the fact that, due to disease and assimilation, traditional lifeways had largely ended before intensive ethnographic studies were undertaken. Consequently, the journals of Lewis and Clark and David Douglas (among others) generally provide the most useful information regarding native uses of some species before Euroamerican settlement.

Chinookan-speaking peoples inhabited the Columbia River corridor from the coast inland as far east as The Dalles. The Chinookans traveled extensively and traded with a number of other groups, regularly meeting at The Dalles to trade with interior peoples. Although Chinookan subsistence was based to a large extent on salmon, plants were nevertheless of considerable importance. Certain species were necessary for subsistence, especially when fish runs were scarce. Other plants were relied on for shelter, implements, medicines, and as trade items. Wapato (*Sagittaria latifolia*) was especially valuable in trade with other groups, often those from interior regions. Plants that were probably utilized in the area (for food, clothing, building materials, medicine, etc.) are listed in Table 2, at the end of this chapter.

SUMMARY

Despite the lack of resemblance to the pre-settlement condition, certain existing landforms and plant communities may hold clues to the locations of prehistoric settlements. Likely sites for native occupation include upland benches or knobs that remained relatively dry through the intended length of stay, whether seasonal or year-round. Permanent camps obviously required the more upland protected settings. Upland areas now dominated by cottonwood forest or by open grassland may have had appeal for protection from flooding and prolonged soil saturation, and from wind where forested.

Seasonal camps may have been established in most any non-wetland area. Proximity of settlements to the river or connecting sloughs was especially

important, given the reliance of these people on canoe access for fishing and hunting, movement of trade goods, transport of building materials, and general mobility. The shorelines of lakes and ponds were close to extensive wapato beds or to canoe routes; these areas potentially were the locations of short-term camps, even though subject to seasonal flooding. However, in assessing the potential of any locality for containing evidence of Indian occupation, care must be taken to consider changes in landforms due to the deposition of dredge spoils or other fill materials, requiring comparison with mapping of pre-dike landscape conditions.

Seasonal campsites served as an extension of the village. Just as European farming units contained a house and farmland within a given ownership, so the Indian use area contained one or more houses and seasonal campsites for resource extraction. In this way, the "house" need not be situated in the middle of the land to designate use and permanence. Both Indian and European settlement types relied on a residential structure and a land base to provide life-sustaining resources. Viewed in this light, seasonal campsites were a significant part of Indian community lifeways.

Table 2. Native Plants Potentially Used in the Columbia South Shore by Indians.

Species	Common Name	Family	Habitat Type	Potential Usage	Sources
TREES/SHRUBS					
<i>Acer circinatum</i>	vine maple	Aceraceae	FOR/UPL	wood-fishing hoops, etc.	1,7
<i>Acer macrophyllum</i>	bigleaf maple	Aceraceae	FOR/UPL/RIP	wood, leaves	2,6,7
<i>Alnus rubra</i>	red alder	Betulaceae	PFO-, PSS-, UPL	leaves, bark, wood	4,5
<i>Amelanchier alnifolia</i>	western serviceberry	Rosaceae	UPL	fruit	3,6
<i>Berberis nervosa</i>	Oregon grape	Berberidaceae	FOR/UPL	fruit	3,6
<i>Cornus stolonifera</i>	red-osier dogwood	Cornaceae	PFO-, PSS-	baskets, salmon stretc	4,6,7
<i>Corylus cornuta</i>	hazelnut	Betulaceae	UPL	nuts	3,6
<i>Crataegus douglasii</i>	Douglas' hawthorne	Rosaceae	PFO-, PSS-, UPL	fruit	3,6
<i>Fraxinus latifolia</i>	Oregon ash	Oleaceae	PFO-, PSS-	leaves, bark, wood	4
<i>Gaultheria shallon</i>	salal	Ericaceae	UPL	fruit	3
<i>Holodiscus discolor</i>	oceanspray, ironwood	Rosaceae	UPL	wood (digging sticks)	6,7
<i>Lonicera involucrata</i>	black twinberry	Caprifoliaceae	PFO-, PSS-, UPL	fruit	3
<i>Philadelphus lewisii</i>	mock-orange	Hydrangeaceae	UPL	wood implements, soap	7
<i>Populus trichocarpa</i>	black cottonwood	Salicaceae	PFO-, PSS-RIP	firewood, inner bark	3,4,6
<i>Pseudotsuga menziesii</i>	Douglas fir	Pinaceae	UPL	firewood, implements, medicinal	3,6
<i>Pyrus</i> [= <i>Malus</i>] <i>fusca</i>	western crabapple	Rosaceae	PFO-, PSS-, UPL	fruit	2,3
<i>Quercus garryana</i>	Oregon white oak	Fagaceae	UPL	acorns, wood	3
<i>Ribes</i> sp.	currants/gooseberries	Grossulariaceae	RIP, UPL	fruit	3,6
<i>Rosa</i> sp.	rose spp.	Rosaceae	PSS-, RIP, UPL	fruit (limited use)	3,6
<i>Rubus spectabilis</i>	salmonberry	Rosaceae	PFO-, PSS-, RIP	young shols, fruit	1,2,3,4,5,6
<i>Rubus parviflorus</i>	thimbleberry	Rosaceae	UPL	fruit	3,6
<i>Rubus ursinus</i>	California blackberry	Rosaceae	UPL, RIP	fruit	3
<i>Salix lasianдраfluviatilis</i>	willow	Salicaceae	PFO-, PSS-RIP	implements, baskets, etc.	3,4
<i>Sambucus cerulea/racemosa</i>	blue/red elderberry	Caprifoliaceae	UPL, RIP	fruit, medicine/tea	2,3,4,6
<i>Thuja plicata</i>	western red cedar	Cupressaceae	PFO-, UPL	canoes, structures, clothes	1,3,5
<i>Tsuga heterophylla</i>	western hemlock	Pinaceae	UPL	needles, inner bark	3,6
<i>Vaccinium parvifolium</i>	red huckleberry	Ericaceae	UPL	fruit	3
FORBS/GRAMINOIDS					
<i>Achillea millefolium</i>	western yarrow	Compositae	UPL	medicine	2
<i>Allium</i> sp.	wild onion	Liliaceae	PEM-, UPL	bulbs	2,3,6
<i>Beckmannia syzigachne</i>	sloughgrass	Gramineae	PEM-	seeds	3
<i>Brasenia schreberi</i>	water shield	Nymphaeaceae	PAB-	tubers, leaves	3
<i>Camassia quamash</i>	common camas	Liliaceae	PEM-, UPL	bulbs	2,3,5,6

Table 2 (continued).

Species	Common Name	Family	Habitat Type	Potential Usage	Sources
FORBS/GRAMINOIDS (continued)					
<i>Cyperus</i> sp.	nutsedge	Cyperaceae	PEM-	tubers	1,3,5
<i>Epilobium angustifolium</i>	fireweed	Onagraceae	UPL	shoots, leaves, pith	3
<i>Equisetum arvense/helmateia</i>	horsetail/scouring rush	Equisetaceae	PFO-, PSS, RIP	roots, shoots, inner pulp	2,3,4,5
<i>Fragaria</i> spp.	strawberry	Rosaceae	UPL	fruit, leaves (tea)	3,6
<i>Heracleum lanatum</i>	cow parsnip	Umbelliferae	PFO-, RIP, UPL	stems-food, flutes	2,4,6
<i>Lysichitum americanum</i>	skunk cabbage	Araceae	PFO-, PSS, PEM-, RIP	roots, leaves (wrap)	3,4,6
<i>Montia perfoliata/sibirica</i>	miner's lettuce, candyflower	Portulacaceae	PFO-, RIP, UPL	greens	3
<i>Nuphar polysepalum</i>	yellow spatterdock	Nymphaeaceae	PAB-	tubers, seeds	3
<i>Oenanthe sarmentosa</i>	water parsley	Umbelliferae	PEM-	young stems	3,4
<i>Oxalis oregana</i>	wood sorrel	Oxalidaceae	UPL	greens	3
<i>Polygonum amphibium</i>	water smartweed	Polygonaceae	PEM-	seeds, roots	3
<i>Potystichum minus</i>	swordfern	Polypodiaceae	UPL, RIP	leaves (wrap), rhizomes (?)	2,6
<i>Potentilla anserina</i>	silverweed	Rosaceae	PEM-	roots, leaves	2,3,4,6
<i>Pteridium aquilinum</i>	bracken fern	Polypodiaceae	UPL	fronds, rhizomes	2,3,6
<i>Rorippa nasturtium-aquaticum</i>	water cress	Brassicaceae	PEM-	greens	3
<i>Sagittaria latifolia</i>	wapato	Alismataceae	PEM-	tubers	2,3,4,5,6
<i>Scirpus</i> sp.	bullrush	Cyperaceae	PEM-	mats/weaving, edible shoots	3,6
<i>Typha latifolia</i>	cattail	Typhaceae	PEM-	stuffing, rhizome, shoots	3,4,6
<i>Urtica dioica</i>	stinging nettle	Urticaceae	PFO-, RIP	shoots/leaves-five, dyes	2,3
<i>Verbena hastata</i>	blue vervain	Verbenaceae	PEM-, RIP	seeds	3
<i>Vicia</i> sp.	vetch sp.	Leguminosae	UPL	seeds/pods	3
Habitat Codes:					
UPL	upland habitats				
UPL/FOR	forested upland				
RIP	riparian (may be upland)				
PFO-	palustrine forested wetland				
PSS-	palustrine scrub/shrub wetland				
PEM-	palustrine emergent (herbaceous) wetland				
PAB-	palustrine aquatic bed wetland (ponds)				
Sources:					
					1. David Douglas (Davies 1980)
					2. Gunther 1973
					3. Kirk 1970
					4. Geiger 1988
					5. Lewis and Clark
					6. Turner 1978
					7. Turner 1979

CHAPTER 5: ETHNOGRAPHY AND ETHNOHISTORY

The Lower Columbia Valley--within which the Columbia South Shore is located--was occupied at the time of historic contact by Chinookan peoples, whose territory extended from the Pacific Coast more than 200 miles up the Columbia River to The Dalles. This chapter provides an overview of the written record relating to early use of the Columbia South Shore by Chinookan peoples. The most detailed written accounts of Indian use in the Area come from the journals of Lewis and Clark, which note the presence of two Chinookan villages. Other sources discuss Indian language, sociopolitical organization, groupings, subsistence resources, population and trade activities.

The first recorded contact between Chinookans and Euroamericans occurred in May 1792 when Robert Gray sailed into the Columbia River estuary. In October of that same year, Lieutenant William Broughton explored up the Lower Columbia to a point above present Vancouver, Washington. In the autumn of 1805, Lewis and Clark descended the Lower Columbia and wintered at Fort Clatsop near its mouth before journeying back upriver in the spring of 1806 on their return trip.

More than a century passed after the first recorded contact before the first formal ethnographic studies began among the Chinookans. Initial fieldwork by Franz Boas in the early 1890s involved the collection of Lower Chinook and Kathlamet myths (Boas 1894, 1901), and Edward Sapir conducted linguistic research among the Wishram Chinook at The Dalles in 1905. Ethnographic studies intended to document pre-contact lifeways were not undertaken among Chinookan peoples until the 1920s and 1930s, and these involved only two Chinookan groups: the Wishram Chinook at The Dalles (Spier and Sapir 1930) and the Lower Chinook around the mouth of the Columbia River (Ray 1938). An extensive body of Clackamas myths was collected in 1929 and 1930 by Melville Jacobs (1958, 1959a, 1959b, 1960).

Much of what is known about the Chinookan peoples is from the accounts of early explorers, fur traders, missionaries, and military personnel who traveled along the Columbia River in the early historic period (Ruby and Brown 1976). In evaluating the ethnographic and ethnohistoric literature it must be remembered that these accounts relate to societies that were in the process of collapse as a result of extreme population losses from disease, dislocation from traditional territories by Euroamerican settlers, and acculturation to Euroamerican culture. As a result, ethnographic and ethnohistoric accounts may not accurately reflect the traditional lifeways practiced in the Lower Columbia Valley.

Although little specific information is available about the particular Chinookan groups who lived in the Columbia South Shore vicinity, the general pre-contact lifeways can be reconstructed to some degree from information contained in ethnohistoric sources and in ethnographic studies of other Chinookan groups. The Lewis and Clark journals are particularly important in this regard, as they contain some of the earliest accounts of Indian peoples in the Lower Columbia Valley. Although necessarily lacking in detail, this reconstruction provides a cultural context for interpreting archaeological evidence associated with Indian use of the Columbia South Shore environment within the last several centuries.

LANGUAGE

The Chinookan language, which is classified as an independent branch of the Penutian phylum, is commonly considered to consist of two languages: Lower Chinook and Upper Chinook (Boas 1894:5-6; 1901:6). The two groups at the mouth of the Columbia River spoke two dialects that were very similar and which together comprise the Lower Chinook language. These dialects were distinct from the related, but mutually unintelligible, languages of the remaining Chinookan peoples upstream.

The Upper Chinook language, in turn, has been classified into the following dialect clusters: Kathlamet, spoken from Tongue Point upstream to Kalama; Multnomah, spoken from the mouth of Lewis River upstream to Government Island (including Sauvie Island and the mouth of the Willamette River); and Kiksht, spoken by the Clackamas at Willamette Falls and along the Clackamas River, as well as by Chinookans farther upstream around the Cascades and at The Dalles (Silverstein 1990:533-535; Thompson and Kinkade 1990:41).

It has recently been suggested that Kathlamet has sufficiently different pronunciation, grammar, and lexical items for it to be considered a third language, standing between Lower and Upper Chinook, and the name Middle Chinook has been proposed (Hymes 1981:16). The name Middle Chinook was previously used long ago by Gatschet (1877), as well as more recently by Wuerch (1979), to refer to the Chinookan groups occupying the central portion of the Lower Columbia Valley.

SOCIOPOLITICAL ORGANIZATION

The principal social and political unit among the Chinookan peoples was the village, or in some cases a small cluster of villages. In certain cases, a local village name came to be applied to a larger cultural entity, as when the name of

the Chinook village at the mouth of the Columbia River came to refer to all Indian groups who spoke dialects of the Lower or Upper Chinookan language. Specific "tribes" or "nations" referred to in historic records were often artificial groupings of indigenous peoples, often named by Euroamericans during the treaty-making process (Hajda 1984:7-15). These tribes or nations may not accurately reflect traditional social groupings.

Each Chinookan village was led by its own chief, who held judicial and advisory power, and who had the power to appropriate the property of others for personal purposes (Ray 1938:55-56; Silverstein 1990:541). The village was composed of a variable number of households. The most frequent estimate of household size was three or four families. These household units apparently consisted of extended families that were usually related patrilineally (Hajda 1984:169). As families grew, members might occasionally split off, forming small groups of related villages or village clusters (Hajda 1984:165-168; Silverstein 1990:536).

Like other Northwest Coast peoples, Chinookan society was ranked. The chief, along with shamans, warriors, and traders, formed the small upper class. The bulk of the population was composed of commoners or lower class, and at the bottom of the status hierarchy were slaves (Ray 1938:48-49; Hajda 1984:183-203; Silverstein 1990:541-543). Class, status, and rank were based for the most part on wealth, as great chiefs were usually described as men of great wealth (cf. Spier and Sapir 1930:211). However, as the office of chief tended to be limited to certain families, it was basically only commoners who could elevate themselves through wealth accumulation and personal achievements (Silverstein 1990:541).

A man and his wife or wives, together with their children and slaves, lived together in the same house (Hajda 1984:170). Ideally, marriages occurred between members of different villages (village exogamy) (Hajda 1984:178-183). While residence was usually patrilocal (with a married couple residing in the same house or village as the husband's family), kinship ties were traced bilaterally (Hajda 1984:176-178). Polygyny (the practice of having more than one wife) apparently increased after historic contact (Hajda 1984:170), and as a result kin ties were widely ramified (Hajda 1984:176-177). Wives generally came from areas where head-flattening was practiced, while slaves were obtained from areas where it was not (Hajda 1984:178).

CHINOOKAN GROUPS IN THE SOUTH SHORE AREA

Lewis and Clark recognized two divisions among the Chinookan villages along the Lower Columbia River in the vicinity of the Columbia South Shore: (1) the "Wappato Indians," sometimes referred to by others as "Multnomahs," and (2)

the "Shahala Nation" (for a listing of village names, see Saleeby 1983; Saleeby and Pettigrew 1983; Hajda 1984). These two divisions correspond closely with dialects of the Upper Chinookan language.

In their "Estimate of Western Indians," Lewis and Clark refer to the "Wappato Indians" as encompassing 13 "tribes" concentrated in the vicinity of Sauvie Island. The "tribe" farthest upriver was the Ne-cha-co-kee "on the S. Side of the Columbia a few miles below quick Sand river [Sandy River]" (Moulton 1990:484). The "tribe" farthest downriver was the Cal-la-maks, who "reside on a creek which falls into the Columbia on the N. Side at the lower part of the Columbia Valley N. Side" (Moulton 1990:484). The Cal-la-maks have been identified as the group that lived at the mouth of the Kalama River (Hajda 1984:111-112).

One of the "tribes" on Sauvie Island subsumed under the name "Wappato Indians" was the Mult-no-mah who "reside on Wap-pa-tow Island in the Mouth of the Multnomah [Willamette River], the remains of a large nation" (Moulton 1990:484; also see Moulton 1991:32-34). Four other "tribes"--Clannahqueh, Cathlahcommahup, and Cathlahnahquiah on Sauvie Island and Nemaquinneer on the Oregon mainland--were listed as "tribes of Multnomah" (Moulton 1990:484). The term Multnomah is derived from *malnumax* meaning "those towards the water" ("those closer to the Columbia River") (Silverstein 1990:545). As Alexander Ross, one of the fur traders at Fort Astoria, also later subsumed most of people on Sauvie Island under the name "Moltnomas" (Ross 1849:87), this term apparently gradually came to refer to most, if not all, of the Indians in the "Wappato Valley" (Hajda 1984:66).

As indicated in Lewis and Clark's "Estimate of Western Indians," the "Shahala Nation reside at the Grand rapids and extend down in different Villages as low as the Multnomah river" (Moulton 1990:483). The village farthest downstream assigned to the Shahala was "Ne-er-cho-ki-oo 1 House 100 sole on the S. side a few miles above the Multnomah R." (Moulton 1990:483). Lewis and Clark were apparently the only early Euroamericans to use the term "Shahala" (Hajda 1984:67). This term was derived from *saxlatks* meaning "those upriver" and was a term used to refer to Chinookan peoples upstream at the Cascades (Hajda 1984:67; Silverstein 1990:535).

CHINOOKAN VILLAGES IN THE SOUTH SHORE VICINITY

As discussed above, Lewis and Clark indicated that two different Chinookan groups occupied territory within the Columbia South Shore vicinity. Each of these groups was associated with a single village in this area: the Wappato or

Multnomah with the village of Nechacolee, and the Shahala with the village of Neerchokioo. The locations of these villages are shown on Lewis and Clark's map of this section of the Portland Basin reproduced in Figure 4.

Neerchokioo Village

The Neerchokioo village was first mentioned in Clark's journal entry of November 4, 1805:

on the Main Lard Shore a Short distance below the last Island we landed at a village of 25 *Houses*: 24 of those houses we[re] thached with Straw, and covered with bark, the other House is built of boards in the form of those above, except that it is above ground and about 50 feet in length and covered with broad Split boards This village contains about 200 men of the *Skil-loot* nation I counted 52 canoes on the bank in front of this village maney of them verry large and raised in bow. we recognised the man who over took us last night, he invited us to a lodge in which he had Some part and gave us a roundish roots about the Size of a Small Irish potato which they roasted in the embers until they became Soft, This root they call *Wap-pa-to* which the *Bulb* of the *Chinese* cultivate in great quantities called the *Sa-git ti folia* or common arrow head. it has an agreeable taste and answers verry well in place of bread. we purchased about 4 bushels of this root and divided it to our party (Moulton 1990:17).

The "Skilloot nation" that appears in the passage quoted above is probably a reference to the Echelute or Wishram Chinookans at The Dalles (Hajda 1984:65-66). The initial identification of Neerchokioo as a Skil-loot village was later changed to reflect affiliation of this village with the Shahala at the Cascades (Moulton 1990:20n, 483). This village is designated "Sha-hala N." on Atlas map 79 (Moulton 1983; Figure 6).

On their return upriver the following spring, Lewis and Clark camped on the night of April 1, 1806 on the north side of the Columbia opposite the mouth of Sandy River. The next day William Clark conducted a reconnaissance back downstream to examine the mouth of the Willamette River. On his way to the Willamette he revisited the Neerchokio village on April 2, 1806, at which time he described the village and its inhabitants in some detail:

at 3 P.M. I landed at a large double house of the *Ne-er-cho-ki-oo* tribe of the *Shah-ha-la* Nation. at this place we had Seen 24 additional Straw Huts as we passed down last fall and whome as I have before mentioned reside at the Great rapids of the Columbia. on the bank at different places I observed Small Canoes which the women make use of to gather Wappato

& roots in the Slashes. those Canoes are from 10 to 14 feet long and from 18 to 23 inches wide in the widest part tapering from the center to both ends in this form and about 9 inches deep and So light that a woman may with one hand haul them with ease, and they are Sufficient to Carry a woman an Some loading. I think 100 of those canoes were piled up and Scattered in different directions about in the Woods in the vecinity of this house, the pilot informed that those Canoes were the property of the inhabitants of the Grand rapids who used them occasionally to gather roots. I entered one of the rooms of this house and offered Several articles to the nativs in exchange for Wappato. they were Sulkey and they positively refused to Sell any (Moulton 1991:57).

On his way back after examining the mouth of the Willamette River, Clark stopped again at the Neerchokio village:

...we arived at the Ne er cho ki oo house in which the nativs were So illy disposed yesterday at 11 A.M. I entered the house with a view to Smoke with those people who Consisted of about 8 families, finding my presence alarmed them So much that the children hid themselves, womin got behind their men, and the men hung their heads, I detained but a fiew minits and returned on board the canoe (Moulton 1991:64).

Nechacolee Village

As noted above, the farthest upriver village of the "Wapato Indians" or "Multnomah Tribes" was Nechacokee (Moulton 1990:484). This village appears as "Nech-e-co kee N." on Atlas map 79 (Moulton 1983; Figure 4). The spelling "Nechacolee" is derived from the Chinookan *ni-caqwle* meaning "stand of pines" and is followed here (Hajda 1984:323; Silverstein 1990:534; Moulton 1991:61n). This village is first mentioned in Clark's journal entry of April 2, 1806 as follows:

at 8 miles passed a village on the South side at this place my Pilot informed me he resided and that the name of his tribe is *Ne-cha-co-lee*, this village is back or to the South of Dimond [Government] island, and as we passed on the North Side of the island both decending & assending did not See or know of this Village. I proceeded on without landing at this village (Moulton 1991:57).

A few days later, on April 3, 1806, Clark visited this village and described it in some detail:

at 3 PM. we arived at the residence of our Pilot which consists of one long house with Seven appartments or rooms in Square form about 30 feet each room opening into a passage which is quit through the house those

passages are about 4 feet in width and formed of wide boards set on end in the ground and reaching to the roof which serves also as divisions to the rooms...the apartments about 30 feet square. this house is built of bark of the white cedar supported on long stiff poles resting on the ends of broad boards which form the rooms &c. back of this house I observe the wreck of 5 houses remaining of a very large village, the houses of which had been built in the form of those we first saw at the long narrows of the *E-lute* Nation with whom those people are connected (Moulton 1991:64-65, 84-85).

The *E-lute* Nation mentioned here by Clark refers to the Echelut Indians near The Dalles, who were Wishram Chinookans (Moulton 1991:70n). Echelut houses conformed to the standard Chinookan house style which consisted of a gable roofed structure with split cedar plank walls supported on a framework of heavy cedar timbers (Silverstein 1990:537-538). Clark then inquired about the whereabouts of the people who formerly inhabited the five other houses and received the following reply:

I endeavored to obtain from <them> those people of the situation of their nation, if scattered or what had become of the natives who must have peopled this great town. an old man who appeared of some note among them and father to my guide brought forward a woman who was badly marked with the smallpox and made signs that they all died with the disorder which marked her face, and which she was very near dying with when a girl. from the age of this woman this destructive disorder I judge must have been about 28 or 30 years past, and about the time the Clatsops inform us that this disorder raged in their towns and destroyed their nation (Moulton 1991:65, 86).

This woman was probably a survivor of the earlier of two smallpox epidemics that are known to have occurred in the Lower Columbia Valley before the arrival of Lewis and Clark (Hajda 1984:71; Boyd 1985:80-81, 99, 102-103).

Clark went on to remark that "Those people speak a different language from those below tho' in their dress habits and manners they differ but little from the Quathlahpohtles...those people have some words the same with those below but the air of their language is entirely different" (Moulton 1991:65). Lewis repeats much of the information presented by Clark in his journal entry of April 6, 1806. In regard to the language issue, Lewis wrote that "their language is the same with the Elutes [Echelutes or Wishram Chinookans upstream at The Dalles]" (Moulton 1991:85). These passages would seem to call into question Lewis and Clark's later assignment of the Nechacolee to "Wappato Indians" in their estimate of Western Indians.

In summary, Lewis and Clark refer to two Chinookan villages in the Columbia South Shore vicinity: (1) Neerchokio, described as a few miles above the Multnomah River (Moulton 1990:483-484); and (2) Nechacolee, described as a few miles below Sandy River opposite present-day Government Island (Moulton 1991:57). Interestingly, the village farther downriver, Neerchokio, was said to be occupied by people affiliated with the Shahala group of Chinookans who resided primarily upriver in the Cascades area. Conversely, the village farther upriver, Nechacolee, was said to be affiliated with the "Wappato Indians" downstream around Sauvie Island. As noted above, however, Lewis and Clark's journal entries seem to contradict the grouping of villages presented in their Estimate of Western Indians. This situation suggests that, like the Neerchokioo village downstream, the Nechacolee village may have been affiliated with upriver peoples as well.

FIGURE 6: LEWIS & CLARK MAP

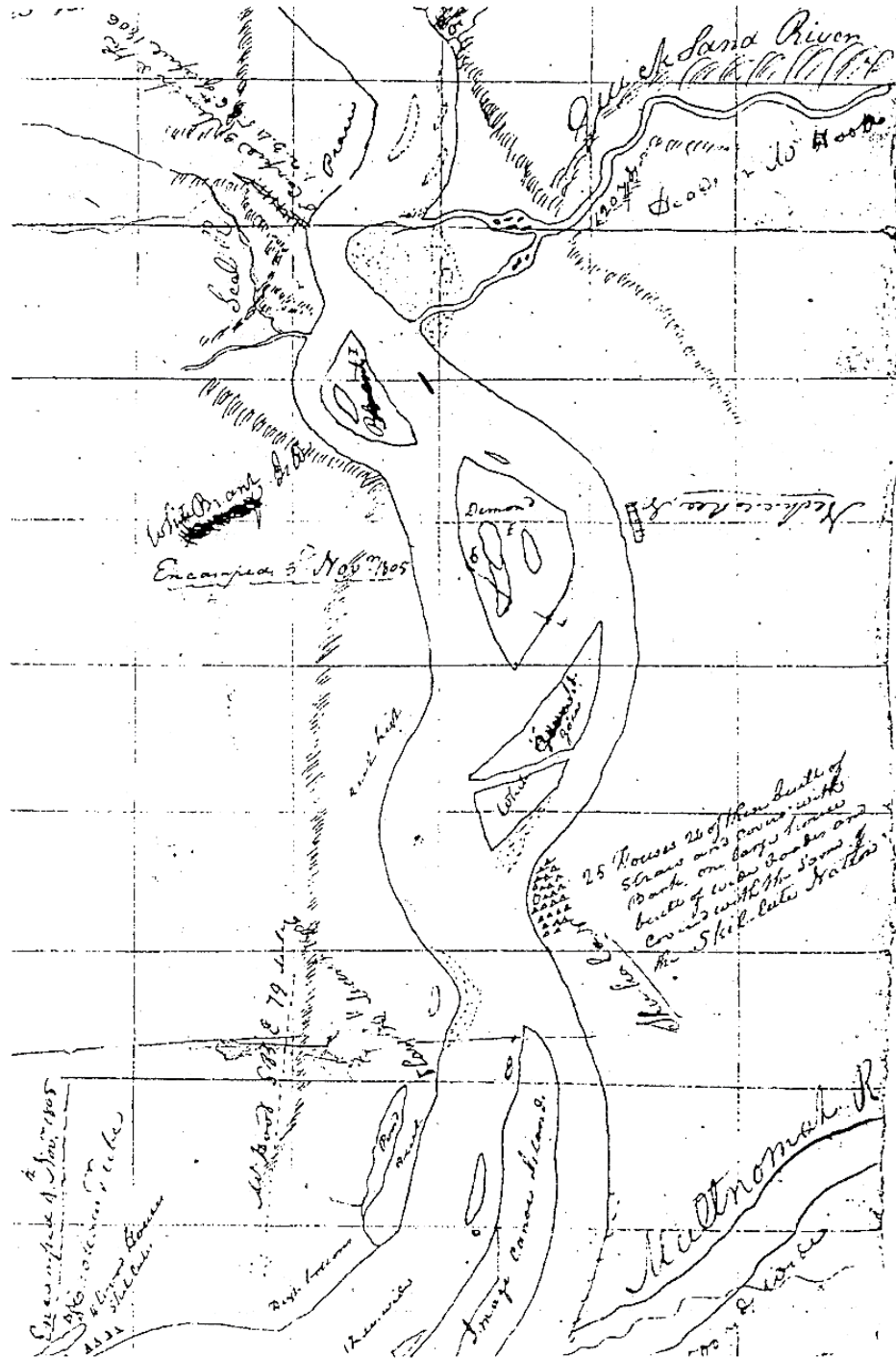


Figure 6: Lewis and Clark's map of the eastern portion of the Portland Basin showing the location of the Neerchokioo and Nechacolee villages in the Columbia South Shore vicinity (from Moulton 1983: Map 79).

SUBSISTENCE RESOURCES

The resource base of foods potentially exploitable by Indian groups in the Lower Columbia Valley has recently been assessed by Boyd and Hajda (1987). In their study, the frequency with which foods were mentioned in the ethnohistoric literature was used to identify "staples" or Class One resources (cited as food 30 or more times) and "secondary" or Class Two resources (cited 6 to 15 times). Foods cited fewer than six times were assumed to rank low as preferred foods and were not considered further. Boyd and Hajda's resource base compilation is reproduced in Table 3.

Unlike the Lower Chinookans at the mouth of the Columbia River who were maritime hunter-gatherers with a heavy reliance on marine resources, including shellfish, fish, mammals, and birds available in the offshore and estuarine environments, the Upper Chinookans were adapted to resources upstream in the riverine environment of the Lower Columbia Valley (Saleeby 1983). Accordingly, marine clams, whales, and perhaps certain botanical species (e.g., *Lupinus littoralis*) were not directly accessible to these upriver peoples. Once these marine-estuarine resources are excluded, the results of Boyd and Hajda's analysis suggest that the staple (Class One) foods of the native peoples inhabiting the Lower Columbia Valley above the estuary consisted of 1) fish, especially salmon, sturgeon, and eulachon; 2) animals, especially elk, deer, and possibly harbor seal; and 3) bulbs, roots, and greens, especially wapato and camas.

In terms of specific resources available in the Columbia South Shore vicinity, Lewis and Clark's description of the Neerchokioo village notes that 100 canoes of the type used by women to gather wapato and roots "in the Slashes" [lakes and sloughs] were scattered nearby (Moulton 1991:57). In another journal entry, made on April 5, 1806 while encamped on the north side of the Columbia across from the mouth of Sandy River, Clark noted that "The Country on either Side is fertile, the bottom on the South Side is wide and intersperced with Small ponds in which the natives gather their Wappato" (Moulton 1991:77). Other botanical resources potentially available in the Columbia South Shore vicinity are discussed in Chapter 4.

As noted by Boyd and Hajda (1987:314), their compilation of subsistence resources does not include some foods that are well represented in assemblages of faunal remains from prehistoric archaeological sites. Among these animals are freshwater fish and shellfish, waterfowl, bear, and a variety of small mammals such as dog, bobcat, beaver, raccoon, sea and river otters, porcupine, muskrat, mink, marten, rabbit, and tortoise (Saleeby 1983:126-145). In addition, botanical species not included on Boyd and Hajda's list that have been recovered from archaeological contexts include acorns and hazelnuts (Saleeby 1983:146-147).

This situation suggests, then, that while ethnohistoric sources may provide an indication of the "preferred foods" (Boyd and Hajda 1987:314), under conditions of favorable preservation archaeological contexts will provide a more complete record of the foods that were actually eaten.

VARIATION IN RESOURCE AVAILABILITY

The abundance and availability of subsistence resources exploited by the Indian peoples of the Lower Columbia Valley varied geographically and seasonally (Saleeby 1983; Hajda 1984; Boyd and Hajda 1987). This variation is reflected in the data on habitat and harvest months provided in Table 3. In terms of intra-regional variation, it has previously been noted that most species of marine mammals, birds, and shellfish important in the subsistence practices of coastal peoples were not available to the inhabitants of the Lower Columbia Valley upstream from the estuary.

Table 3. Foods of the Lower Columbia Indians mentioned in ethnohistoric sources (from Boyd and Hajda 1987).

Common Name	Scientific Name	Habitat	Harvest Months
A. AQUATIC FOODS			
Staples			
1. Salmon	<i>Onchorynchus</i>		
Chinook	<i>O. tshawytscha</i>	main trunk of Columbia & lower middle tributaries	Mar.-Aug. Mar.-Apr.
Coho	<i>O. kisutch</i>	lower middle tributaries & lower tributaries	June-July Aug.-Oct.
2. White sturgeon	<i>Acipenser transmontanus</i>	main trunk of Columbia, deep water	Jan.-Mar. Aug.-Sept.
3. Eulachon	<i>Thaleichthys pacificus</i>	spawns in lower Cowlitz, Lewis, Sandy, Gray's & Kalama rivers	Feb.-Mar.
Secondary Resources			
4. Trout	<i>Salmo gairdneri</i>	streams	
5. Steelhead	(anadromous trout)	major waterways	July-Sept.
6. Lamprey Eel	<i>Lampetra tridentata</i>	taken at falls	(summer)
7. Clams		seashore, bays	
8. Salmon	<i>Onchorynchus</i>		
Sockeye	<i>O. nerka</i>	main trunk of Columbia	June-July

Chum	<i>O. keta</i>	main trunk, a few minor tributaries	October
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Table 3 (continued)

Common Name	Scientific Name	Habitat	Harvest Months
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B. ANIMAL FOODS

Staples

1. Elk	<i>Cervus canadensis</i>	cosmopolitan, open forests	(winter)
2. Deer	<i>Odocoileus</i>		
Blacktail	<i>O. hemionus</i>	cosmopolitan, forests	(fall)
Whitetail	<i>O. virginianus</i>	river bottoms, prairies	(fall)

Secondary Resources

3. Harbor seal	<i>Phoca vitulina</i>	Columbia and Willamette (below falls)	(spring-summer)
4. Grey whale	<i>Eschrichtius glaucus</i>	coast	April

C. BULBS, ROOTS, AND GREENS

Staples

1. Wapato	<i>Sagittaria latifolia</i>	middle river swamps	year-round; best in Fall
2. Camas	<i>Camassia quamash</i>	middle river damp prairies	May-July
3. Thistle	<i>Cirsium edule</i>	coast, moist ground	
4. Lupine	<i>Lupinus littoralis</i>	coast (esp.), beaches	
5. Bracken	<i>Pteridium aquilinum</i>	coast (esp.), burns	
6. Horsetail	<i>Equisetum telmateia</i>	coast (esp.), moist ground	
7. Shappelel	<i>Lomatium</i> spp.	dry rocky soil above cascades	Apr.-Aug.

D. BERRIES

Secondary Resources

1. Huckleberry	<i>Vaccinium</i>		
Evergreen	<i>V. ovatum</i>	coast clearings	Aug.-Oct.
Mountain	<i>V. macrophyllum</i>	mountain clearings	Aug.-Oct.
Oval-Leaf	<i>V. ovalifolium</i>	mid-latitude woods	Aug.-Oct.
2. Blackberry	<i>Rubus macropetolus</i>	middle river clearings	August
3. Bearberry	<i>Arctostaphylos uva-ursi</i>	dry banks	(fall)
4. Salal	<i>Gaultheria shallon</i>	woods	August

Note: See Boyd and Hajda (1987) for supporting documentation.

Fruits also may have been relatively more important among coastal peoples, as suggested by Swan (1857:88), who observed that among the Lower Chinook on

Willapa Bay "as the season advances and the fruits ripen, great quantities are used as food, to the exclusion of fish and meats."

On the other hand, the riverine environment upstream from the estuary provided important resources not readily available to coastal peoples. The largest runs of eulachon, for example, occur in the Cowlitz and other rivers upstream from the estuary (Gray's River at the upstream end of the estuary is the farthest river downstream with a significant eulachon run). Of greater significance, however, was the higher density of key plant foods in the riverine environment upstream from the estuary. The most important of these resources, wapato, was apparently not found along the coast (Moulton 1990:154), "except [perhaps] in very small quantities" (Swan 1857:90), and apparently did not grow above the rapids at the Cascades (Cox 1831:76). Camas, while present in the coastal zone, was almost certainly more widespread in the wet prairies of the interior. Although acorns were described as "fairly extensively used" by the Lower Chinook (Ray 1938:123), they were almost certainly more available upstream in oak woodlands associated with the riverine environment. Hazelnuts, known to have been eaten by the Wishram Chinook at The Dalles (Spier and Sapir 1930:184), are not mentioned among the plants utilized by the Lower Chinook, suggesting that hazelnuts were primarily an upriver resource.

Besides intra-regional variation, there was also a seasonal aspect to the abundance and availability of subsistence resources (Saleeby 1983:148-152; Boyd and Hajda 1987:314-316). As indicated in Table 3, eulachon, white sturgeon, and spring Chinook salmon were the most important subsistence resources available in the spring. The broadest range of resources was available during the summer months; these included summer Chinook and Coho salmon, steelhead, lamprey eels, and most of the bulbs, roots, and greens. Autumn resources included Chum salmon, deer, and berries. Although Lewis noted that wapato "is abundant and appears to never be out of season at any time of the year" (Moulton 1991:38), it was probably harvested mostly in fall (Boyd and Hajda 1987:316). Although potentially available throughout the year, elk may have been most important during the winter when fewer other resources were available.

Seasonal variation in the availability of subsistence resources was offset by the development of preservation and storage technology (Saleeby 1983:27-28). Salmon were preserved by drying, pounding, and storage in baskets as well as by smoke-drying (Spier and Sapir 1930:178-179). Berries were preserved by mixing them with salmon or seal oil, drying them in the sun, and storing them in boxes or baskets. Roots were pounded into cakes that when dried were easily preserved (Spier and Sapir 1930:182-185). Despite the fact that the Lower Columbia Valley provided an especially favorable setting for settlement, references to occasional starvation are found in the ethnographic and ethnohistoric literature (e.g., Boas 1894:230; Coues 1897:912).

SETTLEMENT PATTERNS

Like the Lower Chinookans at the mouth of the Columbia River, most if not all of the upriver peoples shifted the location of their settlements biseasonally.

Chinookan winter villages involved patrilocal residence in theory, but summer residences might be found anywhere that people related through women lived (Hajda 1984:172). Seasonal movements were regulated primarily by the timing of salmon runs, but the availability of other resources, such as smelt, sturgeon, or wapato may have also affected these moves (Hajda 1984:91-95; Boyd and Hajda 1987:318-320).

It has been argued by Saleeby, however, that the dense concentration of subsistence resources may have made seasonal movements in the Portland Basin unnecessary (Saleeby 1983; Saleeby and Pettigrew 1983). As these concentrations occurred in proximity to villages, in some cases villages may have been occupied year-round. Under these circumstance, villages would have been abandoned temporarily only when high water levels during the seasonal freshets reached floodstage (Saleeby 1983:224-228).

Boyd and Hajda (Hajda 1984:91-93; Boyd and Hajda 1987:318-320) have countered this argument by noting the numerous references to seasonal movements contained in ethnohistoric accounts. They also cite differences in the two sets of population estimates provided by Lewis and Clark as evidence of seasonal population movements in the Portland Basin.

As Saleeby's argument for greater residential stability in the Portland Basin is based in large measure on evidence from late prehistoric archaeological sites, it is possible that some villages in this area may have been occupied on a year-round basis before historic contact. The seasonal movements documented in the historical record may represent a recent settlement pattern that emerged as an outgrowth of extreme population decline in the early historic period.

POPULATION

Lewis and Clark's population estimates have been used by Boyd and Hajda (Hajda 1984:67-75; Boyd 1985:272-286; Boyd and Hajda 1987) to reconstruct the size of the Indian population in the Lower Columbia Valley. Lewis and Clark submitted two sets of figures, an earlier set that was lower compiled during the winter at Fort Clatsop, and a later set that was higher compiled following the return trip in April. As noted by Hajda (1984:71), "while Clark might have revised the figures upwards anyway after greater familiarity with the people, the later figures quite possibly reflect seasonal shifts in population." Boyd and Hajda

(1987:321) explore this line of reasoning further, and conclude that the lower estimate of 9800 represents the permanent winter population of the Lower Columbia, while the larger figure of 17,840 includes spring visitors to the river as well as the resident population. Lewis and Clark's population estimates for the various native groups are presented in Table 4.

The Wappato Valley, which includes divisions 4-8 in Table 4, has a combined total of 2210 in the manuscript estimate and 5390 in the printed estimate (Boyd and Hajda 1987:313n). Considered together, the "Wappato Indians" formed the densest population cluster in the Lower Columbia Valley. This high population density was apparently made possible by the concentration of vegetal resources in the marsh areas in and around Sauvie Island (Hajda 1984:89). The existence of this unusually dense population could be inferred as support for the idea that settlement in this portion of the Lower Columbia Valley involved year-round villages, as suggested by Saleeby (1983).

Although Lewis and Clark's estimates are the earliest available, it should be noted that these explorers arrived in the region after smallpox epidemics in the 1770s and 1801 had already ravaged the population (Hajda 1984:71; Boyd 1985:80-81, 99, 102-103). The first epidemic, which was probably especially devastating as it presumably took hold upon populations previously unaffected by this disease, resulted in the estimated loss of 33% of the Indian population of the Pacific Northwest (Boyd 1985:95). Smallpox was then reintroduced in 1800-1801, as indicated by a comment by Lewis and Clark in their journal entries for February 7, 1806 (Moulton 1990:285-286). As a result, Lewis and Clark's population estimates are almost certainly low (Boyd 1985:286).

Table 4. Lower Columbia Village Populations as Seen by Lewis and Clark
(Source: Boyd and Hajda 1987:313).

Villages and village clusters		Manuscript Estimate	Printed Estimate
1.	Columbia mouth	700	700
	Killaxthokle	100	100
	Chinook	400	400
	Clatsop	200	200
2.	"Marshy Islands"	300	500
	Cathlahmah	200	300
	Wackkiacum	100	200

Table 4. (cont') Lower Columbia Village Populations as Seen by Lewis and Clark

Villages and village clusters	Manuscript Estimate	Printed Estimate
3. "Marshy Islands" to Cowlitz (Skillute)	1500	2500
4. Kalama (Callamak)	200	200
5. Lower Sauvie Island/Lewis River	1080	2830
Quathlahpohtle	300	900
Clackstar	350	1200
Cathlahcumup	150	450
Clannarminnamon	280	280
6. Lake River/Vancouver Lake (Shoto)	180	460
7. Sauvie Island, Columbia side	330	930
Clannaqueh	130	130
Multnomah	200	800
8. Multnomah Channel	420	970
Clanninata	100	200
Cathlahnahquiah	150	400
Cathlahcommahkup	70	170
Nemalquinner	100	200
9. Willamette Falls/Clackamas	1250	2650
Clarkamus	800	1800
Charcowah	200	200
Cushhook	250	650
10. Wappato Valley, east end	140	200
Neerchokioo	40	100
Nehacokee	100	100
11. The Cascades (Shahala)	1300	2700
12. The Cascades to The Dalles	1800	2200
Smackshop	800	800
Chilluckkittequaw	1000	1400
13. The Dalles (Echelute)	600	1000
TOTALS	9800	17,840

The introduction of infectious diseases during the early historic period led to rapid decline in the Indian population. As their territory coincided with the main route of travel and communication along the Columbia River, the Chinookans were especially devastated by these diseases (Boyd 1985:267-323). Aside from the early smallpox epidemics, the "fever and ague" of the 1830s, most likely malaria, was a major factor in the decline in the population (Boyd 1985:112-144). Overall, infectious diseases occurring as epidemics between the 1770s and 1850s resulted in the death of 90% or more of the Indian population in the Lower Columbia Valley (Boyd 1985:520). The decline in the numbers of Chinookans led to the depopulation of certain areas of their territory, which were quickly claimed by other peoples, including bands of the Chehalis and Sahaptin-speakers (including Klickitat) from the Plateau (Boyd 1985:286, 313-319).

TRADE

The Chinookan peoples of the Lower Columbia Valley were well-known for their abilities as traders. The most detailed study of this important activity has been undertaken by Hajda (1984:205-262). Euroamerican observers used the term "trade" to encompass several kinds of exchange (Hajda 1984:228). Among the Chinookans and neighboring peoples, a wide array of goods was exchanged in various ways, including through "intervillage conflicts, 'trade' of valuables and of locally specialized items, especially food; gambling; marriage; visiting; hospitality; shamans' activities; and funerals" (Hajda 1984:206).

Trading activity apparently took place more or less throughout the year. Lewis and Clark, for example, observed Indians in canoes loaded with goods on trading expeditions during the winter of 1805-1806 (Moulton 1990:27, 144). More well known, however, are the trading centers that emerged where fish were taken in quantity during the summer months, most notably at The Dalles, at the Cascades, and at Willamette Falls (Hajda 1984:229).

The most often mentioned item of trade was wappato, which was traded by people in the "Wappato Valley," especially the Sauvie Island area, to neighboring peoples farther upstream on the Columbia as well as peoples downstream on the coast, including the Tillamooks (Hajda 1984:233). From coastal peoples the "Wappato Indians" received blubber and oil in return. From upriver peoples, the "Wappato Indians" received dried pounded salmon, shapallel (bread or biscuit made from cous), beargrass (probably for basket-making), acorns, and dried berries. Other items of trade included smelt and sturgeon obtained by the Clatsops from the Skillute; camas obtained by the Yamhill Kalapuya in exchange for dried salmon at Willamette Falls; and meat and roots obtained by the Clatskanie from the Skillute in exchange for salmon (Hajda 1984:332-333).

As a result of her analysis, Hajda (1984:250) identified two spheres of exchange among the Columbia River inhabitants. The first sphere involved food and raw materials, such as wapato, fish, acorns, berries, shapallel, whale blubber and oil, and beargrass. Acquisition of these resources involved little risk, was primarily undertaken during the warmer months by women, and exchanges were made primarily among related groups most frequently during the winter. The second sphere involved dentalia, slaves, furs and skins, horses, and possibly canoes. These resources were relatively scarce, were acquired at some distance, often with some risk, by men, and were exchanged in summer as well as winter, among strangers as well as relatives, sometimes across regional boundaries.

Economic exchanges in the second sphere were facilitated by the use of dentalium shells as a form of currency. After their introduction by Euroamericans, glass beads were used in a similar way. Blue beads were generally preferred. In conjunction with the fur trade, beaver skins and blankets also became a standard form of currency (Hajda 1984:230-232; Silverstein 1990:537).

CULTURAL POSITION OF THE CHINOOKAN PEOPLES

The cultural position of the indigenous cultures of the Lower Columbia Valley has never been well understood. Ethnographically, most of the groups inhabiting the Lower Columbia have been included within the Northwest Coast culture area (e.g., Drucker 1955). On the other hand, the Chinookan groups farthest upriver, the Wishram and Wasco, are generally considered part of the Plateau culture area (Ray 1939).

Some perspective on the larger culture area affiliations of the Chinookan peoples is provided by the distribution of the Chinookan languages and dialects. Linguistic reconstructions suggest that, as part of the movement of Penutian-speaking peoples into western Oregon and western Washington, the Chinookans moved down the Columbia to the ocean at a very early time. The Chinookan "homeland" (Hymes 1981:19), the point of greatest internal linguistic divergence, was in the Columbia River estuary. The chain of dialects extending upstream from the estuary indicates that the Chinookans later spread back up the Columbia, eventually as far upstream as The Dalles (Rigsby 1965:245-250; Silverstein 1974:598-99; Hymes 1981:17-19; Thompson and Kinkade 1990:45-47). In its latest movement, "the Upper Chinookan speech community expanded its boundaries eastward up the Columbia River to the Dalles region in recent centuries" (Rigsby 1965:250).

The Chinookans have recently been viewed as the central society within the "Greater Lower Columbia," a concept that emphasizes the regional connections of local groups through intermarriage, exchange, conflicts, slave raids, visits, and resource utilization (Hajda 1984:275-286). This social region, it is believed, cut across linguistic, cultural, and ecological zones because the members were multicultural and multilingual (Hajda 1984:278). The characteristic Chinookan practice of flattening the heads of all free-born peoples is believed to have symbolized identity within this social system (Hajda 1984:276-277). The "Greater Lower Columbia" concept is innovative and useful because it stresses communication and exchange between groups on a regional level, a perspective that is not usually provided in traditional ethnographic studies of single societies.

As it pertains to a period of extreme upheaval, the extent to which the "Greater Lower Columbia" existed before historic contact remains uncertain. The language and dialect boundaries among the Chinookans, not to mention the other linguistic groups included in the hypothesized social region, could only have arisen as a result of some degree of separation over time. The multilingualism evident in the early historic period, accomplished to a large extent by the emergence of Chinook jargon as a *lingua franca*, can easily be seen as a development resulting from the 90% decline in population and consequent amalgamation among the survivors of different groups. In this respect, the emergence of the "Greater Lower Columbia" represents a classic example of the adjustments made by native peoples in response to the catastrophic population decline that ensued as a result of the destructive effects of contact with Euroamericans (cf. Dobyns 1983).

SUMMARY

The journals of Lewis and Clark provide the only first-hand accounts of native peoples in the Columbia South Shore vicinity. These accounts indicate that two Chinookan villages were located in this area at the time of historic contact. The village of Neerchokioo was said to be affiliated with the Shahala Chinookans upstream at the Cascades. The affiliation of the village of Nechacolee is uncertain. In their Estimate of Western Indians, Lewis and Clark grouped this village with the Wappato Indians downstream, but in their journal entries they noted linguistic differences that would seem to indicate affiliation with upriver groups instead.

As indicated in Lewis and Clark's population estimates for the Lower Columbia Valley (Table 4), the Nechacolee village is estimated to have had a population of 100. The population of Neerchokioo village is given as 40 people in the

Manuscript Estimate and 100 people in the Printed Estimate. This disparity clearly reflects seasonal differences in residency. Summer residents were still at Neerchokioo when Lewis and Clark visited on November 4, but when Clark revisited this settlement on April 2 only the one permanent wooden house was occupied.

In addition to the information on villages, Lewis and Clark's accounts provide some idea of the nature of the activities that Indian peoples carried out in the Columbia South Shore vicinity. Specifically, the accounts refer to the gathering of wapato in ponds and sloughs. The accounts also refer to the presence of camas and other plant foods on prairies along the north and south shores of the river in this vicinity. Unfortunately, Lewis and Clark did not venture inland from the villages. At this point in time, any further information about settlement and land-use activities in the Columbia South Shore vicinity can only be obtained through archaeological research.

CHAPTER 6: ONGOING TRIBAL INTERESTS

Chapter 5 reviewed historical accounts of the early period of contact between the Chinookan peoples and the Euroamericans and Europeans. Those accounts, along with descriptions of plant use by American Indians (Chapter 4), need to carry into the present day. This chapter depicts the ongoing interests of the Indian community toward the Columbia South Shore. Sources of this information include communications with three Oregon Tribal governments, written accounts of those Tribes (including published interviews with tribal elders), and written accounts of heritage values of indigenous peoples.

From the outset of the Archaeological Resources Project, tribal representatives have drawn the City of Portland's attention to their rights on the land, ranging from treaty rights to aboriginal rights to rights protected by federal and state statutes. Tribal representatives want the City and property owners to recognize that, despite hardships, their culture is alive and that they maintain an active interest in protecting archaeological resources in Columbia South Shore.

PARTICIPATING OREGON TRIBES

In June 1993, Mayor Katz and Commissioner-in-charge Charlie Hales met with tribal representatives to hear of their interest in advancing archaeological resource protection in Columbia South Shore. The meeting also served to formally invite Tribal governments to participate in City issues. In October 1993, Commissioner Hales convened the first meeting of the Cultural Resources Advisory Committee, which includes three tribal representatives. The committee advises the Bureau of Planning on policy issues relating to archaeological resources, including stakeholder interests, confidentiality of site records, and methods to determine resource values.

Participating Tribal governments are the Confederated Tribes of the Grand Ronde Community of Oregon (hereafter, Grand Ronde), the Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs), and the Confederated Tribes of the Siletz Indians of Oregon (Siletz). Tribal representatives from Grand Ronde, Warm Springs and Siletz have actively contributed to discussions of the Cultural Resources Advisory Committee.

The Bureau of Planning has actively solicited comments from all three participating Tribes. Planning staff requested comments on the inventory, analysis and implementation phases of the project work at several intervals. First, staff invited the Tribes to comment on the consultant scope of work. Second, one

Tribal representative served on the interview panel to select the archaeological consultant. Third, staff has invited the Tribes to submit oral histories and any other information relevant to cultural resources in the plan area. Fourth, City staff and the consultant presented results of the archaeological fieldwork. Fifth, staff has kept tribal representatives informed of development activities in the interim period before this plan is adopted.

City staff met twice with each appropriate Tribal Council. Each first meeting served to reinforce government-to-government relations, describe the Secondary Infrastructure Plan and related development in the plan area, explain the Archaeological Resources Project work program, and invite each Tribal Council to participate on the policy advisory committee. Each follow-up meeting served to report on results of the areawide archaeological investigation and repeat the City's request for any comments, oral histories or other information that may enrich the City's Goal 5/archaeological resources inventory.

Tribal Council meeting dates and purposes follow:

<u>Date</u>	<u>Tribal Council</u>	<u>Purpose</u>
10/19/93	Warm Springs	Discuss proposed scope of work
1/15/94	Siletz	Same
1/26/94	Grand Ronde	Same
8/3/94	Grand Ronde	Discuss tentative survey results
2/18/95	Siletz	Same
2/28/95	Warm Springs	Same

In addition, Planning staff worked with the Grand Ronde Tribes and the Columbia Corridor Association to negotiate a private agreement, or Memorandum of Understanding (MOU), over interim procedures before permanent measures are adopted for the Archaeological Plan. Planning staff also attended a workshop on graves protection (Keepers of the Treasures) and heard Grand Ronde elders speak Chinookan jargon.

In testimony to the Planning Commission, the Grand Ronde and the Warm Springs tribes have stated a direct lineage to the plan area. Those letters are contained in Appendix F (under separate cover). Representatives of both tribes testified in favor of the Archaeological Plan before City Council.

A brief profile of each of the three participating tribes follows.

GRAND RONDE

The Confederated Tribes of the Grand Ronde Community of Oregon have had an illuminating struggle for survival. Ancestors of present day members of the Confederated Tribes of the Grand Ronde Community of Oregon lived in the Willamette Valley, the surrounding mountains and the northern portion of the Oregon coast. By 2,500 years ago, tribes who became part of the Grand Ronde Tribes had a fully developed Northwest Coast fishing culture in the vicinity of the mouth of the Columbia River. Pursuant to treaties and Executive Orders in 1854, 1855 and 1857, the United States removed over 20 Indian bands from their homelands and relocated them on the Grand Ronde Indian Reservation.

In 1954, the federal government "terminated" the Grand Ronde Tribe. During the termination period, the Grand Ronde Tribe was virtually a landless people on their own land. To most of the Tribe, and especially the Tribal elders, the termination was a loss of home and identity.

In 1983, through the efforts of the Grand Ronde Tribe, Congress reestablished the federal relationship with the Tribe by enacting the Grand Ronde Restoration Act. The Act provided that the Tribe be considered as one tribal unit for purposes of federal recognition, that the Tribe reestablish self-government, that a reservation be established and, most relevant to the Plan, the Act required that all rights of Tribes be recognized as rights of the Grand Ronde. Since restoration, the Grand Ronde Tribes have initiated a number of economic development activities, including constructing and operating a casino. In the twelve short years since restoration, the Grand Ronde Tribes have leveraged themselves into the position of being the largest employer in the West valley (Polk and Yamhill counties).

As the Grand Ronde Tribes diversify their timber-based economy, they also seek to preserve tribal cultures and traditions for all generations. A 1993 vision statement identified the preservation of culture as one of four key principles. The Tribe has created the Kwelth Talkhie (proud past) Cultural Board which will be active in the preservation of archaeological resources. The Tribe also plans to hire in the near future at least one full-time Cultural Resources Expert with casino revenues. In conjunction with the Tribal Attorney, the Cultural Resources Expert will be responsible for responding to notices to the Tribe relating to archaeological site discoveries and permits and developing and maintaining effective working relationships between the Tribe and government agencies and archaeological organizations in matters relating to tribal cultural resources.

The Grand Ronde Tribes have signed two Memoranda of Understanding (MOU's) with business interests in the plan area. First, the Grand Ronde Tribes signed a MOU with Art Spada, an owner of property just west of NE 185th Avenue. The second MOU is with the Columbia Corridor Association, as described above. The

Grand Ronde Tribes are interested in continuing to develop cooperative agreements with developers, associations and local governments.

WARM SPRINGS

The Warm Springs Tribes state that the American Indians inhabited the Pacific Northwest for thousands of years prior to European and American contact. They hunted, fished, gathered plant foods, buried their dead, and conducted religious ceremonies "since time immemorial."

In the Middle Oregon Treaty of 1855, the Warm Springs and Wasco tribes ceded ownership of ten million acres to the United States while reserving to themselves the exclusive use of their reservation lands. The Warm Springs Reservation is approximately 641,000 acres in Central Oregon. The Warm Springs Tribes also own off-reservation lands.

Through testimony to the planning commission, the Warm Springs Tribal Council has stated that it has a vital interest in the development of a plan to protect important tribal cultural resources located in the Columbia South Shore. The Confederated Tribes of the Warm Springs Reservation is the legal successor in interest to the seven bands of Wasco and Sahaptian speaking Indians who were signatory to the treaty with the Tribes of Middle Oregon of June 25, 1855. Among the treaty signing tribes and bands were three bands of Wasco speaking Indians whose aboriginal territory occupied the south shore of the Columbia River from roughly the present day location of the Dalles, Oregon, downstream and westward toward Portland to the Cascade Falls, which is the present day location of the Bonneville Dam. These Wasco speaking Indians were the eastern most bands of Indians belonging to the Chinookian language group. The Wasco treaty signing bands, as well as Sahaptian speaking treaty signing bands, were frequent travelers to the lower Columbia River, both the north and south shores, including the south shore covered by the proposed plan, and occupied the lower Columbia River from time to time for trade, hunting and fishing, and fishing, and intermarriage with other bands.

American Indians of the Columbia Plateau attach special religious meaning to ancestral grave sites and traditional locations for cultural and spiritual ceremonies, including quest sites. The Warm Springs Tribes state that practicing their traditional customs may be among the most important qualities in their lives. "Some would say the opportunity to gather their traditional foods and materials is beyond price."

The Warm Springs Declaration of Sovereignty (1992) asserts off-reservation rights to include usual and accustomed fishing grounds and stations, in-lieu fishing

sites, burial sites and other sacred sites, lands on which tribal members can hunt, gather roots and berries, and pasture livestock. "It shall be the right and duty of the Tribal Council to define the nature and scope of such treaty rights."

The Columbia South Shore is off reservation and beyond the ceded area. The Warm Springs declare off-treaty rights beyond the ceded area, to include the plan area. Within the plan area, Warm Springs representatives have expressed interest in protecting burial sites, other sacred sites, and areas to gather roots and herbal medicines.

In 1987, the Warm Springs Tribal Council adopted Ordinance 68 (see Appendix D of this report). Ordinance 68 set in motion a process for the Tribes to 1) issue archaeological permits, 2) describe tribal use traditions, and 3) designate archaeological, cultural and historic sites. Regarding permits, Ordinance 68 holds all tribal-initiated land use actions to possible impact on archaeological, historical and cultural sites and materials. The Warm Springs have a tribal archaeologist on staff and require archaeological surveys in their forested areas.

Regarding tribal traditions, Ordinance 68 designates certain cultural materials to be significant. Archaeological evidence (Chapters 7 and 8) has been found in the plan area for the following listed cultural materials: water, salmon, sturgeon, camas, and pine nuts. Other cultural materials that were likely present in the plan area include deer, cedar bark, willow, alder, and Indian herbal medicines. The Warm Springs Museum and Cultural Center serves as the repository of cultural materials from tribal land, and contains cultural site information from ceded lands.

Consistent with the Warm Springs Declaration of Sovereignty, Tribal Ordinance 68 states the intent to protect tribal interests on the Reservation, in the ceded area, and outside the ceded area. The ordinance opposes all activity outside the reservation that adversely affects their treaty rights. It encourages the use of memoranda of agreement with appropriate persons and agencies to implement Ordinance 68 policies. Finally, Ordinance 68 supports State LCDC Goal 5. The Warm Springs Tribal Council is to designate sites outside the Warm Springs Reservation and report findings to state and local officials. The Secretary-Treasurer is to develop expedited procedures to evaluate Goal 5 sites in areas under development.

SILETZ

As with the Grand Ronde Tribes, the Siletz Tribes were removed from aboriginal lands in Western Oregon, and lost federal recognition in 1954. Over 27 Indian bands, each with a distinct language and culture, were relocated to a reservation that originally contained 1,382,400 acres and extended nearly 125 miles along the central Oregon coast. Three-quarters of this land base was lost between 1865 and 1910, causing economic hardships and displacement within and away from the reservations. In 1977, federal recognition was restored to the Siletz Tribes; the reservation now consists of 3,666 acres in the central coast range.

OTHER INDIAN COMMUNITIES

While the City of Portland has formally established government-to-government relations with three confederated tribes (Grand Ronde, Warm Springs and Siletz), a number of other American Indians have also expressed interest in this project. One of the urban Indian organizations is the American Indian Association of Portland (AIAP). The AIAP brings together thirteen Indian organizations that serve Indians in Multnomah, Washington, Clackamas and Clark Counties. The AIAP works to improve communications, expand resources, improve relationships, and advocate for social, cultural and economic improvements for the urban Indian community.

In the 1990's, the Cultural Center Committee of AIAP explored with the City of Portland Bureau of Parks and Recreation the use of Delta Park to locate a Native American cultural center. In December 1992, City Council passed Resolution 35087, establishing a site in East Delta Park for an American Indian Cultural Center. A more urban site, in collaboration with Portland State University, was actually built.

In 2003, the Native American Student and Community Center opened at the corner of SW Broadway and Jackson Street, at the southern terminus of the PSU campus. The center was designed in collaboration with the Native American community. The center provides a meeting place for Native Americans throughout the region to gather, celebrate cultural traditions and discuss issues facing their communities. Visitors can learn about Native American traditions and historical and contemporary issues of importance to indigenous peoples.

HERITAGE VALUES OF INDIGENOUS PEOPLE

Many American Indian people share traditional values which must be addressed in order to understand their point of view in regards to this project. There are several different tribes of Indian people in America. Each tribe has their own unique culture and lifeways. For the limited scope of this report, a few observations will be made regarding the common uniting values of these many peoples.

1. Place and the “system of place” is an important part of Indian culture. Tribal representatives care about this project because the historical and spiritual connection between living American Indian peoples and their ancestors is communicated through their connection with the land. The land provides physical and spiritual sustenance as well as a connection to the past. Each of these elements is enhanced by the existence of cultural sites and their environmental context. Without a connection to the past, American Indian descendants would lose a vital part of their social fabric and, therefore, their identity as a distinct and valuable culture.
2. The importance of the oral tradition is a valued way of life.
3. All actions should consider seven generations backward and forward.
4. They are still interested in traditional lifeways, especially the use of traditional plants and animals. Often gathering is performed in a ceremonial manner that is necessary to the success of the spiritual practice in which the materials will be used. In some ways, their beings are tied to the preservation of traditional culture.
5. Participating Tribes understand that Columbia South Shore is an employment district. The Tribes are engaged in their own economic development activities as well. They support development that respects important archaeological resources.
6. Tribes are interested in forging partnerships with public agencies (including the City of Portland) and signing private agreements (MOU's) with private landowners.
7. The connection between American Indians, living and dead, cannot be overemphasized. Traditional beliefs regarding the dead include the understanding that the well-being of the living is tied to the well-being of the dead. For example, the disturbance of American Indian remains that

have not been allowed to go back completely to the earth is considered by many to make every significant effort of the Tribe tinged with failure.

TRIBAL IDENTITY AND PLACE

The important relationship between place and the American Indian reflects, in part, a profound reverence of and connection with, the land. The geography of particular places forms the lifeways, religion and cultural identity of the tribes. Places are significant holders of shared information colored by the memory of generations.

“The system of place to which tribal history is tied, functions as do maps and documents in societies with their own written records. When the landscapes are destroyed or the people are removed from them, the people lose reminders of these stories, and soon lose the stories themselves. If those landscapes and stories are lost, the people will have lost their own version of their history.” Kelly and Francis, Places of the Navajo, pp 38-39.

The sites in question continue to hold the memory of the tribes. Having access to these sites makes it possible to practice traditional activities such as gathering plant materials and their fruits for spiritual/ceremonial uses and remembering the history of their people. Continuity and maintaining a shared heritage for their children is important to the tribes.

Comments of Warm Springs Elders

In the Book of Elders: The Life Stories of Great American Indians, three Warm Springs elders explain river experiences of one of the three tribes in the confederation (Wasco), the oral tradition, and root gathering. Apparently, the Warm Springs may hold other relevant oral histories, but are careful to honor the wishes of the elders before releasing sensitive information to the general public.

A Warm Springs elder, Nettie Queahpama, discusses the experiences of the Wascos (one of the three tribes in the confederation) along the Columbia River. “People lived all up and down that river, because it was warm in the wintertime. They lived there for many years. Later on, the government moved the Wasco people from the Columbia River, and our people said it was all right to live by Warm Springs. That’s where the Wascos settled.”

As to the oral tradition as a source of knowledge, Verbena Greene (Warm Springs) stated “I can go back quite aways in our ancestry, at least five generations of Medicine Singers... Medicine Singing goes back to the beginning of time with our people. They sang for survival; they sang when times were hard.”

We are where we are today because of all the Medicine People that went before us. They learned singing through the vision quest."

Another Warm Springs elder, Sylvia Walulatuma, described root harvests, the importance of protecting Mother Earth, and challenges to educate children in the face of drug use. She described how Indians barbecued camas in the ground. They held ceremonies, including a root feast, to give thanks to the Creator for roots, salmon and water.

ORAL TRADITION IN AMERICAN INDIAN CULTURE

The oral tradition is that process by which the history, and lore of a people are preserved in language by word of mouth over generations. In societies that had no written language, value was placed on remembering this information and passing it on intact to the next generations. Oral transmission of cultural knowledge is inherently fragile. It has always been one generation removed from extinction but what remains is as carefully guarded and revered as the elders who are the keepers of that knowledge.

Other sources of historical evidence include written documents, archaeological finds, written reminiscences. For any source, there is a debate concerning authenticity especially concerning ethnic history.

"The primary characteristic of 'colonized' history is that it is the view of outsiders and not the people themselves. The historical evidence upon which that variety of history draws from is the colonizer. Usually this is in the form of written documents - letters, diaries, and reminiscences of visitors - which describe the author's position among the people and his or her perceptions of that people. For various reasons, from the resumption of the primacy of written documents over oral ones to the assumptions that the elite are the only ones who matter historically, the people themselves are ignored and are not asked about their perceptions of history. As a consequence, the actions of the colonizers are magnified so they become the central figures in the narrative; they are portrayed as the historical actors while the people are rendered as passive, powerless objects." (Okiehiro, Oral History: An Interdisciplinary Anthology, pp. 199-200).

In the case of Columbia South Shore archaeological evidence and written historical data support the tribes' assertion that village sites, burial sites and sites of important tribal food sources are present in the area. Task-specific sites likely served to extract plant materials for food, shelter, basket making and medicines. Given the documented use of this area, burial sites may also be encountered by ground disturbance activities.

SEVEN GENERATIONS

Tribal values among many American Indians relate to the concept of "seven generations." This concept means that any action that is taken should prove beneficial to the seven generations that follow the current generation. This concept instills a sense of connection between the world and all its inhabitants, human, animal and other. Seeing the earth and its inhabitants as an interconnected living being is a concept advanced science is only now recognizing. For American Indian people, this knowledge has always been an integral part of their heritage. The past and the present are linked, as are the present and the future. Time has a circular aspect.

Many traditional activities take place seasonally and are connected to gathering specific food sources. The gathering of these foods took place in specific places where the food was available. One way to preserve the heritage of American Indian people today is to provide for traditional food gathering opportunities along the Columbia Slough.

SITE PRESERVATION TODAY

Above all, Tribal representatives want human burial sites be preserved. To date, no burial sites have been reported in the planning area. However, burial sites may be encountered with development. Tribal representatives have also stated that traditional use sites provide an important means to preserve their heritage. Some of the sites in question are ancestral villages or campsites; some may contain burial sites.

Other sites still produce food sources important for tribal use. The Confederated Tribes of Warm Springs lack the micro climate needed to grow camas or wapato root; both plants are traditional food sources. Tribes would like access to the sites in order to teach members of the Indian community about traditional lifeways practiced over generations.

For non-Indian people, these sites help us to gain insights on the history of the Columbia River. By protecting the sites and allowing the Indian population to practice their traditions, the larger community gains knowledge of the area's original community. In 2005, the commemoration of Lewis and Clark's journey reaches its two hundredth anniversary. These sites could be a resource for educating school children, local residents and tourists about a living culture with much to teach the community at large. As people learn more about one another,

stereotypes break down and a dialog emerges between people of different cultures who share the same landscape.

SUMMARY OF TRIBAL INTERESTS

The Bureau of Planning has heard the following points from participating Oregon tribes:

1. They care about archaeological resources because ancestors lived throughout the Columbia River basin. They care especially about graves and sacred places. The dead are believed to be alive and to influence the lives of the living in profound ways.
2. Traditional values place man as part of nature. It is important that man live in harmony with the natural world.
3. Actions should consider seven generations back and forward.
4. They are still interested in traditional lifeways, especially the use of traditional plants and animals. In some ways, their beings are tied to the preservation of traditional culture.
5. Participating Tribes understand that Columbia South Shore is an employment district. The Tribes are engaged in their own economic development activities as well. They support development that respects important archaeological resources.
6. Tribes are interested in forging partnerships with public agencies (including the City of Portland) and signing private agreements (MOU's) with private landowners.

A diagram of the annual cycle of traditional Indian activities is found as Figure 7.

Figure 7: Annual Cycle

Figure 7 ANNUAL CYCLE OF INDIAN ACTIVITIES



CHAPTER 7: ARCHAEOLOGICAL INVESTIGATIONS

This chapter presents an overview of archaeological research, field investigations, a land use model and general findings for the Columbia South Shore (plan area). The data is general in nature, in order to protect archaeological site locations. Recorded archaeological sites are identified by Smithsonian number system used by the State Historic Preservation Office (SHPO). For, instance, 35 MU 70 refers to the 70th site to be recorded in Multnomah County (MU), in the state of Oregon (35). For more detailed findings of the areawide investigation, see the Goal 5 inventory descriptions (Chapter 8).

PREVIOUS ARCHAEOLOGICAL RESEARCH

This section addresses the extent of knowledge of archaeological resources in the plan area prior to the City's 1994 investigation. Prior to 1994, archaeological investigations were carried out by Portland State University (PSU), the Oregon State Museum of Anthropology at the University of Oregon (OSMA), Heritage Research Associates, Inc. (HRA), and Archaeological Investigations Northwest (AINW).

The archaeological projects represent three successive stages. The stages (site discovery, evaluation, and mitigation) are briefly described below. Appendix E provides more details on site discovery techniques.

1. Site discovery--Also called archaeological survey, site discovery generally involves a systematic walkover of a property to locate evidence of past activity exposed on the ground surface. As evidence of occupation on floodplains tends to become obscured by deposition of sediments during seasonal floods, it has become common practice to supplement surface surveys with auger excavations in an effort to locate buried archaeological deposits.
2. Evaluation--Once cultural materials and associated archaeological deposits are located, their definition and evaluation usually require controlled test pit excavations.
3. Mitigation--While conservation of archaeological resources is always the most desirable option, in cases where impacts to significant sites are unavoidable, these impacts may be mitigated through data recovery excavations.

The plan area received two large-scale archaeological surveys (in 1979 and 1989). More recent research has been initiated by property owners or developers. These project-driven projects involve surface surveys and testing to determine the significance of any archaeological resources identified. Some surveys led directly into testing and, in two cases, resulted in data recovery excavations.

The City's consultant reviewed data on all recorded sites and all site investigations conducted in the plan area prior to 1994. To place the plan area in its context, the consultant reviewed site investigations for the Blue Lake vicinity (to the east).

FINDINGS

At the time the present study began in 1994, 17 archaeological sites had been recorded within the Columbia South Shore study area. Of these, six sites had been subjected to test excavations of varying intensities for the purpose of establishing their significance. Two sites were considered significant and subjected to data recovery investigations before they were destroyed or otherwise affected by development. Another site was considered significant, and an alignment for NE Airport Way was selected that avoided impacts to the site. Testing at one site was inconclusive. The remaining two excavated sites, 35MU97 and 35MU99, were considered not significant.

Of the six sites where archaeological investigations were conducted, one site represents a small seasonal village, based on the discovery of two houses. A second site represents a "specialized activity locus" where camas processing took place. Two other sites contained fire-cracked rock and charcoal concentrations indicating the former presence of rock hearths or ovens, but little in the way of artifacts. Another site consists of archaeological materials limited to the ground surface, with no associated subsurface archaeological deposits. The sixth site also consists primarily of archaeological materials on the ground surface, but charcoal lenses found deep below the ground surface in one auger hole remain to be investigated.

Before this project, chronological information on prehistoric use of the Columbia South Shore had been obtained through 17 radiocarbon dates from four different sites. These dates range from an assay of 2420 ± 70 BP (before present) from one site to an assay of 180 ± 60 BP from another site. Contrary to Lewis and Clark's records of villages, none of the six sites where archaeological investigations were conducted has yielded items of Euroamerican manufacture, suggesting little archaeological evidence to indicate use of the project area in the early historic period.

LAND USE MODEL

The City's consultant reviewed data already collected to better understand the relationship between the locations of prehistoric sites and various environmental settings within the plan area. The ultimate goal was to create a land use model to assist in predicting likely locations for prehistoric settlements in the plan area.

For the environmental framework, the consultant reviewed early historic maps and survey notes for the area, and defined environmental variables. The consultant reviewed ethnographic data and the patterning of known sites. The environmental variables provided a basic framework to evaluate site information and subsurface augering results for the 1994 investigation.

As reviewed in Chapter 3, the surface of the South Shore has evolved over time through the deposition and erosion wrought by frequent flooding over several thousand years. When combined with the effects of farming, filling, tiling, channelizing waterways, and the construction of levees, dikes, and dams, particularly within the past decade, the area has been altered sufficiently so that specific features evident as of this writing may not reliably reflect those present at the time of historic contact.

The most useful map for the present project, dated 1917, was compiled by Multnomah County Drainage District No. 1 in preparation for construction of a ditch and dike system along the Oregon side of the Columbia River, work that eventually spanned several decades. The drainage district map provides a detailed snapshot of the topography (at 5-foot intervals), channels, levees, and basins present in the plan area in 1917.

ENVIRONMENTAL RECONSTRUCTION

The consultant used pre-dike sources (1850-1920) to construct a composite landform map of the pre-contact environment (circa 1800). This reconstruction was based on the 1917 drainage district map, a 1904 U. S. Coast and Geodetic Survey chart, and the 1905 and 1918 U. S. Geological Survey quadrangles, overlain on modern landform surveys. Long-term hydrologic data from the U. S. Corps of Engineers provide also show likely marsh and open water areas relative to available elevation data. (Elevations are defined in terms of feet above mean sea level in relation to the USGS datum.)

When broad plant communities were overlaid on three elevation intervals, four general zones were evident (see Figure 8):

1. Elevations below 15 feet, consisting of the open water of **sloughs and ponds**; this zone correlated primarily with the floating and submerged

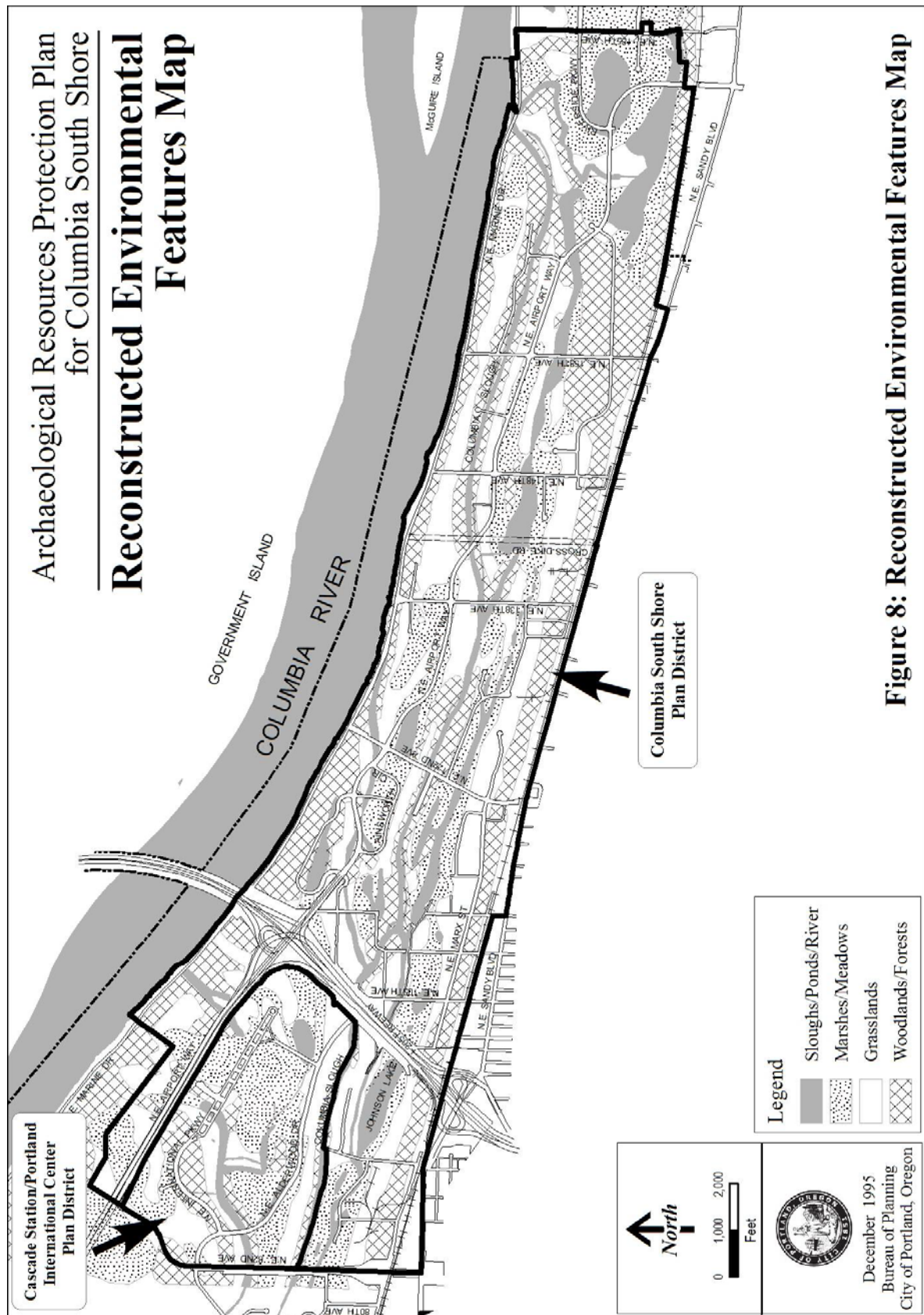
plant communities (PAB) that are less botanically productive, although they attract fish, waterfowl, and other wildlife.

2. Elevations between 15-20 feet, consisting of **marshes and wet meadows**; this zone is composed of emergent wetlands (PEM) often dominated by wapato; this zone may also include occasional fringe areas of forested swamp and scrub shrub.
3. Elevations above 20 feet, consisting of open **grasslands**; these wet or dry prairies or meadows are sometimes a part of wetland systems and are most notable for supporting camas.
4. Elevations above 20 feet, consisting of **woodlands and forests**; because this zone includes a relatively wide range in elevation (up to 40 feet), it encompasses a range of woody communities, including riparian woodlands and forested uplands (along the south bank of the Columbia River and along the foothills of the upper terrace to the south), palustrine forested wetland (PFO), and palustrine scrub/shrub (PSS) communities that supported varying understories including a variety of berries.

As mapped in Figure 8, the plan area divides into the four zones, as follows:

1. sloughs and ponds (11 percent)
2. marshes and meadows (28 percent)
3. grasslands (29 percent)
4. woodlands and forests (32 percent)

With the land use model (reconstructed environmental zones) in hand, the City's consultant began the 1994 field inventory. The consultant draws some conclusions from the land use model in the next section.



The archaeological field inventory included three phases of fieldwork: 1) an intensive surface survey of undeveloped acreage; 2) survey and subsurface probing of previously recorded archaeological sites; and 3) subsurface probing of selected areas outside of known site boundaries. The third phase of fieldwork was designed to investigate subsurface contexts in areas where artifacts had been observed on the ground surface during the survey, and in the various zones defined by the preliminary land use model.

SURVEY AND EXCAVATION METHODS

The Bureau of Planning requested landowner permission for access to certain parcels in the plan area with known archaeological sites and other undeveloped parcels. A high proportion of landowners gave permission. Those parcels for which no permission was granted are shown on Figure 9.

For the surface survey, the consultant sent out a team of 2 to 6 archaeologists walking parallel transects back and forth from one end of a parcel to the other. Individual transects were spaced 10 to 15 meters (33 to 50 feet) apart. Any artifacts observed during the survey were flagged and then later mapped.

For subsurface work, the consultant used a heavy-duty soil auger with a 20 cm (8-inch) bore. The holes were dug in arbitrary 10 cm levels, and the fill from each auger hole was screened. All probes were excavated to the maximum reach of the auger (250 cm) unless the holes were blocked by obstructions, reached the water table, or encountered impenetrable sediments. Once excavation was completed each unit was immediately backfilled. Charcoal samples were also collected from non-cultural contexts in an effort to obtain for radiocarbon dates from buried landforms in the project area.

The consultant typically surveyed the entire parcel along with a recorded site. Any surface artifacts observed were flagged and recorded. Auger probes were then placed within the original recorded boundaries of the site. The auger probes were usually placed along one or more lines across each site, paying particular attention to areas in which surface evidence had been noted, either during previous surveys or during the present project. The auger probes along each line were spaced systematically at intervals of 20 or 30 meters (65 or 100 feet) unless subsurface archaeological material was encountered, in which case auger probes were usually placed at closer intervals to determine the nature and extent of the discovery. At the conclusion of the auger probe excavations, the surface artifacts and auger probe locations were mapped using a surveyor's transit and stadia.

The consultant surveyed some 425 acres on 29 individual parcels (see Figure 9). Most of the surveyed acreage (390 acres) was located between NE 138th and NE

185th Avenue, with 35 acres surveyed west of NE 138th. Ten of the parcels contained portions of previously recorded archaeological sites that had not yet been field verified.

The consultant resurveyed much of the land previously surveyed. This allowed the consultant to determine if continued farming had brought archaeological materials to the surface that were not exposed during the earlier study. Most of the other areas in which previous archaeological resource projects have been more recently conducted were not reexamined, however, as in most cases these areas have been significantly altered from their natural state by the placement of deep fill or the excavation of ponds.

All of the parcels located west of NE 138th Avenue that were designated as undeveloped have been severely altered from their natural state either by removal of top soil or by deposition of deep fill. A number of these properties were observed from the street. No archaeological materials were observed on any of the parcels west of NE 138th.

CUMULATIVE SURVEY COVERAGE

As of July 1994, nineteen separate archaeological survey efforts had been conducted within the Columbia South Shore by July 1994. The City's investigation resulted in the survey of 425 acres or 25 percent of the approximately 1,700 undeveloped acres within the South Shore.

When all survey projects are combined, more than 1,000 of the 1,700 undeveloped acres (59 percent) have been intensively surveyed to date, primarily at intervals of 5-15 meters; with the inclusion of 1,100 developed acres, the surveyed areas encompass 36 percent of the total 2,800 acres. Both the proportion of surveyed acreage and intensity of survey coverage is relatively high by archaeological standards, making the Columbia South Shore one of the most intensively surveyed areas in the state of Oregon.

More than 70 percent of the total acreage between NE 138th and 185th avenues (approximately 800 of 1,100 acres) has been surveyed to date. The proportion of developed land east of NE 138th is relatively low (approximately 10 percent or 100+ acres), leaving only about 200 undeveloped acres that have not been surveyed in this portion of the project area.

West of NE 138th Avenue, only 220 of 1,700 acres have been intensively surveyed, for a sample of approximately 13 percent. Developed acreage is much higher in this section of the South Shore, however, and it is estimated that less than 400 undeveloped acres remain to be surveyed in this area. Because the

emphasis of this project was on lands east of NE 138th Avenue, only 35 acres were surveyed in the western portion of the South Shore.

SUBSURFACE PROBING COVERAGE

In addition to being proportionally well surveyed, the Columbia South Shore may well be the most intensively probed project area of its size in Oregon. Fifteen of the 19 archaeological projects incorporated probe excavations into their field designs. Overall, the correspondence between probes and surveyed acreage is quite high--approximately one probe per acre. This rough correspondence holds true both east and west of NE 138th Avenue. A total of 1,025 probes have been excavated in the South Shore, of which 348 (34 percent) were excavated during the present project.

SUMMARY OF FIELD INVENTORIES 1996 THROUGH 2003

Provision for new studies

The Archaeological Plan anticipates that new information on the inventoried sites may be provided over time. Situations that may yield new information include:

- Results of confirmation testing, and
- Results of voluntary archaeological testing.

Either action may or may not identify new archaeological resource sites to receive protection by the Archaeological Plan. And, once confirmation testing is complete, Zoning Map 515-7 should be updated accordingly. This 2004 update of the Archaeological Plan reflects new information that was obtained in both types of situations.

Confirmation testing

Between the Archaeological Plan's first adoption in April 1996 and December 2003, the Bureau of Planning issued zoning confirmation letters on six properties to recognize the completion of required auger testing. This confirmation testing accomplished requirements for 47 auger probes. There are 53 auger probes still to be completed. The proposed changes to Map 515-7 reflect this change.

Voluntary testing

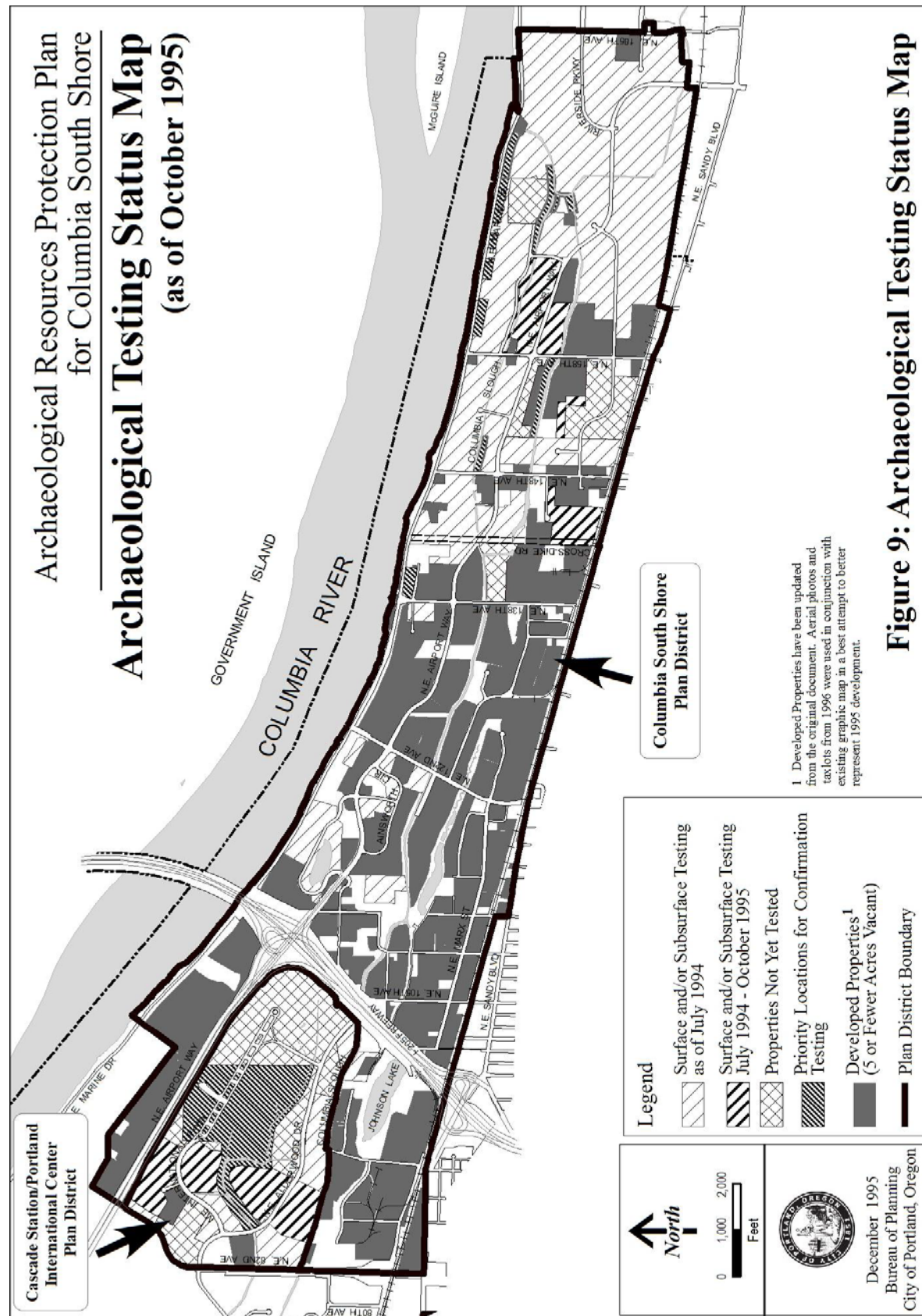
In addition to required confirmation testing, two owners hired archaeological consultants to perform voluntary archaeological testing, resulting in recommended changes to two known archaeological resource sites in the Archaeological Plan. The archaeological resource sites are 35 MU 82 and 35 MU 26. Details of these studies are found in Chapter 8, Goal 5 Inventory Sites.

Due to the sensitive nature of archaeological site records, detailed site maps are kept confidential. However, the City shares site records on a need-to-know basis. Individual requests to view site records follow a non-disclosure agreement process.

FINDINGS

As of December 2003, nine sites have been confirmed as potentially significant within the 2800-acre project area. These sites are disproportionately located at the east end of the project area. The overall site density is quite low, enhancing the value of each site that has survived erosion, flooding, farming, and development. The nine known sites include a likely winter village, a summer habitation site, and a series of smaller task-specific camps, most probably related to the harvesting and preparation of floodplain resources such as camas and wapato.

The American Indian community is particularly concerned about the potential to discover burials. No human remains have yet been recovered at any of the recorded archaeological sites within the project area. Human remains have reportedly been found east of the project area.



UPDATED MANAGEMENT RECOMMENDATIONS

The archaeological investigations through December 2003 bring forward new information on the patterning and extent of archaeological sites in the plan area. The sum of these investigations yield these observations and recommendations:

1. Likelihood of site discovery. Most, if not virtually all, of the surface-evident archaeological sites within the project area have been discovered. Most of the sites remaining to be discovered within the South Shore will consist of buried archaeological deposits.

Overall, the chance of encountering an archaeological site on any given acreage in the South Shore is relatively low. The nine confirmed sites are situated within a total of 13 acres, or 1.2 percent of the 1,100 acres between NE 138th and 185th Avenues. If the existing site inventory and the declining yield of discovered sites in recent years is representative, the likelihood of encountering a previously unrecorded site on any particular acre in the South Shore by archaeological sampling method would appear to be significantly less than 1 percent. This likelihood drops to well below 0.5 percent for the entire project area. While the presence of an archaeological site does not appear to be an imminent likelihood for most properties within the project area, the need for vigilance in the discovery and protection of archaeological sites remains.

2. Surface survey. It is estimated that less than 600 of the 1,700 undeveloped acres within the project area have not been covered by a pedestrian archaeological survey. In the rapidly developing eastern portion between NE 138th and 185th Avenues, approximately 200 acres remain unsurveyed. Roughly 70 percent of the 574 acres projected for development by the year 2015 have been surveyed. The source of this buildout schedule is the draft *Airport Way Secondary Infrastructure Plan*. The consultant recommended that previously unsurveyed parcels receive surveys on a lot-by-lot basis. These surveys may either be initiated during a property transaction or as a part of the City's permit review process.
3. Site discovery methods. Surface survey by itself is not an adequate method for site discovery. Nearly half of the confirmed archaeological sites in the South Shore were not marked by any surface evidence. Subsurface site discovery can be addressed 1) in advance of project disturbances (during a survey/site discovery project carried out by archaeologists), and/or 2) in the course of project implementation. It can be disruptive and expensive to discover a site after a development project has commenced. As a result, recent developments in the plan area have

conducted surface surveys and auger probes at the front end. This approach is the best way to discover archaeological sites as early in the process as possible, so that significant archaeological resources can be avoided or mitigated prior to initiation of project disturbances.

The auger and coring instruments commonly used by archaeologists can penetrate to a depth of approximately 2 meters (8 feet) from the ground surface, and are generally adequate for site discovery purposes. Any attempts to dig deeper using more sophisticated equipment (such as drill rigs and backhoes) would add cost and enter the water table. Likewise, scanning techniques are generally quite costly, often provide ambiguous results, require additional subsurface testing for verification, and would most likely be foiled by the geologic composition of the floodplain. While it has been suggested that archaeological remains as much as 6,000 years old could potentially be found in this area, it is speculated that such evidence would be deeply buried beyond the reach of standard archaeological discovery techniques, possibly lying as deep as 10-30 meters (33 to 99 feet) below the present surface.

Depths of 10-30 meters are occasionally reached during the course of project disturbances, including geotechnical borings, backhoe trenching, and site preparation. Monitoring of these disturbances by an archaeologist or other informed monitor after site construction has begun would provide an opportunity to supplement a pre-project survey. Although the monitoring of drilling and backhoe trenching has been conducted to a limited extent in the South Shore, the presence of archaeological deposits below 8 feet has not yet been confirmed. If deeply buried sites are present, they are expected to be uncommon, but construction personnel and others should be alert to their possible occurrence.

4. Discovery probing. During the 1994 investigation, a number of tracts within the project area were intensively surveyed and probed for archaeological sites. The consultant delivered to the Bureau of Planning a set of maps, east of NE 138th Avenue, (1 inch = 200 feet) that locate each probe excavated to date and confirmed site areas. Due to nonparticipating owners and budget constraints, some parcels were not intensively tested by subsurface means.

The consultant recommended small-scale probing of partially developed and/or partially investigated lots, depending on the nature and specific setting of future undertakings. The consultant recommended that the Bureau of Planning 1) consult the detailed maps of probe and site

locations, and 2) consider subsurface probing of certain untested landforms. Three landforms to test include:

- a. areas within 100 feet of an historic slough bank;
- b. areas within 100 feet of Marine Drive; and
- c. areas within Zone 2 (15-20 feet elevation), particularly along historic ponds, lakes, or marshes

Further, the consultant recommends that any parcels excluded from the survey requirement (e.g., less than 5 acres undeveloped) should be monitored during ground disturbance activities to ensure that any unearthed archaeological sites are recorded.

5. Site discovery during project implementation. Project development will expose far more ground area than archaeologists can feasibly probe. Sites may be exposed during project construction. As a result, the Bureau of Planning should consider drafting, in consultation with the appropriate Tribes, measures similar in form and scope to those set forth in the "Memorandum of Understanding (MOU) for Interim Voluntary Cultural [Archaeological] Resource Protection Measures" recently agreed to by the Columbia Corridor Association and the Confederated Tribes of the Grand Ronde Community. Elements of this MOU include an advance survey and discovery probing as appropriate, evaluation of identified resources, formulation of mitigation/avoidance options, education of in-field project personnel, and proper handling of Indian burial sites. These measures are intended to evaluate and protect or mitigate potentially significant resources that may be uncovered once a project is underway, as set forth in the Oregon statutes (Chapter 2).
6. Protection of confirmed archaeological resources. As of February 2004, nineteen archaeological sites had been recorded in the Columbia South Shore. The site records vary in level of detail, and are refreshed as new archaeological work occurs. Before 1994, the primary method of study was surface surveys. Since 1994, the focus has been on subsurface studies (auger probes and trenches). Work has been conducted as part of the City's 1994 areawide investigation, more recent confirmation testing, and two voluntary studies conducted in late 2003.

For purposes of protection, SHPO now considers seven of those sites to be significant or potentially significant (that is, they may qualify for listing on the National Register of Historic Places). Another two recorded sites (35 MU 57 and 35 MU 97) were determined to be significant, but no longer need protection because data was recovered and removed.

Seventeen of the recorded archaeological sites in Columbia South Shore came from archaeological work conducted before 1994. Since 1994, two new sites have been recorded - 35 MU 103 and 35 MU 106. Nine of the original seventeen recorded sites are now considered non-significant sites (not eligible for federal listing). The two recent voluntary studies concluded that one recorded sites (site 35 MU 26) is a non-site, and that site boundaries of another recorded site (35 MU 82) should change

Although available data are limited, it appears that 35 MU 70 is of National Register quality. The auger probing suggests that 35 MU 70 has a significantly greater density of artifacts than other sites investigated during the 1994 investigation. Further archaeological documentation will be necessary in order to formally assess this site. Of the eight confirmed sites in the plan area, this site appears to have the greatest potential for public interpretation of archaeological resources.

Two sites, while potentially significant, also require further archaeological testing in order to determine their integrity, extent, and significance. Sites 35 MU 79 and 35 MU 103 appear to be quite small in area (0.1 acre each), but they may contain intact archaeological features pertaining to task-specific activities that would make them significant.

Extensive archaeological work, including the 1994 areawide inventory, confirmation testing, and two voluntary archaeological studies, have occurred in the Columbia South Shore. The City can manage some situations, but not discovery situations. The 1994 consultant recommended that developers contact the appropriate American Indian Tribes and the qualified archaeological community prior to ground disturbance.

TECHNICAL REVIEW

Original plan

For the original archaeological plan, the Bureau of Planning asked members of the Cultural Resources Technical Committee, the state archaeologist and participating Tribal governments to review preliminary work of the consultant. The technical committee included an anthropology professor (Dr. Kenneth Ames), two federal archaeologists (Dr. Richard Hanes, Bureau of Land Management, and Lynda Waski-Walker, U. S. Army Corps of Engineers), two cultural resource advisors (Judith Basehore-Alef, consultant, and Lawrence Watters, counsel to Columbia River Gorge Commission) and representatives of City departments. Participating City departments included Portland Development Commission, Portland Office of Transportation, Bureau of Environmental Services and Bureau of Water Works.

The state SHPO archaeologist (Dr. Leland Gilson/SHPO) issued the areawide archaeological permit and maintains official site records. Current Tribal government representatives include Louie Pitt, Jr./Warm Springs, Robert Kentta/Siletz, and Janis Searles for Grand Ronde.

2004 Update

To satisfy the City's requirements for confirmation testing, applicants submit reports from qualified archaeologists. The Bureau of Planning reviews the archaeological reports against the zoning code requirements for the number and spacing of auger probes. For certain developments, the applicant also secures an archaeological permit from SHPO. Such reports involve notice and review by the SHPO Lead Archaeologist and affected Oregon Tribes.

Both voluntary reports received SHPO archaeological reports. On January 27, 2004, Dennis Griffin (SHPO's Lead Archaeologist) issued a letter concurring with both report recommendations. In the case of Site 35 MU 82, Mr. Griffin concurred with the amended recommendation for the contract archaeologist. Details of these reports, and SHPO's concurrence letter, are found in Chapter 8 of the Archaeological Plan.

CHAPTER 8: GOAL 5 INVENTORY SITES

INTRODUCTION

The previous chapters outlined the background and policy framework for the present plan. The first part of this chapter describes resource functions and values associated with archaeological resources in the plan area. The method used to select and inventory resource sites is then outlined, followed by an explanation of the format used in examining resource sites. Next, inventory resource sites are described. The chapter concludes with a process to consider new archaeological site information (archaeological surveys and oral histories).

In its periodic review work program (Proposed Local Review Order, City of Portland Resolutions 34523 and 34653), the City of Portland identified the Columbia South Shore as one of the most likely locations in the city for archaeological resource sites. The City hired a consultant team to assess the presence of archaeological sites and objects, and met with three appropriate Tribal governments to solicit heritage information from their oral tradition. Peer archaeologists, Tribal representatives and City bureaus reviewed milestones in the consultant work (scope of work through draft inventory report).

SITE SELECTION

Sensitivity areas cover areas considered most suitable for a given Indian use site. For instance, high-elevation, waterfront sites may have supported year-round habitation. Lower, seasonally wet locations may have supported seasonal camps and task-specific sites. The location of confirmed archaeological sites is not published in this plan to avoid disclosure of their locations. The distinction between sensitivity areas and specific archaeological resource sites is discussed later in this chapter under the heading of Adequacy of Information.

Information sources include results of archaeological investigations, consultation with tribes, and locations of historic environmental landforms. Reconstructed vegetation features are shown on Figure 8 of this report. Sensitivity areas differ in access to the Columbia River, elevation and availability of natural resources. Area 1 (Historic Lakes) represents a former inland lakes complex with direct access to the Columbia River. The Columbia River and the Columbia Slough form two distinct areas (Area 2, Rivers Edge, and Area 3, Columbia Slough). A fourth area was initially identified, Downstream Lowlands and Lakes, which represents the remainder of the plan area. Testing of the fourth area resulted in no confirmation of heritage or scientific values. As a result, the Downstream Lowlands and Lakes area will receive no further consideration in this plan. Combined, the four areas cover the entire Columbia South Shore plan area of approximately 2,800 acres.

RESOURCE FUNCTIONS AND VALUES

The object of the inventory is to establish the location, quantity and quality of resources within the planning area. These features and other notable aspects of identified resources are summarized for each site in the Site Inventory (Sensitivity Areas) section later in this chapter. To determine whether a given resource site qualifies for the City's plan inventory, several factors were considered. Each resource has certain functional values. Depending on the location, quantity and quality of the particular resource, these values may be important or they may not be important.

HERITAGE VALUES

Participating Oregon Tribes have stated that they value archaeological resource sites that reflect traditional religious practices, traditional community lifeways and unique events in tribal history. Sources of evidence for heritage values may include oral histories, ethnographic research, treaties and historic reconstruction of landforms.

Native Religious Practices. State and federal statutes govern the use and disposition of human remains, funerary objects, and sacred objects of cultural patrimony. The participating Tribes have affirmed the importance of observing these statutes to the full extent. As discussed in Chapter 6, the traditional belief is that the dead are regarded as present, and that descendants have a duty to protect their ancestors. The terms funerary objects and sacred objects of cultural patrimony are defined in the Summary and Recommendations section at the front of this report. Essentially they are objects used in ceremonies for major life changes.

Traditional Community Lifeways. Participating Tribes also value ongoing activities that have supported subsistence activities (e.g., digging roots, gathering plants for medicines, picking berries, making utensils and cooking) and spiritual activities, which give cultural identity to the group. Traditional lifeways are passed on through generations.

Treaties signed in the mid-19th century recognized that the gathering of food served both as a means of economic subsistence and the foundation of native culture. The treaties reserved aboriginal rights to assure the people's right to maintain essential elements of their way of life.

Unique to Culture. Though not mentioned as much as the two other heritage values, participating Tribes also value evidence of major events in their past.

Such evidence of major, or unique, events may include projectile points or trade items that are different from other nearby resources or native species of importance to tribal communities.

SCIENTIFIC VALUES

Archaeology can be defined as the scientific study of past human behavior from archaeological resources and the context in which they are found. It is a science that attempts to glean new knowledge from items that are unable to impart the information themselves. Qualified archaeologists use artifacts they find in or on the ground to get a sense of what life was like in the past and how peoples adapted to their environments. Some local archaeologists stated that the conventional definition should be revised to recognize that the American Indian culture survives. They advocate closer ties with the Indian community to exchange information and learn from the oral tradition.

Archaeological guidelines in use by the Oregon State Historic Preservation Office (SHPO) rate archaeological resource sites for: their potential to increase our understanding of how people adapted to and used the natural environment; their physical integrity; and relative density of archaeological materials. Other scientific values include opportunities to educate the general public and to piece together historic events through radiocarbon dating and soil layers (stratigraphy). Sources of evidence for scientific values include, but are not limited to, pedestrian surveys (also known as surface reconnaissance) and subsurface surveys.

For purposes of this Goal 5 inventory, the key scientific values to the City are the ability to add knowledge and educate the general public. Other technical factors, such as physical integrity, diagnostic material and stratigraphy, are contributing factors to knowledge and education.

Add to Knowledge. Archaeological sites may add to our knowledge base if they increase our understanding of how people adapted to and used their environments. The presence of such technical factors as physical integrity of the site, density of archaeological materials, existence of stratigraphy and presence of diagnostic material can enhance and support interpretations of archaeological materials by qualified archaeologists. The following is a description of each technical factor as it relates to archaeological resource sites.

Physical Integrity. An archaeological resource site shows physical integrity if the resource or its setting is relatively undisturbed. Sites may be disturbed by or destroyed from natural or human causes. The greater the physical integrity of a given site, the greater the interpretative value of archaeological materials.

Density of Cultural [archaeological] Materials. From a scientific standpoint, an archaeological resource site should yield enough archaeological materials within a fixed area of excavation to be cost effective. In addition, these groups of artifacts need to be within a dense enough context to show some patterns of human use. The minimum SHPO density is 100 artifacts per cubic meter of excavation.

Diagnostic Material. Resource sites may provide enough artifacts to confirm the radiocarbon dates derived from other sources, such as fauna and floral materials. Scientific value relies largely on the relation of one archaeological site or object with other archaeological sites or objects.

Presence of Stratigraphy. Resource sites have scientific value if they contain distinctive soil types and/or records of catastrophic events, such as floods or volcanic eruptions. These soils and events may be horizon markers to help date a site.

Archaeological contributions to science are vast and depend on the above mentioned factors. The Columbia South Shore has been a dynamic environment subject to many natural and cultural processes. Such ecological processes as climate change, processes of erosion, floral and fauna succession and hydrologic change are key elements in archaeological research and provide important clues to the past. Archaeological sites also provide significant data on chronology and such cultural processes as technological development, religion, trade, politics and burials. As such, archaeological sites provide significant insight to the evolution of the earth and human adaptation to the natural environment (human ecology).

Finally, archaeological sites may be used as experiments in site preservation, data recovery or sampling strategies. For these reasons, archaeological sites add knowledge to a variety of disciplines, including anthropology, history, hydrology, geomorphology, zoology, botany, forensic medicine and ecology.

Public Interpretation / Education. Archaeological resource sites are the products of social groups and provide many opportunities for public education when they are associated with each other and the surrounding environment as components of a rich history. For example, connecting archaeological resource sites through the Columbia Slough Recreational Trail could benefit tribal descendants and the greater community by providing convenient access to a wide variety of native vegetation and wildlife that was once common along the lower Columbia River.

Each identified archaeological resource site represents a unique educational opportunity for tribal descendants to impart the knowledge of important community lifeways to future generations. Tribal representatives have indicated a desire for access to cultural sensitivity areas for tribal ceremonies and training of their youth.

Other educational opportunities extend from use of the archaeological resource sites by local schools and tourists to enhance their understanding of and respect for American Indian culture, lifeways and religious ceremonies and the importance of this heritage to tribal stability. Reference to the archaeological resource sites along the Columbia Slough trail (through interpretative signs) is a useful medium for this to occur. The signs could also be used to tie Columbia South Shore to other areas along the lower Columbia River basin that experienced early contact between American Indians and Euro-Americans.

Finally, the year 2005 marks the 200th anniversary of the Lewis and Clark Expedition. The resource sites can provide a focal point for this celebration and serve to educate school children, local residents and tourists about a living culture and American Indian history.

If used as a public education tool, archaeological resource sites can help to build a dialog between area residents, businesses, American Indian peoples and tourists. This dialog can promote recognition and acceptance of differences between cultures with the goal of increasing tolerance and respect for these differences. Such cross-cultural exchange is necessary to break down stereotypes.

SUMMARY

The Columbia South Shore plan district contains locally and, in certain cases, regionally significant archaeological resources with a broad range of values. These values include three heritage values and two scientific values. Heritage values include traditional religious practices, native community lifeways, and unique events in tribal history. Scientific values relate to material remains of human life or activities that are capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation and related topics. Beneficiaries of these resource values include associated tribal communities, the archaeological community, residents and businesses throughout the Portland metropolitan area, as well as the broader scientific community.

SITE INVENTORY (SENSITIVITY AREAS)

The following section presents the inventory of three sensitivity areas within the planning area. Each sensitivity area is described in terms of resource location, quality and quantity. The inventory decisions section serves to decide the fate of each resource site: to place it on the City's inventory, to delay the Goal 5 process pending more information, or to drop it from the City's inventory. In Chapter 9,

all sites on the City's inventory will be subjected to a conflicting use analysis and considered for some level of protection.

For the inventory phase, three sensitivity areas are drawn from historic landform maps and the pattern of confirmed archaeological sites. Reconstructed landforms features are shown on Figure 8 of this report. Confirmed evidence means there is adequate information to confirm that the resource value exists in the Goal 5 resource site. Potential evidence means that the Goal 5 site contains an historic environmental setting (landforms) or other evidence that supports the resource value. For instance, relatively high ground that was located near subsistence resources may yield evidence of year-round house sites. The Sensitivity Areas Map (see Figure 10) provides a key to the location of resource sites, or sensitivity areas, discussed in this section. To further locate one's property, a Quarter Sections Map is provided (see Figure 11).

The location of confirmed archaeological sites is not published in this plan to avoid disclosure of their locations. The owners of individual properties located within designated sensitivity areas may request zoning confirmation letters which confirm that their properties do not include confirmed archaeological sites and are not designated for confirmation testing. The distinction between sensitivity areas and specific archaeological resource sites is discussed later in this chapter under the heading of Adequacy of Information.

DISCUSSION FORMAT

The inventory and analysis of resource sites in the following section summarizes material gathered during field visits as well as resource information collected from other sources as noted above. The elements of the resource site summaries and the discussion format are reviewed below.

Sensitivity Area #:	Name	Map:	Quarter section maps
Sensitivity Area Size:	Approximate acreage of sensitivity area		
Approx. Boundaries:	Approximate north, east, south and west boundaries		
Neighborhood(s):	Name of the local neighborhood(s)		
Inventory Dates:	Dates of field inventories within the resource site		

Historic Environmental Setting

Key environmental features of the landscape (landforms) as reconstructed from early land surveys and evidence from geological and archaeological records. Historic landforms for Columbia South Shore include sloughs and ponds (elevations below 15 feet), marshes and wet meadows (elevations between 15 and 20 feet), open grasslands (elevations above 20 feet), and woodlands and forests (elevations above 20 feet).

Functional Values: List of resource values, discussed earlier in this chapter.

Resource Location and Description

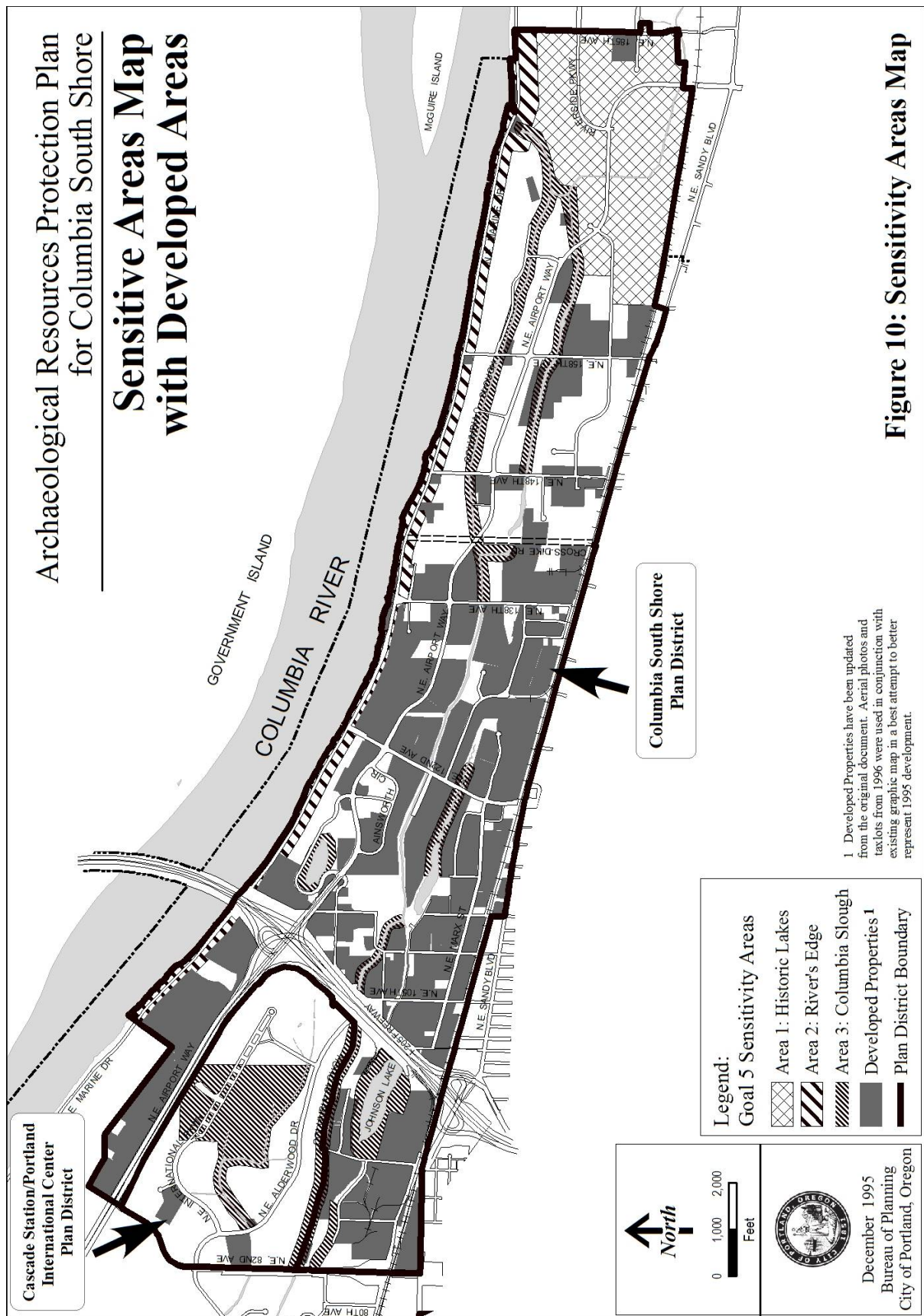
Describes the location and significant resource features of individual sites.

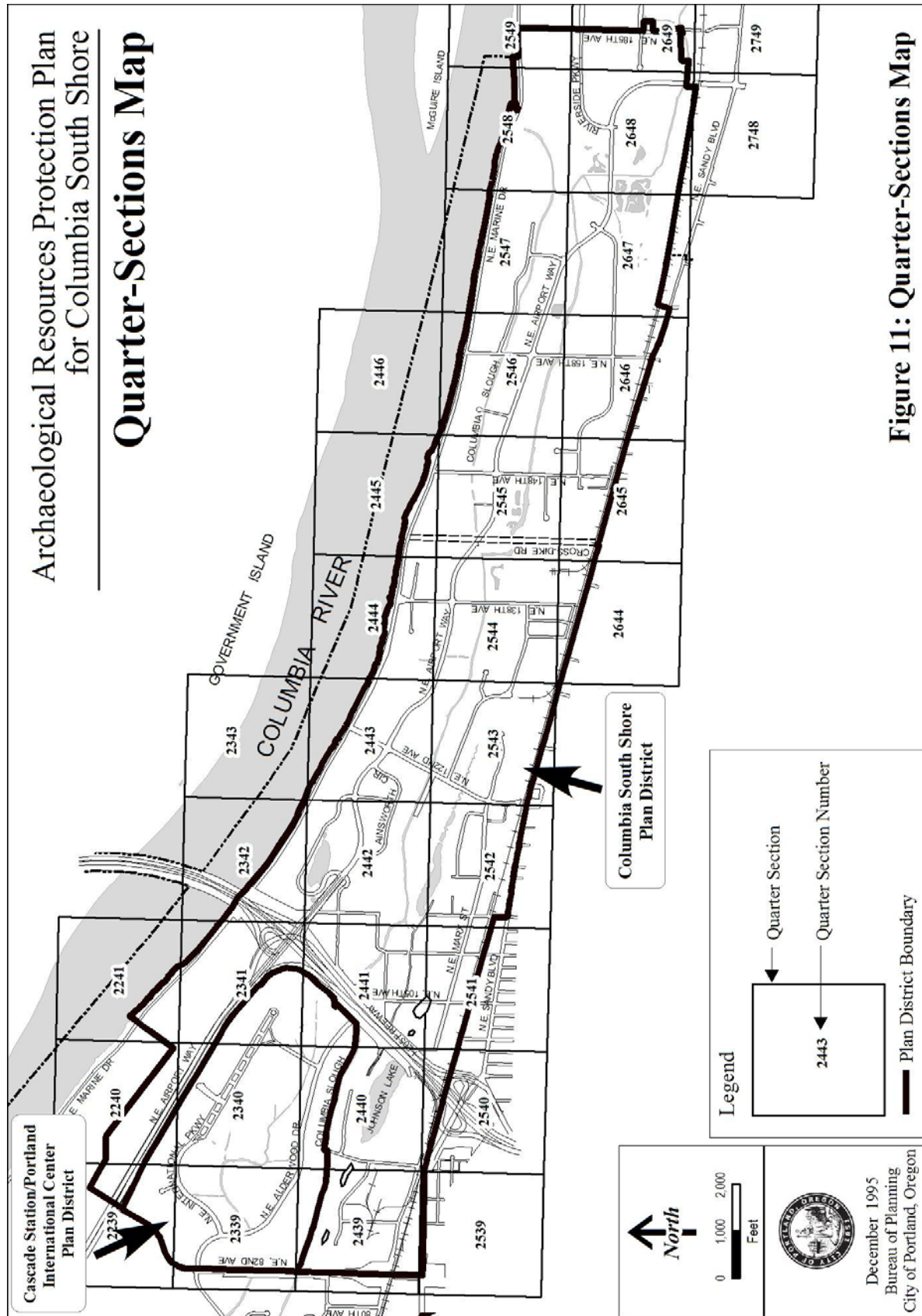
Resource Quantity and Quality

Resource quantity and quality is evaluated using information from field inventories, reconstructed environmental features, oral histories and other sources.

Conclusion

Summarizes the inventory and the significance of individual resources.





Sensitivity Area 1: Historic Lakes

Maps: 2547, 2548, 2549,
2647, 2648, 2649

Sensitivity Area Size: 336 acres

Approx. Boundaries: Either 100 feet or 550 feet south of the Marine Drive levee (measured from the toe of slope), north; NE 185th Avenue, east; Union Pacific railroad tracks, south; NE 162nd Avenue and main stem of Columbia Slough, west

Neighborhoods: Columbia Corridor Association, Wilkes

Inventory Dates: 1979, 1985, 1989, 1991, 1992, 1993, 1994, 2003

Historic Environmental Setting

Prior to 1917, this sensitivity area contained a direct slough connection to the Columbia River, two large lakes surrounded by marsh/meadow areas, and open woodlands. The lakes are known as Duck Lake and the Egg-shaped Lake. Within a short distance of relatively high, open ground (grasslands), there was a diversity of productive habitats (riverine, riparian, lacustrine/palustrine, grasslands and brush). The diversity of habitat types suggests a broad range of house-building materials (straw, bark, boards) and food sources (fish, roots, waterfowl) were available in close proximity. Watercourses (the slough system and Columbia River) connected this sensitivity area with other habitat areas downstream of the Columbia Slough and to points up and down the Columbia River.

Functional Values

The Historic Lakes retains heritage values for traditional community lifeways and native religious practices. Scientific values include site integrity, artifact density, additions to knowledge, datable material and stratigraphic information. Further archaeological research on several confirmed sites will provide opportunities to add knowledge, educate the general public on traditional practices, and provide more datable material.

Resource Location and Description

This is the eastern end of the Columbia South Shore, within the City of Portland. Across NE 185th Avenue (east) is the City of Gresham. Two other sensitivity areas (identified in this report) abut this sensitivity area. To the north is Sensitivity Area 2, River's Edge. Along the northwest boundary is Sensitivity Area 3, Columbia Slough. The northern boundary of Sensitivity Area 1 between NE 185th Avenue and the north-south section of Columbia Slough follows the current "sec" zone line.

Since 1917, the eastern slough arm has been disconnected from the Columbia River, and a number of marsh/meadow and grassland areas have been filled. Fields have been drained and filled to support agricultural crops, build the extension of NE Airport Way, and prepare buildable sites for industrial or commercial development. The Portland Office of Transportation (PDOT) built a wetland mitigation facility in a portion of the forested area north of Airport Way.

The impact area for Sensitivity Area 1 is the same as its boundary. Most of the site boundaries follow natural or manmade features that limit impacts from or to outside properties. The Columbia Slough is a natural feature which is also protected with one of the City's environmental zones. Manmade features include NE 185th Avenue (east), the Union Pacific railroad tracks (south), and property lines along the west (south of NE Airport Way).

Resource Quantity and Quality

At the beginning of the current project, the Historic Lakes contained ten recorded sites. This represents a majority of confirmed sites in the plan area. These early site recordings were based primarily on surface reconnaissance work, limited subsurface testing and historical accounts. As of 2004, five archaeological sites in the Historic Lakes are believed to meet SHPO guidelines. Those sites (by Smithsonian numbers) are: 35 MU 57, 35 MU 58, 35 MU 79, 35 MU 82, and 35 MU 84.

The 1994 areawide investigation confirmed five archaeological sites in Historic Lakes that meet SHPO guidelines. As of 2004, the number of confirmed sites remains five, with changes to two sites. First, site 35 MU 57, is no longer intact, though still recorded with SHPO. A second confirmed site (35 MU 26) is now considered non-significant. On November 25, 2003, Applied Archaeological Research issued Report No. 369. This evaluation study found the archaeological deposits "...are not significant or potentially significant and not eligible for listing in local, state or national registers."

The third previously-recorded site, 35 MU 82, received new archaeological information in late 2003. On November 12, 2003, Archaeological Investigations Northwest issued Report No. 1235. The new work involves a review of previous archaeological studies of 35 MU 82 and the placement of fourteen auger probes. The AINW report recommends changes in the boundaries. On January 10, 2004, AINW amended the recommended site boundaries, in response to comments from the SHPO's Lead Archaeologist, Dennis Griffin.

The 1994 consultant found little or no evidence of subsurface archaeological materials on four other sites recorded in earlier surveys. For lack of subsurface evidence, previously-recorded sites 35 MU 35, 35 MU 77 and 35 MU 99 were determined ineligible for listing in the National Register of Historic Places. Site 35 MU 97 was found not intact, and not considered significant.

Conclusion

Sensitivity Area 1 contains significant archaeological resources which should be included in the City's Goal 5 Inventory. Five archaeological sites have been confirmed within the site. Individually, each site is just one component of a web of interconnected activities that are tied directly to the natural environment. As such, they impart a sense of what life was like in the past and how peoples adapted to their environment. As a collective, the archaeological resources in Sensitivity Area 1 provide an overall cultural context within which to understand how the individual sites relate to one another.

Sensitivity Area 1 contains several key landform features that give it high probability for supporting traditional use practices. For example, the abundance and availability of subsistence resources exploited by American Indian peoples varied geographically and seasonally. Secondary sites (seasonal campsites) often served as extensions to villages for purposes of resource extraction and processing. Scientific and heritage resource values have been confirmed in the Historic Lakes. Based on the decision factors discussed earlier in this chapter, significant resources are located throughout Sensitivity Area 1.

Sensitivity Area 2: River's Edge

Maps: 2240, 2241, 2341,
2342, 2443, 2444, 2445, 2545, 2546,
2547, 2548, 2549

Sensitivity Area Size: 166 acres

Approx. Boundaries: Columbia River, north; NE 185th Avenue, east; 100 feet south of Marine Drive levee (measured from the toe of slope), south; NE 82nd Avenue, west

Neighborhood: Argay, Columbia Corridor Association, Cully Association of Neighbors, Parkrose Community Group, Parkrose, Wilkes

Inventory Dates: 1979, 1985, 1989, 1991, 1992, 1993, 1994, 2003

Functional Values

The River's Edge, with its immediate proximity of land to the Columbia River, retains heritage values for traditional community lifeways and native religious practices. The area provides a focal point to understand the reliance of traditional American Indian peoples on the Columbia River and Slough as sources of food, trade and mobility. Depending on the findings of archaeological resource sites encountered in the River's Edge, unique cultural practices may also be found.

Sensitivity Area 2 also supports scientific values by adding to knowledge and interpretation/education, particularly if more information becomes available about village sites. Further archaeological research, particularly on possible village sites, provide opportunities to strengthen all scientific values and may yield further heritage values.

Resource Location and Description

Sensitivity Area 2 covers the area from the ordinary high water line of Columbia River to a point either 100 feet or 550 feet south of the Marine Drive toe of slope. The wider band (550 feet) follows the existing "sec" zone line westerly from NE 185th Avenue to Pump Station #4. This wider band serves to include a recorded riverbank site and other areas near the historic mouth of the Columbia Slough at the Columbia River.

Since 1917, the Marine Drive levee has been built up to protect properties from flood events and provide east-west transportation. Several single-family houses and a new houseboat moorage are built on private properties. Northeast Marine Drive consists of two travel lanes and a grade-separated bicycle path. The bicycle path switches from a southerly alignment to the northerly alignment as one travels in an easterly direction. East of Pump Station #4, the bicycle trail is designated for the southern alignment but not built.

Indian use sites along the river shoreline will likely be deeply buried or lost by erosion. According to the geological record (see Chapter 3), the Columbia River has risen 5 meters (16.5 feet) over the last 5,000 years. Upland areas above 25 feet MSL were probably free of most flood events.

Resource Quantity and Quality

In 1990, over ten acres of the Columbia River shoreline were surveyed. The survey involved surface reconnaissance; no subsurface excavations were performed for that project. To date, the area south of Marine Drive has received approximately 65 subsurface probes.

Before 1994, two archaeological sites were recorded in the plan area:

- 35 MU 70. The 1994 investigation confirmed 35 MU 70 as a possible village site, perhaps one of the villages witnessed by Lewis and Clark.

Site 35 MU 70 is located in the wider band identified above (east of Pump Station #4). Additional investigation of this site resulted in two distinct archaeological sites: a more compact 35 MU 70 and new site 35 MU 106.

- 35 MU 78. This site is based solely on surface evidence. The site is recorded between NE 138th Avenue and the Cross-dike (approximately NE 143rd). No subsurface archaeological material was found on one property but adjacent properties were not tested.

Conclusion

Sensitivity Area 2 contains significant archaeological resources which should be included in the City's Goal 5 inventory. Historic reconstruction of the site shows that the vicinity of present-day Marine Drive was highland that may have sustained year-round villages and seasonal activity areas. Although only two archaeological resource sites have been identified, the entire River's Edge Complex provides a focal point to understand the reliance of traditional American Indian peoples on the Columbia River and Slough as sources of food, trade and mobility. For example, the Lewis and Clark journals recorded two active village sites in the vicinity of Columbia South Shore. In addition, the eastern portion of the River's Edge also offered canoe access inland from the Columbia River through the Columbia Slough and connected lakes. This is important to the extent that Sensitivity Area 2 provides significant heritage and scientific values related to clarifying the cultural and environmental context existing on the Columbia South Shore at the time of Euro-American contact. Based on the decision factors discussed earlier in this chapter, significant resources may be located throughout the sensitivity area.

Sensitivity Area 3: Columbia Slough

Maps: 2439 - 43, 2542 - 8,
 2646 - 9.

Sensitivity Area Size: 119 acres

Approx. Boundaries: Within the plan area, the stretch of the Columbia Slough and adjacent land for a distance of 100 feet from the top of bank

Neighborhood: Argay, Columbia Corridor Association, Cully Association of Neighbors, Parkrose Community Group, Parkrose, Wilkes

Inventory Dates: 1979, 1985, 1989, 1991, 1992, 1993, 1994

Functional Values

The Columbia Slough has been confirmed for datable material and heritage values for traditional community lifeways and native religious practices. In the pre-contact period, the Columbia Slough linked directly to the Columbia River. Indians may have used the slough as a canoe route between fishing, plant harvesting, other traditional use areas. Further testing along the slough holds potential to strengthen scientific and heritage values.

Resource Location and Description

The Columbia Slough courses through the plan area, with water flowing slowly in a westerly direction. There are two slough arms, generally referred to as the northern and southern arms. A drainage district operates several pumps to control the water flow. For ongoing maintenance, the drainage district is moving to a waterborne dredge system. This shift will reduce the need to mow down one bank of the slough (for land-based dredge equipment) and allow for more complete revegetation.

Resource Quantity and Quality

Before 1994, three archaeological sites were recorded along the Columbia Slough: 35 MU 30, 35 MU 80 and 35 MU 83. The site recordings were based primarily on surface reconnaissance work, limited subsurface testing and historical accounts.

The 1994 investigation found no evidence of these three sites, but recorded one new site, 35 MU 103. Most of the original site area of 35 MU 30 has been covered by over five feet of fill, thus obscuring any surface evidence. The evidence suggests that the previously-recorded sites may represent short-term task-specific activities. There is presently no evidence to suggest that they represent residential locations. The archaeological material at these locations is associated with the upper levels of the plow zone, and there appears to be no intact buried deposits.

The new slough site (35 MU 103) was a deeply buried deposit located at about 22 feet in elevation along the north edge of the Columbia Slough. It is the only subsurface site that has been discovered north of the Columbia Slough to date. This site is known only from auger probes. More extensive excavations are needed to determine the true nature and function of this locality. Initial evidence suggests that this site represents a short-term task-specific occupation.

Conclusion

Archaeological resource sites within Sensitivity Area 3 should be included in the City's Goal 5 inventory because the area represents a significant historic connection to the Columbia River and was a suitable location for task-specific sites that represent traditional Indian lifeways. In the pre-contact period, the Columbia Slough linked directly to the Columbia River. Thus, the area probably

served as a major corridor, providing a canoe route between fishing, plant harvesting and other traditional uses areas. This is important to the extent that further testing will likely increase datable materials and enhance our understanding of traditional community lifeways. Sensitivity Area 3 contains one deeply buried archaeological site (35 MU 103) that warrants further testing. The City's consultant recommends further testing along stretches of the Columbia Slough to fill in gaps in the augering pattern. More testing may clarify the scientific and heritage resource values of Sensitivity Area 3.

INVENTORY DECISIONS

The previous section identified three archaeological resource sites, or sensitivity areas, containing archaeological resources that qualify for the City's archaeological resources plan inventory. As part of this inventory, archaeological site locations were confirmed by qualified archaeologists. Confirmation testing data was used to classify each archaeological site into one of three categories: burial sites, village sites and seasonal campsites/activity areas. More specific discussion of each archaeological site types can be found in Chapter 9 of this report.

The next section gives reasons for the decision to place the resource sites within these three sensitivity areas on the City's plan inventory. The Goal 5 Administrative Rule gives cities and counties three options for the Plan inventory. First, if there is not enough information to identify the location, quality or quantity of the resource site, then the city or county commits to addressing the resource site at a specified later date. Second, resource sites may be excluded if the resource site is not important enough, or if Goal 5 standards specify that its inclusion is not required. The third option is to place the resource sites on the City's plan inventory for further analysis. Each option is discussed below.

ADEQUACY OF INFORMATION

There is no need to defer the Goal 5 process for lack of information. The Columbia South Shore has been the subject of extensive archaeological investigations and tribal consultations, which provide the location, quality and quantity of resource sites.

Location

The sensitivity areas are intentionally drawn large enough to group historic landform areas associated with certain Indian activities. The sensitivity areas make use of archaeological site information without revealing site locations. This chapter provides a description and a map. The sensitivity area boundary also

serves as the site's impact area. The Goal 5 rule recognizes that some resources are more difficult to affix boundaries to than are other resources.

The location of confirmed archaeological sites is not published in this plan to avoid disclosure of their locations. For purposes of OAR 660-16-000 (5) (c), only the nine confirmed archaeological sites and the 14 properties subject to the requirement for confirmation testing are considered to be significant "sites" included on the "plan inventory."

Other properties included within the larger sensitivity areas are not considered "sites" included on the "plan inventory" within the meaning of OAR 660-16-000 (5) (c) and are included in the sensitivity areas for purposes of the ESEE analysis only because they are included within a historic landform associated with Indian use and to avoid disclosure of the confirmed archaeological sites. The owners of individual properties located within designated sensitivity areas may request zoning confirmation letters which confirm that their properties do not include confirmed archaeological sites and are not designated for confirmation testing.

Quality and Quantity

The archaeological and Indian communities have long told the City of Portland that the Columbia South Shore has special archaeological resource value relative to other areas in the City. The district is situated along a stretch of the Columbia River basin, which is believed to have supported one of the highest densities of Indian use, given abundant and varied subsistence resources. The Columbia River served as a major trade route and fishing place. There are few undeveloped riverfront areas within the City, including the Willamette River and elsewhere in the Columbia Corridor.

According to Heritage Research Associates, the plan area is one of the most intensively surveyed areas in Oregon. To date, more than 1,000 acres of the 1,700 undeveloped acres (59 percent) have been archaeologically surveyed (by surface reconnaissance and/or subsurface probes). Between NE 138th and NE 185th Avenues, some 800 acres of 1,100 undeveloped acres (over 70 percent) have been surveyed to date. The City's 1994 inventory resulted in the survey of 425 acres (25 percent) of the 1,700 undeveloped acres in the plan area. In contrast, few areas of recorded archaeological sites in the City and region have been investigated in such a systematic manner.

Tribal consultation on this project has also been extensive. City Council formally invited the three confederated tribes to participate on a government-to-government basis. City representatives met with each Tribal Council twice, once at the outset of the project and again to discuss results of the archaeological investigation. Each Tribal government also has a representative on the project

advisory committee. Bureau of Planning staff have also consulted with Tribal representatives on development proposals in the larger Columbia Corridor. Though no new oral histories have been submitted for this project, the consultations and meetings have helped planning staff to understand better the heritage values held by associated Tribes and the local American Indian community.

Public agencies that have recently begun archaeological surveys for specific projects include the Bureau of Environmental Services (for major sewer and stormwater treatment projects further west in the Columbia Corridor) and the Port of Portland (for West Hayden Island, portions of Portland International Center and portions of Rivergate). As stated in the introduction of this report, reconnaissance surveys are already required in the Smith-Bybee Lakes complex.

Some level of uncertainty is inherent with a buried resource that retains little or no surface evidence. River-borne sediments have deposited over Indian use sites along the Columbia River floodplain, including the plan area. In addition, certain archaeological materials degrade over the years, leaving only stone objects, bones and traces of charcoal. Further, it takes special training to identify, document and evaluate archaeological materials. Therefore, the "obtainable" information for archaeological resources is less available than for most other Goal 5 resources.

A decision to defer the Goal 5 process would likely result in the destruction of archaeological resource sites, even if inadvertent. Undeveloped properties in Columbia South Shore are zoned for industrial or employment development, and public facilities are now available from NE Airport Way. The City's next opportunity to re-evaluate the Comprehensive Plan and Goal 5 inventory for the plan area is well over five years away. By then, many undeveloped properties will have built out.

A deferral would also result in less certainty for owners, developers, associated Tribes and the City. The deferred area would not be part of the current plan. Each development proposal in the deferred area would likely face more individual scrutiny by the Tribes, who favor an areawide protection plan. It can be quite costly to stop work pending investigation of archaeological materials found during project construction. City development bureaus would lack policy direction on how to design or issue permits for street, sewer and water lines. The Bureau of Planning would lack policy direction on how to make use of site and probability information gathered to date for deferred properties.

IMPORTANCE OF RESOURCE SITES

The three sensitivity areas have been evaluated for evidence of two scientific values and three heritage values (see Figure 12). Resource values are described earlier in this chapter. Evidence may either be confirmed or potential. Three sensitivity areas have scientific and heritage evidence to confirm that the resource value exists. Sensitivity Areas 1 (the Historic Lakes) and 2 (the River's Edge) have confirmed evidence for most resource values. Sensitivity Area 3 (the Columbia Slough) confirms evidence from one archaeological site. All three sensitivity areas show potential for evidence of scientific and heritage values. That is, further archaeological testing in partially-defined archaeological sites and along key landform features of unsurveyed properties will support scientific and heritage resource values.

SUMMARY

There is adequate information of sufficient importance to place the resource sites within these sensitivity areas on the Plan inventory. The remainder of this Plan will evaluate each sensitivity area and recommend implementation measures.

Figure 12: Resource Values of Goal 5 Sensitivity Areas in Columbia South Shore

Goal 5 Sensitivity Areas ¹	<u>Scientific Values</u>		<u>Heritage Values²</u>		
	Add Knowledge	Interpret / Educate	Religious Practices	Traditional Community Lifeways	Unique to Culture
Historic Lakes Complex	C ³ , P ⁴	P	C	C, P	--
River's Edge	C, P	C, P	C	C, P	P
Columbia Slough	C, P	C, P	C	C, P	--

¹ The Goal 5 inventory identifies "sensitivity areas", which represent areas of common historic environmental features. Such features were suitable to support certain Indian use activities. One or more archaeological sites may be recorded in any sensitivity area.

² This Goal 5 project represents available information and resource values of the City of Portland. It does not affect treaty, aboriginal or any other rights that Tribes may hold with the federal government or the State of Oregon.

³ "C" (confirmed) means there is adequate information to confirm that the resource value exists in the Goal 5 resource site.

⁴ "P" (potential) means the resource site contains historic landforms or other evidence that supports the resource value.

⁵ "--" means the resource site does not show signs of supporting the resource value.

CHAPTER 9: ANALYSIS OF ECONOMIC, SOCIAL, ENVIRONMENTAL AND ENERGY CONSEQUENCES OF ARCHAEOLOGICAL RESOURCE PROTECTION

Statewide Planning Goal 5 requires that a local jurisdiction protect resources found to be significant. The Goal 5 Administrative rule prescribes a three-step planning process related to protection of archaeological resources in the Columbia South Shore plan district:

1. Inventory of location, quantity and quality of Goal 5 resources;
2. Analysis of economic, social, environmental and energy (ESEE) consequences of allowing, limiting or prohibiting conflicting uses; and
3. Development of a plan to protect significant resources.

Chapter 8 identified and described three Goal 5 resource sites (also known as “archaeological sensitivity areas”) within the Columbia South Shore plan district. These archaeological sensitivity areas are deemed significant because they provide a broad range of functional values, including three heritage values and two scientific values. Heritage values include evidence of traditional religious practices, native community lifeways and unique events in tribal history, and as such, American history. Scientific values relate to material remains of human life or activities that are capable of providing an understanding of past human behavior and adaptations to the natural environment.

This chapter serves to fulfill the second requirement of the Goal 5 administrative rule, which directs local governments to analyze economic, social, environmental and energy consequences of resource protection.

Specifically, the first part of this chapter identifies uses allowed within broad zoning categories which may conflict with the three archaeological sensitivity areas identified in the Goal 5 inventory of the Columbia South Shore plan district. This involves identification of existing and potential conflicting land uses in each zone designation as well as those uses not assigned to a single zoning category. This discussion also includes an examination of ground disturbance activities associated with each identified conflicting use.

Next, the chapter provides a detailed analysis of the economic, social, environmental and energy consequences of permitting, limiting or prohibiting conflicting uses. Impacts on both the resource by conflicting uses, and conflicting uses by the resource, are considered and resolved. The chapter concludes with a discussion of recommendations for each of the four ESEE factors considered, including the level of resource protection needed for each archaeological sensitivity area.

The analysis and recommendations addressed in this chapter are intended to meet Goal 5 requirements to protect significant resources. Protection measures in Chapter 10 derive from a resolution of the conflicts between uses as identified in the detailed ESEE analysis.

CONFLICTING USES

According to the Goal 5 rule, a conflicting use is one that, if allowed, could negatively impact a significant resource site. Such uses are permitted in the City base zones as allowed uses, conditional uses or uses subject to limitations. If these uses actually occurred at the intensities and during the times allowed by existing City land use regulations, they could diminish or destroy identified cultural resource values in the Columbia South Shore.

Archaeological sites of the period prior to European contact are difficult to identify. Examples of archaeological sites include shipwrecks, lithic quarries, house pit villages, camps, burials, lithic scatters, homesteads and town sites. First, unlike most scenic and natural resource sites, archaeological sites are typically not visible from the surface. Sites may be buried beneath several centimeters to several meters of alluvial silts and sands produced by past flood events. Other sites may consist of easily found surface-level archaeological objects that provide evidence of task-specific activities conducted at the site (e.g., lithic scatters, tools, pottery). For purposes of this ESEE analysis, three archaeological site types are recognized in the Columbia South Shore plan district-- burial sites, village sites and seasonal campsites/activity areas. Each classification is discussed in greater detail later in this chapter.

Second, the untrained eye might not recognize and identify the type of archaeological site from remnant artifacts that have not decomposed over the years. Typical clues for an archaeological site include a band of charcoal, flakes from the making of stone tools, animal bones, nuts and fire cracked rock. A qualified archaeologist is trained to locate, identify and interpret these archaeological materials.

Thus, given the locational position of each archaeological sensitivity area (e.g., surface or subsurface), their resource values could be negatively impacted by ground disturbance activities. For example, some archaeological sites may first be discovered during excavation activities related to building construction or other ground disturbance activities, such as farming or landscape installation. To address this issue, conflicting land uses will be described in terms of their associated ground disturbance activities.

CONFLICTING USES PERMITTED BY ZONING

The Goal 5 administrative rule directs local governments to examine uses allowed within broad zoning categories (e.g., industrial, employment). An examination of current zoning code for the Columbia South Shore plan district reveals the following broad zoning categories: general industrial (IG2), general employment (EG2), residential farm and forest (RF) and open space (OS).

The majority of the Columbia South Shore plan district is zoned for general industrial use, IG2. Small areas along the waterfront are zoned OS or RF. The remainder of the plan district is zoned for general employment, which allows light industrial, commercial and institutional uses. This suggests that activities associated with commercial and industrial uses are most likely to occur within the Columbia South Shore plan district.

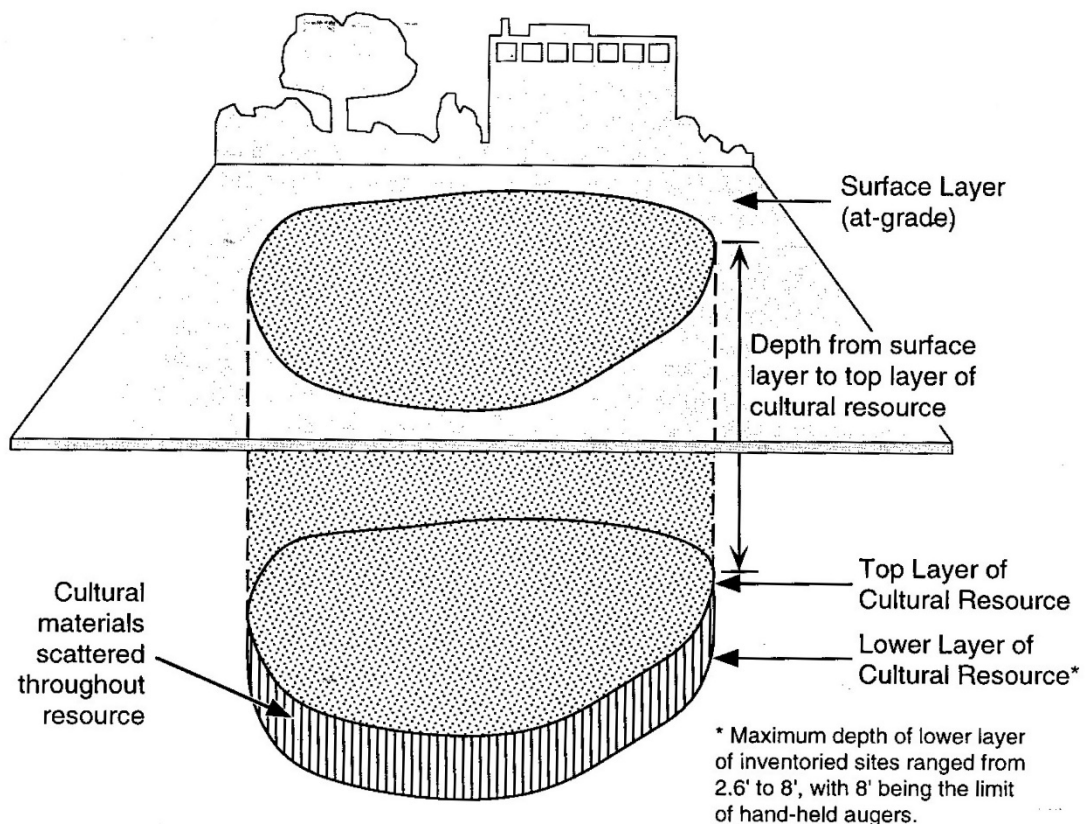
Uses allowed in the broad zoning categories conflict with some or all of the inventoried archaeological resource sites in the Columbia South Shore, due to excavation, compaction and chemical degradation activities associated with allowed uses. For purposes of this analysis, the term “ground disturbance activities” represents all three resource impact activities. Conflicting uses vary in degree of impact to a particular archaeological resource site. That is, the degree of impact of a conflicting use varies by the contents of and proximity to archaeological resource sites.

First, some archaeological resource sites are more fragile than others. Remnant wood planks to a house structure are easily crushed and decompose at a faster rate if exposed and removed from a sterile environment or if certain chemicals are released and migrate to the resource site. A band of charcoal with fragments of bones and stone tools would be much more difficult to record and interpret if components of that resource site are dug up, compacted or impacted by certain chemicals. Other resource sites, such as a firepit associated with a seasonal campsite, might be limited to fire cracked rock and stone tool flakes which are less fragile.

Second, the physical proximity of ground disturbance activities to an archaeological resource site has horizontal and vertical coordinates. Figure 13 depicts the three-dimensional element of archaeological resource sites. Both coordinates are important. In relative terms, an archaeological resource site is more vulnerable to the vertical proximity of a conflicting use than to that use’s horizontal proximity. Soil compaction from the construction and use of buildings and roads exerts a vertical force that can alter the juxtaposition of archaeological materials. The release of chemicals will also tend to migrate vertically, although local hydrologic conditions may also allow chemicals to

migrate horizontally. Construction above an archaeological resource site may also deter or prevent access to a site at a later date by a qualified archaeologist or tribal representative.

Figure 13: Sample Archaeological Resource



It appears that the “capping” of an archaeological resource site (that is, constructing an impervious material several feet above the resource site, such as a building foundation, a parking lot or a road) offers limited resource protection. Given a choice between excavating the resource site (for a building) and leaving the resource site alone and building a parking lot above it, the latter “capping” choice may protect scientific and heritage values more fully. Qualified archaeologists and tribal government representatives are best able to evaluate and recommend an effective “capping” program that protects these resource values.

A properly designed capping program would limit its impact by keeping out chemical contaminants and placing clear, yet confidential instructions that future developers of the development site would first conduct a Level 2 archaeological investigation of the resource site. To ensure a thorough investigation and to comply with state law, the future applicant should follow SHPO permitting and reporting procedures. Conservation easements recorded with the deed offer a discrete legal mechanism to implement a “capping” program.

Archaeological investigations to date in the plan area have identified archaeological sites at a maximum site depth of between 80 cm and 250 cm (2.6 feet and 8.2 feet). Eight feet in depth is the limit of hand-held augers. Archaeologists speculate that archaeological remains as much as 6,000 years old could potentially be found more deeply buried in this area. However, such evidence is likely to be buried beyond the reach of Level I archaeological discovery techniques, possibly lying as deep as 10-30 meters (33 to 99 feet) below the present surface. This is significant to the extent that protection measures identified for archaeological resource sites will be based on relative ground disturbance impacts of each identified conflicting use and the contents of and proximity to the archaeological resource site.

Figure 14 illustrates a depth comparison between archaeological methods and typical ground disturbance activities in the Columbia South Shore plan district. This diagram is useful for gauging impacts to identified archaeological sensitivity areas based on the relative ground disturbance depth of a given conflicting use. Depths identified in the diagram assume no site clearance, and should be considered minimums. Furthermore, this diagram does not depict all conflicting uses identified in the Columbia South Shore. Rather, the diagram is intended merely to illustrate a range of ground disturbance activities that can be compared to the range of depths for identified archaeological sensitivity areas.

Examples of ground disturbance activities range in depth from a relatively shallow recreational trail to a sanitary sewer line. A soft surface recreational trail might involve an eight-foot wide excavation to a depth of six inches. Placement of a sanitary sewer line involves significant excavation to a depth of ten feet.

Figure 15 lists the uses permitted under the base zones present in the Columbia South Shore plan district which conflict with the archaeological sensitivity areas identified in the Goal 5 inventory. Figure 15 is useful in terms of predicting the types of uses most likely to occur within the Columbia South Shore plan district. The darker colored bands highlight those uses that are allowed outright in both IG2 and EG2 zones. The lighter colored bands highlight those uses that are allowed outright in EG2 zones, but only on a limited basis or as a conditional use in IG2 zones.

More detailed descriptions of each general use category follow Figures 14 and 15.

Figure 14: Depths Comparison Between Archaeological Methods and Typical Ground Disturbance Activities in the Columbia South Shore Plan District

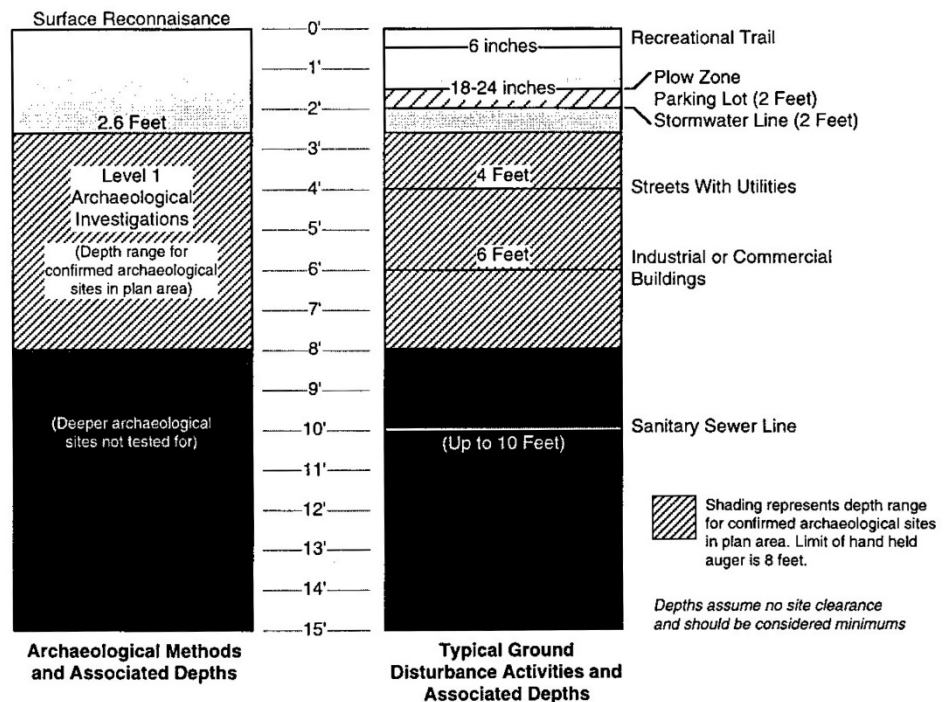




Figure 15: Conflicting Uses Permitted by Zoning in the Columbia South Shore Plan District (With Emphasis On Those Uses Allowed In Both IG2 and EG2 Zones)

Use Categories	EG2	IG2	IG2 in IBO subdistrict	RF	OS
Residential Categories					
Household Living	CU	CU	CU	Y	N
Group Living	CU	N	N	CU	N
Commercial Categories					
Retail Sales and Service	L [2]	L/CU	L/CU	N	CU
Office	L [2]	L/CU	L/CU	N	N
Quick Vehicle Servicing	Y	Y	Y	N	N
Vehicle Repair	Y	Y	Y	N	N
Commercial Parking	Y	CU	CU	N	N
Self-Service Storage	Y	Y	Y	N	N
Commercial Outdoor Recreation	Y	CU	CU	N	CU
Major Event Entertainment	CU	CU	CU	N	N
Industrial Categories					
Manufacturing and Production	Y	Y	Y	N	N
Warehouse and Freight Movement	Y	Y	Y	N	N
Wholesale Sales	Y	Y	Y	N	N
Industrial Service	Y	Y	Y	N	N
Railroad Yards	N	Y	Y	N	N
Waste-Related	N	L/CU	L/CU	N	N
Institutional Categories					
Basic Utilities	Y/CU	Y/CU	Y/CU	CU	CU
Community Service	Y	L/CU	L/CU	CU	CU
Essential Service Providers	L	N	N	N	N
Parks and Open Areas	Y	Y	Y	L/CU	L/CU
Schools	Y	N	N	CU	CU
Colleges	Y	N	N	CU	N
Medical Centers	Y	N	N	CU	N
Religious Institutions	Y	N	N	CU	N
Daycare	Y	L/CU	L/CU	L/CU	CU
Other Categories					
Agriculture	Y	Y	Y	Y	Y
Aviation and Surface Passenger Terminals	CU	CU	CU	CU	N
Detention Facilities	CU	CU	CU	N	N
Mining	N	CU	CU	CU	CU
Radio and TV Broadcast Facilities	L/CU	L/CU	L/CU	L/CU	L/CU
Rail Lines and Utility Corridors	Y	Y	Y	CU	CU

Note: This figure does not identify all prohibited uses in the Columbia South Shore plan district. See page 5 for textual description of Figure 14.

LEGEND

 = IG2 and EG2
 = EG2 and limited IG2
 Y= Yes, Allowed
 N= No, Prohibited
 CU = Conditional Use Review Required
 L= Allowed, but special limitations apply

The following discussion will describe potential and existing uses allowed under the broad zone categories as well as uses not assigned to a single zoning category. Each description also identifies the primary ground disturbance activities associated with each type of use.

Industrial Uses

Industrial uses are allowed outright on land zoned IG2, General Industrial 2, and EG2, General Employment.

The Columbia South Shore plan district is the type of developing area intended for EG2 and IG2 development standards. The plan district has no EG1 or IG1 zoning, which is intended for built-up areas on a smaller grid block pattern. Rather, IG2 and EG2 areas generally have larger lots and an irregular or large block pattern. The area is less developed, with development sites having medium and low building coverages and buildings which are generally set back from the street.

Maximum building coverage for an industrial use in IG2 and EG2 zones is 85 percent of the development site and there is a minimum required landscaped area of 15 percent. One third of landscaped areas may be covered with walkways and other impervious surfaces. Subject to environmental zone limitations, up to 100 percent of a development site may experience ground disturbance activities (buildings, exterior development, utilities, landscaping and water quality facilities). These ground disturbance activities pose potentially severe consequences to any archaeological resources located on the development site. The conditions and limitations usually imposed on commercial uses in the IG2 zone do not apply to industrial uses. Therefore, full coverage of a development site is more likely for industrial uses. This is significant because, as stated before, the predominant activities to occur in the Columbia South Shore plan district will likely be related to industrial development.

Industrial development is typically single-story, with land-extensive exterior development. When development sites are filled or leveled, large areas are paved or covered with buildings, and existing landscaping is reduced. At full buildout, industrial developments typically cover 80 to 90 percent of a development site with impervious surface materials. Industrial buildings typically consist of tilt-up concrete walls, flat roofs and rooftop equipment projecting from rooftops. Exterior development includes exterior storage (usually fenced in with open chain link fences), exterior work activity areas and vehicle circulation areas, parking lots, loading areas, driveways and aisles. Exterior storage items include raw or finished goods, salvage goods and inoperable vehicles. Exterior work activities include the outdoor processing,

assembly or fabrication of goods and the repair of salvaged vehicles and equipment.

Industrial uses allowed in the IG2 and EG2 zones are identical, except for some limitations in the EG2 zone. Industrial uses allowed in both zones include manufacturing and production, warehouse and freight movement, wholesale sales and industrial services. Railroad yards are allowed outright only in IG2 zoned sites. Waste-related activities are allowed with limitations only in the IG2 zone if approved through the conditional use review process.

The plan district includes land zoned as the industrial business opportunity (IBO) subdistrict. The purpose of the IG2-IBO subdistrict is to allow certain industrially-oriented office uses if there is excess capacity in the transportation system and there is an industrial component to the proposed use. These uses are intended to contribute a higher level of employment and pedestrian activity compatible with the industrial district. Uses allowed if approved through a Type II conditional use review are: research and development; data processing; operation centers for industrial and business uses; and other similar uses. Within the IBO subdistrict, sites zoned IG2 are allowed a single retail sales and service use of up to 12,000 square feet without a conditional use review.

Specific Conflicts Associated with Ground Disturbance Activities Related to Industrial Uses

Conflicting Use	Ground Disturbance
Building Construction	Excavation, fill and grading activities
Road Building	Grading activities
Landscaping	Subsurface irrigation and surface planting
Vehicle Circulation Areas (including parking lots)	Grading, soil compaction and capping of site
Chemicals	Runoff from exterior storage areas (degrading to archaeological resource site) Petroleum storage tanks (for fleet vehicles) Roadway spills
Utility Line Extension	Excavation activities

Commercial Uses

Commercial development and activity is allowed throughout the Columbia South Shore to some degree. Its greatest concentrations will occur on sites zoned EG2 (general employment). Employment-zoned sites are located at the intersection of I-205 and NE Airport Way, the Port of Portland property west of I-205, and at the eastern end of the Columbia South Shore where NE Airport Way curves southward to intersect with I-84. These sites are located strategically at points of entry into the Columbia South Shore plan district.

Commercial uses allowed in the Columbia South Shore plan district include quick vehicle servicing, vehicle repair, self-service storage, retail sales and service and office. Commercial parking and outdoor recreation uses are allowed outright on sites zoned EG2, and as conditional uses on sites zoned IG2.

Activities associated with commercial development which are detrimental to archaeological resources are generally the same as for industrial development, although commercial developments typically have fewer outdoor activities, such as storage and assembly. Maximum building and impervious surfaces coverages are similar to those described for industrial uses.

Specific Conflicts Associated with Ground Disturbance Activities Related to Commercial Uses

Conflicting Use	Ground Disturbance
Building Construction	Excavation, fill and grading activities
Road Building	Grading activities
Landscaping	Subsurface irrigation and surface planting
Vehicle Circulation Areas (including parking lots)	Grading, soil compaction and capping of site
Chemicals	Runoff from exterior storage areas (degrading to archaeological resource site) Petroleum storage tanks (for fleet vehicles) Roadway spills
Utility Line Extension	Excavation activities

Residential Uses

The plan district includes land zoned RF, Residential Farm and Forest. The RF zone is generally applied to lands suitable for agriculture and forestry, but also

allows residential uses. The RF zone allows single family development (on 2-acre minimum lot size). Household living uses are also allowed on development sites zoned IG2 and EG2. These uses include houseboat moorages through a conditional use review.

Group living uses are allowed on development sites zoned RF and EG2, if approved through the conditional use review process. Temporary uses allowed in RF zones consist of mobile homes (during construction); residential sales offices; shows of model homes; and temporary activities and structures for natural disasters and emergencies.

Several single-family residences exist along the Columbia River near NE 122nd Avenue and one houseboat moorage is located along the river near NE 185th Avenue. An opportunity exists for one additional houseboat moorage in the plan district, along Marine Drive. The potential impact of this development on archaeological resource sites comes from its associated parking lot and walkways that lead to the moorage site. The actually moorage site would be located on pilings in the Columbia River, and as such do not represent a conflict with archaeological resource sites. For purposes of this ESEE analysis, only the impact of associated parking lots and walkways will receive consideration as a conflicting use within the residential uses category.

Specific Conflicts Associated with Ground Disturbance Activities Related to Residential Uses

Conflicting Use	Ground Disturbance
Building Construction	Excavation, fill and grading activities
Road Building	Grading activities
Landscaping	Subsurface irrigation and surface planting
Vehicle Circulation Areas (driveways)	Grading, soil compaction and capping of site
Chemicals	Runoff from lawns, gardens, etc. (degrading to archaeological resource site)
Utility Line Extension	Excavation activities

Open Space

The plan district includes land zoned OS, Open Space, primarily located along the waterfront. The purpose of the OS zone is to preserve public and private open and natural areas identified in the Comprehensive Plan. Agriculture and parks and open areas are the only uses allowed by right in the OS zone. Certain

facilities associated with a Parks and Open Areas use require a conditional use review (e.g., boat ramps and concession uses). Temporary uses permitted in the OS zone are: fairs, carnivals, and other special events, temporary activities and structures needed for natural disasters and emergencies, and staging areas for public utility installation. The Columbia Slough Trail represents the only identified conflicting use currently in the OS zone within the Columbia South Shore plan district. The trail will be the focus of this ESEE analysis with regard to open space impacts on archaeological resource sites.

Specific Conflicts Associated with Ground Disturbance Activities in OS Zone

Conflicting Use	Ground Disturbance
Recreational Trail Construction	• Grading to a depth of eight to twelve inches
Landscaping	• Surface planting

Agricultural Uses

Agriculture is allowed in the open space and industrial zones. Most farming takes place in the eastern portion of the plan district. Adverse impacts on archaeological resource sites can occur from agricultural operations which include clearing of vegetation, plowing of fields, exposing bare soils and application of pesticides, herbicides and fertilizers. The plow zone is assumed to be between 18-24 inches in depth and may impact archaeological resource sites on a given development site. Most development sites in the plan area have been farmed extensively, and this activity continues in the eastern portion of the plan district. Some archaeological materials within the plow zone are tilled and displaced, while other archaeological materials have been removed to private collections.

Specific Conflicts Associated with Ground Disturbance Activities Related to Agricultural Uses

Conflicting Use	Ground Disturbance
Cultivation	• Surface planting and subsurface irrigation system
Tilling/Plowing	• Displacement of soil
Chemical Application	• Runoff (degrading to archaeological resource site)

Mining

Mining is a conditional use in IG2, RF and OS zones. It is prohibited in the EG2 zone. There are no existing or planned mining activities in the plan district at this time. Potential for mineral and aggregate activities inside the Columbia South Shore plan district is low due to two conflicting uses identified in the *Mineral and Aggregate Resources Inventory* (August 1988). First, ground water is protected in the plan district because it provides some of the City's well water supply, and mining would not be allowed in the immediate area. Second, land values, especially with sewer and highway improvements now underway, will predicate a higher industrial use for the property in the plan district. As such, mining will receive no further consideration in this ESEE analysis.

Specific Conflicts Associated with Ground Disturbance Activities Related to Mining Activities

Conflicting Use	Ground Disturbance
Mineral Extraction	<ul style="list-style-type: none">• Excavation activities• Shifting or removal of soils

Basic Utilities/Infrastructure

Basic utilities are infrastructure services that need to be located in or near the area where the service is provided. Examples of basic utilities include sewer and water lines, gas lines, storm water detention and retention areas, monitoring wells and pump stations. All utility examples exist in the plan district; most have been placed underground. The potential impact of utilities on archaeological resources in the Columbia South Shore plan district is relatively high due to the ground disturbance activities associated with burying utilities in the ground.

As development advances throughout the Columbia South Shore plan district, activities related to provision of infrastructure will also occur. At present, two confirmed archaeological resource sites would be impacted by planned secondary roads identified in the Airport Way Secondary Infrastructure Plan (SIP). The Bureau of Planning has coordinated with Portland Department of Transportation (PDOT) staff to share this information with the Tribal Councils of three Oregon tribes (Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of Warm Springs and Confederated Tribes of the Siletz) and the State Historic Preservation Office (SHPO).

Conflicts Associated with Ground Disturbance Activities Related to Basic Utilities Uses

Conflicting Use	Ground Disturbance
Road Building	• Grading activities
Utility Line Extension	• Excavation activities

Rail Lines and Utility Corridors

Rail lines and utility corridors are allowed outright in IG2 and EG2 zoned sites and as conditional uses in OS and RF zoned lands. Rail lines include rail spurs that serve individual development sites. Their effects are the same as basic utilities, except that construction of rail lines often requires substantial excavation and fill to meet 0-3 percent slope standards. Utility corridors include public or private passageways for purposes of transmitting or transporting electricity, gas, oil, water, sewage, communication signals or other similar services on a regional level. A proposal exists to build a pipeline to transport storm water from a storm water detention facility near NE 122nd Avenue to a sewage treatment facility for treatment. This conflicting use would pose significant ground disturbance impacts to any archaeological resource site located in its path due to excavation required for pipe placement.

Specific Conflicts Associated with Ground Disturbance Activities Related to Rail Lines and Utility Corridors

Conflicting Use	Ground Disturbance
Rail Line Construction	• Excavation, fill and grading activities
Vehicle Circulation Areas (service roads)	• Grading, soil compaction and capping of site
Chemicals	• Runoff from vegetation control measures (degrading to archaeological resource site)
Utility Line Extension	• Excavation activities

Detention Facilities

Detention facilities are facilities for the judicially required detention or incarceration of people. Examples include prisons, jails, probation centers and juvenile detention homes. Accessory uses include offices, recreational and health facilities, and maintenance facilities. Detention facilities are allowed throughout the Columbia South Shore as conditional uses. One such facility exists in the

plan district and the effect of this facility on archaeological resource sites is the same as commercial uses.

Specific Conflicts Associated with Ground Disturbance Activities Related to Detention Facilities

Conflicting Use	Ground Disturbance
Building Construction	• Excavation, fill and grading activities
Road Building	• Grading activities
Landscaping	• Subsurface irrigation and surface planting
Vehicle Circulation Areas (including parking lots)	• Grading, soil compaction and capping of site
Chemicals	• Runoff from exterior storage areas (degrading to archaeological resource site) • Roadway spills
Utility Line Extension	• Excavation activities

Radio and Television Broadcast Facilities

Radio and television broadcast facilities are comprised of devices, equipment, machinery, structures and other supporting elements necessary to produce a signal or message within the range of frequencies from 100 KHz to 300 GHz. Examples of such facilities include broadcast towers, communication towers and point to point microwave towers. Towers may be self-supporting, guyed or mounted on poles or existing buildings. Most low-powered transmitters such as cordless telephones and citizen band radios are allowed in all zones. Other radio and television broadcast facilities are allowed outright throughout the Columbia South Shore plan district.

Specific Conflicts Associated with Ground Disturbance Activities Related to Radio and Television Broadcast Facilities

Conflicting Use	Ground Disturbance
Tower Construction	• Excavation, fill and grading activities
Vehicle Circulation Areas (service roads)	• Grading, soil compaction and capping of site
Chemicals	• Runoff from vegetation control measures (degrading to archaeological resource site)

Utility Line Extension	• Excavation activities
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Institutional Uses

Institutional uses are limited or prohibited in most zones except commercial zones. In the EG2 zone, institutional uses are allowed outright. The City Zoning Code has nine different categories of institutional uses, including parks and open areas, basic utilities, schools and colleges, medical centers and daycare. Ground disturbance activities associated with institutional uses are similar to those associated with commercial uses. For purposes of this ESEE analysis, impacts of commercial and institutional uses will be grouped together when considered a conflicting use.

Specific Conflicts Associated with Ground Disturbance Activities Related to Institutional Uses

Conflicting Use	Ground Disturbance
Building Construction	• Excavation, fill and grading activities
Road Building	• Grading activities
Landscaping	• Subsurface irrigation and surface planting
Vehicle Circulation Areas (including parking lots)	• Grading, soil compaction and capping of site
Chemicals	• Runoff from exterior storage areas (degrading to archaeological resource site) • Petroleum storage tanks (for fleet vehicles) • Roadway spills
Utility Line Extension	• Excavation activities

The previous section reviewed existing and potential conflicting uses allowed by City base zones. These uses generally fall into one of the following categories:

- commercial and institutional uses;
- industrial uses;
- residential uses;
- open space uses; and
- other uses such as agriculture, detention facilities, radio and television broadcast facilities.

Predicting Future Conflicting Uses

As of Spring 1994, the Columbia South Shore plan district held an estimated 1700 acres (60 percent) of vacant land. The evolution of the Columbia South Shore, from farm uses to industrial uses, is readily apparent to the casual observer. Over the last century, agricultural, urban and industrial developments have

altered the natural state of the plan district. The most likely conflicting uses to occur in the future in the Columbia South Shore plan district are industrially-related warehouse and freight movement activities. This assumption is based on three sources of information.

First, the Portland Development Commission (PDC) is developing a marketing plan for the Airport Way sector of the eastern portion of the Columbia South Shore plan district. The marketing plan is focused on such target industries as food processing operations, electronic manufacturers, regional service/distribution and manufacturing. In addition, North/Northeast Portland has been considered the region's top "hot spot" for the manufacturing and distribution markets. The PDC estimates over 300,000 square feet of new speculative manufacturing, service and warehouse/distribution space in the Airport Way sector in the near future. The PDC also reports that a 90,000 square foot speculative office building in Portland International Center, near 82nd Avenue and NE Airport Way, is now 60 percent pre-leased. The office building is located in the Columbia South Shore plan district near its western boundary.

Second, in conjunction with their marketing effort, the PDC completed a report, *Airport Way Secondary Infrastructure Plan* (SIP), in March 1995. The report catalogs existing and proposed infrastructure for the eastern 900 acres of the Columbia South Shore plan district. The SIP study area is located east of NE 138th Avenue, within the Columbia South Shore plan district.

The SIP report provides a development scenario for the eastern portion of the plan district, identifying 607 acres of developable land zoned for industrial or general employment uses. Primary infrastructure within the Columbia South Shore plan district, including the extension of NE Airport Way and sewer and water mains beneath the roadway, is complete. However, this infrastructure is inadequate to support all planned development in the Columbia South Shore. To address this issue, the SIP provides a phased plan for the provision of secondary infrastructure roads and related utilities needed to fully develop the eastern portion of the Columbia South Shore. The phase period extends from 1993 through 2015.

Of special note is the fact that the "development scenario" may deviate from the timeline given. Some development sites may be developed sooner than expected, while others may develop later than anticipated. The SIP is meant to serve as a guide rather than a prescription of when and where development should occur. The SIP identifies the most efficient locations for future streets, water and sewer lines and other utilities in the eastern part of the plan district. This plan may accelerate the pace of industrial development and associated impacts on archaeological resource sites throughout the plan district.

Finally, current zoning and ground disturbance activities associated with existing conflicting uses identified in the Columbia South Shore can also serve as a gauge for determining the extent and type of ground disturbance that is likely to occur in the future (see Figure 15).

Figure 16 summarizes existing uses in the plan district and the predominant activities associated with those uses that could pose the most impact on identified archaeological sensitivity areas. This figure is based on development standards related to permitted uses, projections of industrial-related growth by the Portland Development Commission and the Port of Portland and likely ground disturbance activities that would occur as a result of a use.

Figure 16: Summary of Most Likely Conflicting Uses in the Columbia South Shore Plan District and Ground Disturbance Activities Associated with Each Use

Major Land Use Categories	Predominant Activities Associated with Uses That Could Impact Archaeological Resources	Typical On-Site Disturbance at Full Buildout (% of site)	Typical Depth of Site Disturbance ¹
Industrial	Excavation, fill, grading, landscaping, soil compaction, petroleum storage tanks, roadway spills and site runoff	Building (35%) Parking Lot (40%) Landscaping (15%) Storage Tanks (<1%) Vehicle Circulation (<10%)	6 feet 2 feet 18-24 inches 4 feet
Commercial and Institutional	Excavation, fill, grading, landscaping, soil compaction, petroleum storage tanks, roadway spills and site runoff	Building (35%) Parking Lot (40%) Landscaping (15%) Vehicle Circulation (<10%)	6 feet 2 feet 18-24 inches 4 feet
Residential	Parking lots and walkways ²	Parking lot (40%) Landscaping (15%) Walkways (10%)	2 feet 18-24 inches 8 -12 inches
Open Space	Trail construction, grading, soil compaction and landscaping	Recreational Trail (<1%)	8-12 inches
Agriculture	Cultivation, tilling, plowing, and chemical application	Crops (up to 100%)	18 - 24 inches
Radio & TV Broadcast Facilities	Excavation, fill, grading, landscaping, soil compaction, and chemical application runoff	Tower (<20%) Service Roads (<5%)	10 feet 2 feet
Rail Lines & Utility Corridors	Excavation, fill, grading, landscaping, soil compaction, and chemical application runoff	Rail lines and spurs (<5%)	6 feet
Basic Utilities	Excavation, fill, grading, and soil compaction	Sanitary sewer line (<1%) Storm water line (<1%) Water and gas lines (<1%)	Up to 10 feet 2 feet 2 feet

¹ Depths assume no site clearance and should be considered minimums.

² Houeboats are the residential structures associated with this use. Moorages are built on pilings located in the water and, therefore, do not impact archaeological resource sites.

THE ESEE PROCESS

As stated earlier, Statewide Planning Goal 5 requires that local jurisdictions protect resources found to be significant. After resources have been inventoried and conflicting uses identified, a jurisdiction is required by Statewide Planning Goal 5 and its administrative rule (OAR) to analyze the economic, social, environmental and energy consequences of resource protection. If there are no conflicting uses for an identified resource, OAR requires the jurisdiction to adopt policies and regulations ensuring preservation of the resource. Where conflicting uses are identified, the economic, social, environmental and energy consequences must be determined.

The previous section identified conflicting uses allowed by current zoning within the Columbia South Shore plan district. The discussion also included an examination of ground disturbance activities associated with each identified conflicting use. In the Columbia South Shore plan district, all identified archaeological resource sites have conflicting uses, and are subject to the ESEE analysis. Impacts on both the resource by conflicting uses, and conflicting uses by the resource must be considered and resolved. Other applicable Statewide Planning Goals are also considered in the discussion of impacts.

Oregon Administrative Rules lay out the steps to be followed in complying with Goal 5, but provides flexibility in determining what factors should be considered as having potential economic, social, environmental and energy consequences. This flexibility is important because relevant ESEE factors vary greatly, depending on the content and location of the archaeological resource being evaluated and potential conflicting uses that are allowed.

To this end, the following section discusses the consequences of permitting, limiting or prohibiting uses in the three archaeological sensitivity areas identified in the Columbia South Shore Goal 5 archaeological resources inventory (see Chapter 8).

GENERAL ESEE CONSEQUENCES OF PERMITTING, LIMITING OR PROHIBITING CONFLICTING USES

This section analyzes the consequences of prohibiting, limiting or permitting conflicting uses identified within three inventoried archaeological sensitivity areas located in the Columbia South Shore plan district. The analysis addresses four types of consequences: economic, social, environmental and energy.

First, the analysis considers consequences common to all inventoried sites, both to the resource and to existing or potential land uses throughout the Columbia South Shore plan district. Second, the analysis considers the ESEE consequences of the three sensitivity areas identified in the Goal 5 archaeological resources inventory (Chapter 8). The combination of these general and site-specific consequences is used to resolve conflicting uses and to arrive at conclusions regarding the level of resource protection needed for each identified archaeological sensitivity area, and the Columbia South Shore as a whole. For purposes of this ESEE analysis, the various levels of archaeological resource protection are defined as follows:

- **Full protection** means 1) completing archaeological "confirmation testing" for that development site, 2) no ground disturbance of confirmed archaeological sites, and 3) some level of protection for adjacent transition areas.
- **Partial protection** means 1) completing archaeological "confirmation testing" for that development site, 2) partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and 3) some level of protection for adjacent transition areas.
- **No protection** means 1) no further archaeological testing for that development site through State Goal 5, 2) no special restrictions on ground disturbance activities, and 3) no special restrictions on adjacent transition areas.

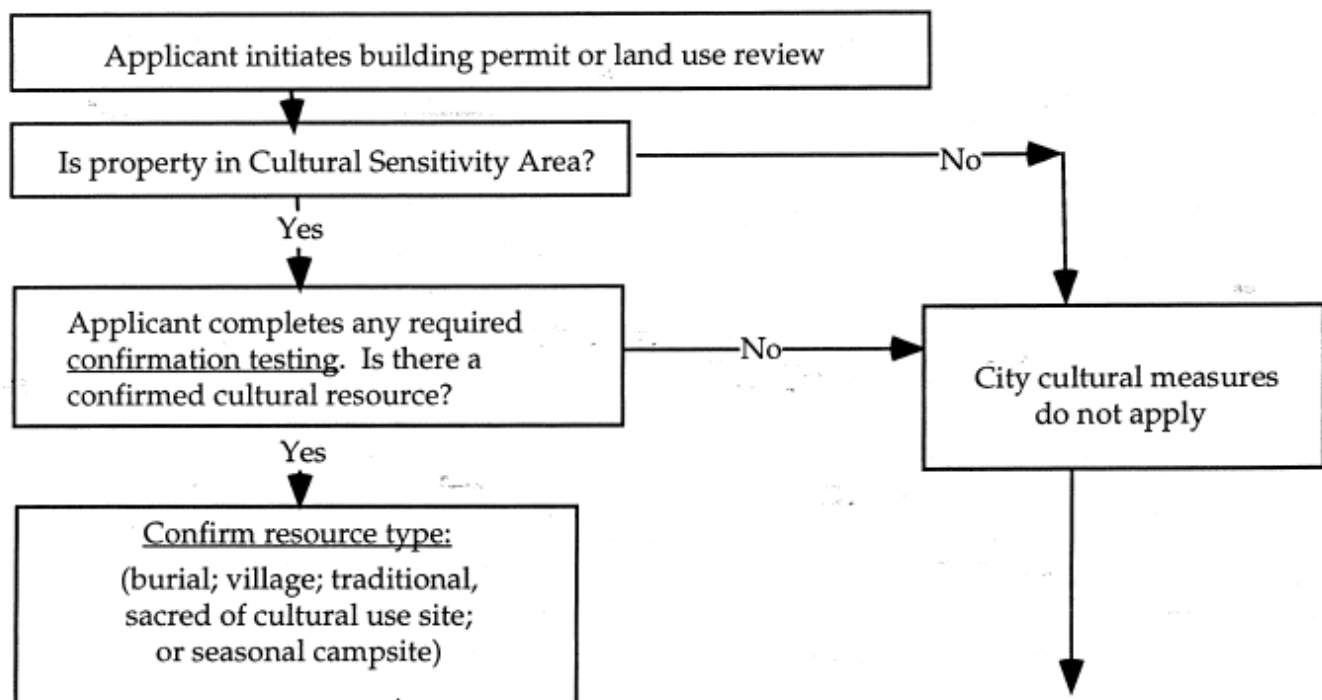
The term "confirmation testing" is defined as performing subsurface auger probes in advance of development. A "transition area" is the area immediately surrounding a confirmed archaeological resource. The transition area can be described in horizontal and vertical proximity to the adjacent archaeological resource.

Figure 17 displays a flowchart for identifying archaeological resources within a sensitivity area. As indicated in the chart, once the required confirmation testing has been completed and no archaeological resources found, no additional survey work is required and development can proceed. If, however, an archaeological site is found during confirmation testing, then the cumulative archaeological test results for that development site will be used to classify each confirmed archaeological resource into one of four resource types. Each resource type is defined below.

- a. **"Burial site"** means evidence of human remains or funerary objects, as defined in Oregon Administrative Rules.

- b. **"Village"** means evidence of a relatively permanent residential location occupied during the winter and on an annual basis. Archaeological evidence may include remains of structures, storage pits and midden deposits.
- c. **"Seasonal campsite"** means evidence of organized activity in extracting and processing resources on a seasonal basis. **"Activity area"** means evidence of a specific activity (e.g., roasting camas bulbs or stone tool making).
- d. **"Traditional, sacred or cultural use site"** means evidence of sacred and ceremonial sites, and may include vision quest sites, sites of other sacred ceremonies and sweat lodge sites.

Figure 17: Decision Steps to Identify Archaeological Sites Within a Sensitivity Area



ECONOMIC ANALYSIS

GENERAL BACKGROUND/FRAMEWORK

This analysis considers the economic consequences of prohibiting, limiting or allowing conflicting uses within the three archaeological sensitivity areas located in the Columbia South Shore plan district. Economic factors considered in this analysis include development potential, property values and marketability, property taxes, public investments, employment, tourism and open space, and site acquisition. The economic consequences of archaeological resource protection may be viewed from the perspective of conflicting uses and from the perspective of the community at large. The conflicting use perspective is discussed below. The community at large perspective is more difficult to quantify in economic terms, and is found in the Social Analysis of this chapter.

Development Potential. For potential conflicting uses (primarily industrial uses), a development site is only suitable if an industrial firm can physically fit onto the site after natural and manmade constraints are accounted for. In the Columbia South Shore, major physical features that affect development potential include the presence of alluvial and hydric soils, location within a floodplain, the Columbia Slough and associated environmentally sensitive areas, and incomplete infrastructure. In the Columbia South Shore, development potential may also be affected by proximity to transportation infrastructure (such as interstate highways, railroads, and airports), zoning designations, adjacent land uses, parcel size, current ownership, and whether the parcel is currently vacant.

The needs of potential conflicting uses vary with regard to building footprint, site access, supporting infrastructure, slope, soil characteristics, and other site characteristics. Among these requirements, the most important ground disturbance activities may be the building footprint and availability of street access. The building footprint typically does not occupy an entire parcel, as vehicle circulation, parking lots, storage areas and landscaping are also commonly provided. The building footprint is situated to promote efficient interaction between the building and the other components of the development. The development works best if street access is direct, and if it supports an efficient circulation pattern within the development. Access to building loading areas and customer parking areas may be important.

The City's areawide archaeological investigation has been able to reduce the areas subject to Goal 5 analysis and possible resource protection. The resulting three archaeological sensitivity areas cover approximately 600 acres. Close to

2,200 acres of the plan district lie outside the sensitivity areas, and also are excluded from further analysis.

Within the three sensitivity areas, a two-step process determines if a development site receives archaeological resource protection. First, a Level 1 archaeological investigation occurs. That is, subsurface samples (augers) are placed along the most likely landform features of the development site. Much of this testing has already been accomplished and only gaps in augering need to be filled. If no evidence of an archaeological site is found, the development site is free of any other pre-development constraints from this plan.

The second step occurs if an archaeological site is found. The protected area is limited to the resource site boundaries plus a specified transition area. The sizes of resource sites already confirmed in the Columbia South Shore plan district range from one tenth of an acre to four and half acres. The median site size is under one-half acre. For example, assuming a 20-acre development site, the average impact of full protection would be less than five percent of that development site.

The impact of a confirmed resource on a site's development potential varies by the relative size, location and method of resource protection, as well as the locational needs of potential development, and other existing site constraints. On some parcels, archaeological resource protection may not have a direct effect as many confirmed sites fall within the existing overlay of environmental protection ("p") zones and required building setback areas. This reduces the impact from an average five percent to two or three percent of the buildable area of impacted parcels.

In cases where the impact on the buildable portion of a development site is relatively high, an adjustment process may provide relief. For instance, the required on-site landscaping (15 percent) can be adjusted to include a protected site location. The adjustment allows landscaping to be clustered or incorporated into the design of a project to meet the total landscaping requirement. The adjustment provides some flexibility for meeting requirements in this protection plan. The plan also recognizes that some development configurations depend on accessibility to infrastructure, such as roads and/or sewer lines, and the needs of the user.

An example cited in the 1988 report, *Columbia Corridor Economic Analysis* report, estimates an average future building coverage of 35 percent per parcel. This suggests that there would be flexibility within the plan district with respect to the actual layout of building space and parking lot areas to accommodate full protection of a confirmed site. One recent change in the Portland zoning code makes it possible to reduce the area required for off-street parking. In September

1995, the zoning code was amended to allow 40 percent of the required parking spaces to meet compact car dimensional standards. The amendment adds to site flexibility and can reduce the land dedicated to parking and the cost of impervious surface.

The *Columbia Corridor Vision*, prepared for the Columbia Corridor Association (1995), recognizes the importance of open space: "...as development occurred there was a recognition that the value of the land for development sites have been increased by the maintenance of certain open space areas." The concept of using site design to protect resources is described in the *Columbia Corridor Vision* (1995) - i.e. "new industrial development along Airport Way has allowed employment opportunities while providing an effective way to protect sensitive environments by use of campus site design."

As stated above, several of the archaeological resources are currently protected by existing "p" zone or building setback regulations. Fewer than nine acres of actual resource sites occur outside these currently protected areas, spread across several parcels. Development within these nine acres and associated transition areas is impacted by new development regulations proposed in this plan. Seven of nine known archaeological resources occupy less than 15 percent of the affected parcel.

The location of resources relative to the local road network is another factor which may impact development potential - by impacting access to property. Two of the nine known resources are located in close proximity to possible street extensions identified in the *Airport Way Secondary Infrastructure Plan*. The seven other known resources do not impact street extensions identified in that infrastructure plan.

Property Values and Marketability. This section discusses the components of land value, the regional land market and potential impacts on value by archaeological resource protection in the plan area. Value is classified into two general categories: value in use and value in exchange. Value in use is the property's value to its owner or user. Exchange value is the market value, the highest price a property would bring if the sale were to take place under conditions ideal for both the buyer and the seller. To have value, a property must have both utility and scarcity. Utility refers to the ability to arouse desire for possession and the power to give satisfaction, based on individual tastes. Without scarcity, even with utility, value diminishes with excessive supply.

The following principles of value (Rockwell et al. 1988) illustrate ways in which property values can be increased or decreased with respect to the location of significant archaeological resources on a site.

- The Principle of Substitution: No one will pay more for a piece of property than they would have to pay for an equally desirable substitute property. For example, there are a limited number of industrial properties containing archaeological resources in the metropolitan area. However, several properties are zoned industrial that contain recorded archaeological resources in the Rivergate Industrial District.
- The Principle of Highest and Best Use: The highest and best use is the one that will provide the greatest net return over a period of time, including amenities as well as monetary returns. Local and national studies have shown that quality of life attributes, such as open spaces, actually increase the likelihood of development for certain types of industrial uses (Frerichs 1994). According to the Columbia Corridor Association, in describing the outstanding features of the area, "The quality of life assures employers that they can recruit and retain key personnel from throughout the United States and the world." In addition, the Columbia Corridor Association reported an industrial property absorption rate of 60 acres annually since 1985. This rate is expected to increase as infrastructure improvements are built. Recent developments in international trade predict that there will continue to be a strong demand for exports requiring industrial lands. This suggests that the highest and best use is industrial.
- Principle of Supply and Demand: Values rise as demand increases and/or supply decreases. Values fall when demand decreases and/or supply increases. However, land scarcity alone does not create demand. The availability of financing, interest rates, wage levels, property taxes, and population growth or shifts are all factors that influence demand and, consequently, property value. In addition, there are locational attributes that strengthen the demand for industrial land by certain users. Examples of such attributes include access to highways, airport freight, and related transportation facilities. The supply of sites offering the attributes desired by particular users is constrained by the availability of secondary infrastructure, natural resource protection, stormwater treatment, floodplain protection and the potential Superfund listing of nearby Gresham properties.
- The Principle of Change: It is the future, not the past, that influences value. Change begins with a period of integration and moves towards equilibrium when a property's value is stabilized. Change ends with disintegration when the property's present economic useful life is over. Due to the presence of archaeological resources within the plan district, there has been a high degree of uncertainty over the consequences for the development community. Federal, state and tribal rights affect

development costs in the event archaeological resources are disturbed. The archaeological resource protection plan reduces this uncertainty, while preserving significant archaeological resources for future generations.

- The Principle of Contribution: Contribution refers to the value that an improvement or a feature adds to the overall value of a property. Significant archaeological resources can increase enjoyment and quality of life amenities for property owners, business firms locating in the plan district and the community as a whole. When quality of life features are important to employers and employees, the increment of value associated with archaeological resources is said to be “capitalized” into the market value of the property. At the same time, the protection of a archaeological resource may require establishment of a conservation easement which limits development or reduces flexibility.
- The Principle of Increasing and Decreasing Returns: There reaches a point where any additional improvements to land either will have no effect or actually will become detrimental to value. Properties currently constrained by the existence of environmental resource protection may not decrease in market value with additional archaeological resource protection where the resources overlap. There is added value for the community as a whole from the protection of significant archaeological resources, as discussed below.

In addition to a demand for land zoned for industrial uses, there are other factors that contribute to the value of industrial properties. Early studies found that access to transportation, suppliers and markets were the determinants of location for many traditional industrial users.

Haug (1991) found that previous studies divided location decisions into two stages: (1) reasons for choosing a particular region; and (2) factors affecting selection of a specific facility site. Table 5 cites studies that address major attributes influencing a location decision.

Table 5: Major Attributes Influencing An Industry's Location Decision

LABOR	The availability, cost and quality of labor as an important locational determinant	Oakey 1981; Premus 1982; Rees and Stafford 1983; Hekman and Greenstein 1985; Malecki 1985; Breheny and McQuaid 1987; and Glasmeier 1988.
	Productivity and availability of professional and technical workers	Galbraith 1985; and Galbraith and De Noble 1988.
	Professional and skilled labor	Breheny and McQuaid 1987.
	Availability of technical personnel and low wage workers	Glasmeier 1988.
EDUCATION	Availability or proximity to educational institutions	Premus 1982; Larsen and Rogers 1988; Malecki 1985, 1986; Markusen et al 1986; Birch 1987; and Hall 1987
	Access to a university is of lesser significance	Galbraith 1985; Howells 1986; Breheny and McQuaid 1987; and Gripaios et al 1989.
	Growth in Colorado Springs, Colorado and Portland, Oregon has been spontaneous and achieved without a major research university	Rogers and Larsen 1984.
	Educational resources are a necessary but not a sufficient condition for the development of high technology industry	Conway 1985.
INFRASTRUCTURE	Communication linkages including access to airport and road transportation systems attract high tech industries	Premus 1982; Malecki 1985; Breheny and McQuaid 1987; and Keeble 1988.
VENTURE CAPITAL	Availability of venture capital to finance new firms is a significant locational factor	Malecki 1985; Malecki 1986; and Markusen et al 1986.
QUALITY OF LIFE	Quality of life features, such as a pleasant working and living environment or access to recreational activities impacts high locational decisions by providing amenities that attract technical and professional workers	Markusen et al 1986; Malecki 1987; Pottier 1987; and Gripaios et al 1989.
COST OF SITES	Availability of plant and office sites and the cost of property and construction	Premus 1982; Breheny and McQuaid 1987; Galbraith and De Noble 1988; and Gripaios et al 1989.
COMMUNITY ATTITUDES	State and local tax structures	Premus 1982.
	State and local governments	Smilor 1988.
	Governmental financial assistance	Haug 1986; Keeble 1988; and Gripaios et al 1989.

Haug (1991) found in the state of Washington that for some industries, startup firms considered quality of life attributes, while small and medium-sized firms considered labor attributes. This indicates that start-up firms may be more likely to locate and value the quality of life attributes provided by the presence of archaeological resources in the plan district.

According to Frerichs (1994), developments for retail, residential and office spaces often bring concerns from the community related to the form and aesthetics of development, while industrial areas focus on function. Current trends, however, are changing in light industrial developments that are almost garden-like where landscaping, trees, shrubs and grass berms have matured to soften and screen industrial buildings. Frerichs points to the developments in the Seattle area such as Renton, Tukwila, Redmond, Bellevue and Kent. Real estate professionals refer to the "flex tech" space as a park-like setting that is equally likely to hold offices, distribution, assembly, repair, and/or computer-oriented tenants.

Haug (1991) found that software firms rated only cultural/recreational and physical environment significant in their location decision. He found major differences across industries. Chemical, machinery, electronics and aerospace indicated that labor costs, skills and productivity were locational determinants. Chemical firms listed the quality of educational institutions and utilities as important to their locational decision. Machinery firms cited local suppliers and infrastructure as important. Electronics firms considered transportation services, while aerospace firms claimed that proximity to other aerospace firms is a major reason for choosing a location.

Facility site factors differ across industries. Aerospace firms ranked space, property and construction costs significantly higher than other industries. R & D/biotechnology firms ranked proximity to a university as important. Aerospace firms were found to have the largest number of significant factors: availability of land and proximity to a Boeing Company facility, material suppliers and vocational institutions were important.

Regional Land Market

The regional industrial real estate market has about 130 million square feet of building space. About 37 million square feet is in leased facilities. The majority of remaining industrial space is owner-occupied. Industrial development has increased at a steady rate, with an increase in recent years, according to Grubb and Ellis. In 1988, the Columbia Corridor Association prepared a report on the Columbia Corridor area that looked at competing industrial sites (CCA 1988) (See Appendix I). The report indicated that Columbia South Shore was the most preferred location based on their methodology.

In September 1994, the City of Portland adopted the *Prosperous Portland* economic development plan (City of Portland, 1994). One of the business development policies of that plan calls for the City to identify target industries. (See Appendix J). The plan calls for the City to pursue the development of target industry

clusters - industries and related businesses whose growth will critically contribute to the City achieving its economic and workforce goals.

In identifying target industries, City strengths were considered. The strengths of Portland include an excellent geographic location for west coast and international trade, and good transportation facilities for moving both goods and people. The warehouse and distribution, and the transportation equipment industries were selected to be among the initial target industries. The warehouse and distribution cluster includes those companies involved in the storage and distribution of products of national and international markets. This cluster capitalizes on Portland's traditional strength as a transportation center with supporting infrastructure of highway, rail, marine, and air facilities. The transportation equipment cluster includes the manufacturing of motor vehicles, railroad equipment, search and navigation equipment, ship repair, and the manufacturing of aircraft parts.

Such target industries as environmental services and equipment and food processing may be attracted to the Columbia South Shore area for its amenity features. These features include the possibility of additional open space areas in which archaeological resources protection may be accomplished. In addition, those industrial users that hope to attract highly skilled labor with on-site amenities and area recreational trail opportunities are likely to locate in the plan district.

According to Grubb & Ellis (1994), the Columbia South Shore area between Interstate 205 and Troutdale is primed for development. They point out that the City of Portland has invested \$72 million into the area to encourage development. They cite proximity to the airport and linkage to Interstate Freeways 205 and 84 as competitive advantages for the plan area. According to Grubb and Ellis (1994), there is a demand in the marketplace for 5,000 to 10,000 square foot spaces with a dock and grade high loading berths at a competitive rate. One indicator of a strong market is a reduction in vacancy rates. For example, the vacancy rates for "flex" space has fallen to 12.6 percent from a high of more than 75 percent in the early 1990s. The vacancy rate for industrial park space is 2.9 percent, down from over 6 percent in 1993. The vacancy rate for manufacturing is 4.0 percent, down from over 10 percent in 1993.

The *Airport Way Marketing and Communications Plan 1995-97*, also points to the area's unique and sustainable advantage provided by having primary infrastructure in place (roads, sewers, utilities) and being located in close proximity to a regional transportation system. Again, the plan area's attractive proximity to Portland International Airport, the three major interstate routes, I-5, I-205 and I-84, rail, deep sea and river shipping services and the downtown professional service center was cited.

Several sources have been reviewed to determine the value of industrial property within the plan district, including an illustrative example in the *1988 Columbia Corridor Economic Analysis* of \$100,000 for a current land value and the average price per acre of \$52,481 in *The Columbia Corridor: A Market Profile*. (1993). In 1994, the Bureau of Planning and the Columbia Corridor Association conducted a survey of commercial sales associates and brokers. The survey found that industrial properties ranged in value from \$1.00 to \$3.65 per square foot.

Respondents to the survey were asked for their professional opinion with respect to target industry locations within the plan district:

- **In the area between N.E. 82nd and I-205:** electronic equipment; health technology/ biotechnology; professional services; environmental services and equipment; food processing; and warehousing and distribution facilities.
- **In the area between I-205 and N.E. 122nd:** electronic equipment; health technology/biotechnology; environmental services and equipment; and professional services.
- **In the area between N.E. 122nd and 185th:** food processing; transportation equipment; and warehousing and distribution facilities.

Development Constraints, Market Perception, and Risk

A study conducted by the Portland Development Commission in 1983 (PDC 1983) found the plan district was not suitable for high technology firms sensitive to rail and airplane vibrations and noise. The report also pointed out that the Columbia South Shore plan district had an "image" problem due to the metal buildings that exist in the plan district.

The following conditions were cited by PDC (PDC 1995) as pre-existing constraints facing the plan district:

1. **Natural resource protection:** Environmental zoning sets 50-foot "no build" buffers along the Columbia Slough in order to protect significant natural resource values.
2. **Potential "Superfund" listing of nearby Gresham properties:** Contamination from Boeing and Cascade Corporation has caused the DEQ and EPA to impose restrictions on use of the City's wellfield system. Property owners view an EPA Superfund listing with concern that it will dissuade developers because of concern for future liability.

3. **Stormwater treatment:** The Columbia Slough does not meet state water quality standards for various pollutants, and has been classified as a “water quality limited” stream. As a result, pollutants from streets and development sites must be controlled. The impact of this issue is tied to the cost of new storm discharges and land necessary to build pre-treatment facilities. Continuation of this classification may result in fines to the City and state-mandated cleanup measures which may emphasize time rather than cost. Both could have adverse economic impacts to the City. Additionally, property owners may have site improvement requirements imposed which also emphasize costly, but time efficient technology, again imposing economic hardship.
4. **Flood plain protection:** The cost to upgrade pumping capacity to meet federal flood control requirements.
5. **Water quality protection:** The City may revise requirements for public and private property to provide containment for hazardous materials spills.
6. **Secondary infrastructure needs:** Public facilities need to be extended to many development sites in the Plan district. The Secondary Infrastructure Plan (SIP) is a coordinated service bureau plan intended to guide secondary infrastructure development in the eastern portion of the Columbia South Shore.

One qualification with respect to development constraints is that no industrial user is expected to cover 100 percent of a property with improvements because of pre-existing regulations, such as building setbacks and/or landscaping requirements. In some cases, the archaeological resources can be protected within the provisions of the landscaping areas or the already designated environmental zones. Potentially, some industrial property users can operate with reduced flexibility and not be affected economically if design elements are addressed in the early stages of the development plan. The archaeological resource protection plan increases the chances that previously un-identified archaeological resources will be discovered early in the development process rather than later. This allows property owners to respond to the presence of archaeological resources before a specific design is underway, reducing the costs of construction delays that might occur if a resource is uncovered later in the development process.

A possible risk associated with development within the plan district is the disturbance/discovery of a previously undiscovered archaeological resource. As previously mentioned in Chapter 2, the Archaeological Resources Protection Act

of 1979 (ARPA) deals with violations of archaeological resources. When archaeological resources are discovered or disturbed, there are existing regulatory consequences for the property owner and/or developer. A recent example (located outside the Plan Area) is the Environmental and Molecular Sciences Laboratory (EMSL) relocation. Construction was stopped during the first week upon discovery of burial remains and related artifacts that had not been identified in a previous archaeological site specific survey.

In addition to federal regulations, the State of Oregon has recently changed the statute dealing with the disturbance of archaeological resources on private land. A person may not excavate, injure, destroy or alter an archaeological site or object or remove an archaeological object from private lands in Oregon unless that activity is authorized by an archaeological permit. A plaintiff (appropriate tribe) shall recover imputed damages in an amount not to exceed \$10,000 or actual damages, whichever is greater. Actual damages include special and general damages, which include damages for emotional distress. In addition, a plaintiff may recover punitive damages upon proof that the violation was willful. Punitive damages may be recovered without proof of actual damages. Under the Goal 5 process, there is no way to completely protect a property owner from the regulations associated with a discovery. However, the designation of sensitivity areas and required augering reduces the risk for those properties included in the inventory designated within the plan district.

The constraining factors listed above illustrate that property values can be negatively affected by perceptions about regulations. As stated above, archaeological resource protection may reduce uncertainty in the development process by promoting the early discovery of previously unknown resources. The risk of discovering archaeological resources in the plan area exists no matter what level of local regulations apply (as explained above). The market, rather than seeing local regulations as a method of reducing risks, may perceive them as added risk. Local regulations, by raising the level of discussion surrounding archaeological resources, may serve to educate the real estate market as to the existing risks in the Plan Area. This awareness can negatively effect property values. It should be noted, however, that in an ideal market, both the buyer and the seller should have accurate knowledge of a property.

Property Taxes. The value of a property relates directly to property taxes owed as a result of Measure 5. Therefore, fluctuations in property value may effect tax revenues. Increasing certainty may stabilize tax revenues. However, it should be recognized that even if substantial tax revenues are generated, if the services required for the property are equal to or greater than the tax contribution, the community at large is no better off as a result of the taxes collected from the area.

Public Infrastructure. The City's *Airport Way Secondary Infrastructure Plan* (SIP), considered the locations of archeological sites recorded with SHPO. The SIP project team provided base mapping and other data to both the Bureau of Planning's archaeological project staff, as well as to representatives of the appropriate tribes. Tribal representatives reviewed drafts of the SIP and provided feedback regarding the alignment of public rights-of-way.

Secondary infrastructure improvements within the district offer a unique opportunity to emphasize the archaeological resources. An example of this is the recent naming of new streets (Chinook Boulevard and Grande Ronde Street) within an industrial subdivision. This provides a locational advantage to firms that would benefit from an address that highlights the archaeological resources within the district. These opportunities can be used for global recognition of the history of the Columbia South Shore.

Employment. One concern has been that the protection of archaeological resources will retard the rate of development and thereby lower expected employment by discouraging firms from locating within the plan district. According to the SIP, the permanent employment anticipated within the General Industrial (IG2) and General Employment (EG2) zones at total build-out is 10,610 and 2,737 jobs, respectively.

For transportation planning purposes, the City estimates employment densities for new light industrial development at 15 employees per acre. The proposed archaeological sensitivity areas cover a total area of 600 acres. Of this area, a portion is currently excluded from development by environmental zoning regulations. In addition, the development regulations associated with this plan effect only development within SHPO recorded archeological sites and within the buffer surrounding these sites. Any sites discovered during future auger testing could similarly effect development potential. Several of the recorded sites fall within existing environmental zones or within required building setbacks, and therefore do not impose any new development constraints. The total area of sites which could potentially conflict with new development is less than 9 acres. This indicates a possible (worst case) loss of up to 141 potential jobs. However, most of the sites comprise only a small proportion of the properties on which they are located, indicating that full employment potential might be realized if designs can adapt to the presence of a site.

Special attention has been given to recruit and retain those industries indicated in Portland Progress as target industries. The recent siting of the Wholesome and Hearty plant within the plan district is an example of a type of development that can take advantage of local amenities. The plant will locate both its headquarters and production staff within one facility. In addition, the company plans to use energy-efficient lighting, special glazing that takes advantage of

daylight and recycled building materials, where possible. The design of the building site will accommodate the environmental and archaeological features of the site. The open spaces created through site design will provide additional park-like amenities for employees within the plan district. At the time of full-build out of the plan district could be under supplied with open space without such enhancements.

Tourism and Open Space. Although there are a variety of methods available to establish value where no markets exist, (e.g., environmental values determined by the use of contingent valuation and hedonic models), there is little evidence that these methods are appropriate for determining the value of archaeological resources. Evidence of economic impacts from archaeological resources, however, can be found in the tourism industry.

According to Meadows (1995), the tourism industry acts as a major revenue source in destination areas by providing payroll to employees and tax revenues to governments. In addition to these revenues, Meadows points out that there is a resident income multiplier associated with tourism, which is typically higher than for manufacturing because tourism is more labor-intensive. This translates into more employee income for local spending. In addition, the goods and services associated with the tourism industry are consumed by tourists locally. Tourism is a means to preserve significant natural and social resources. Attractions, including historic sites and cultural heritage, act as draws for tourists. In 1993, 24.7 million tourists visited Oregon, and spent \$3.4 billion. 54,500 employees worked in the tourist industry, with a payroll of \$642 million.

In 1983, Alphaeus Ohakweh studied the impacts of tourism in the Portland area. He examined the benefits of tourism versus the public costs of developing tourism. Using 1980 data, it was determined that tourism provides significant employment and income-generation possibilities. Tourism also creates more benefits than costs. His research formulated an income and employment multiplier for tourism in Portland of 1.1024. His research indicated that the jurisdictions of Multnomah, Clackamas, and Washington Counties spent a combined total of \$27.8 million to provide tourism services, while earning \$33.5 million in taxes and revenues. The entire metropolitan area earned over \$5.6 million from tourism in 1980.

The 1988 *Oregon Travel and Tourism: Visitor Profile, Marketing and Economic Impacts* report shows that 92 percent of visitors to Oregon are domestic travelers. Most of the trips to Oregon (42.7 percent) originated from California and Washington, and most of the visitors to Oregon (70.6 percent) were on pleasure trips or visiting friends and relatives. Business travelers, including those in the state for conventions or conferences, accounted for only 10 percent of the trips to Oregon. Once in the state, 61.1 percent traveled to the Portland area.

Visitor surveys indicated the most common activity tourists participate in is "relaxing" or sightseeing (79.6 percent). About half of the visitors reported going to an historic site or area. Fifty-seven percent reported hiking, picnicking or camping while in the area. Another 41.9 percent engaged in urban and/or cultural activities, such as going to a restaurant or an artistic event. The survey shows that 97 percent of visitors to Oregon were satisfied or very satisfied with their experience. Satisfaction ratings were lowest for urban activities, including restaurants, cultural activities and directional signage.

A 1993 study conducted by the Portland/Oregon Visitor's Association (POVA) found that 80 percent of the visitors to Portland came to relax or sightsee. Forty-nine percent visited a museum or historical site in Portland. Visitors spent \$1.3 billion in the Portland metropolitan area in 1993. These expenditures yielded 18,627 tourism-related jobs with a payroll over \$275 million. Using the multiplier determined for the area, the real impacts of these expenditures would have been over 20,000 jobs and over \$300 million in payroll.

Tourism was not included among the target industries for the City of Portland because of the nature of the industry. However, in the survey data collected for the target industries project, Mark Clemons of the Portland Development Commission, indicated that "tourism, advertising agencies and other creative services should be added to the list [of additional or potential target industries]." Thirteen hotels are members of the Columbia Corridor Association, which may benefit from the presence of archaeological resources, and the open space associated with them.

The Columbia South Shore plan district provides an opportunity to increase tourism related to sightseeing, relaxation and historic sites. For example, the Columbia Slough Trail provides convenient access to a wide variety of native vegetation and wildlife that was once common along the lower Columbia River. Use of the trail by tourists can enhance their understanding of and respect for the historic significance of the Columbia South Shore. The written materials contained in this Plan can also help educate the tourist community with respect to the sensitivity areas and their historic relevance to the Columbia South Shore plan district.

Site Acquisition. One method of archaeological resource preservation is through site acquisition by a non-profit conservation organization. The Archaeological Conservancy, for example, is dedicated to acquiring and permanently preserving the best of the nation's remaining archaeological sites. The Archaeological Conservancy takes immediate action to preserve endangered archaeological sites by stepping in and acquiring the property.

Acquisitions are made by gift, purchase or a bargain sale to charity, where the seller receives substantial tax benefits. A revolving Preservation Fund is often used to finance emergency acquisitions, then repaid as local funds are raised. Because the Conservancy is private, it is able to act quickly and independently to meet the situation. Funds for the Archaeological Conservancy come from membership dues, individual contributions, corporations and foundations. Income from a permanent Endowment Fund supplements regular fundraising. Money to purchase specific properties is raised locally on a project by project basis. Lines of credit are sometimes utilized in emergency situations.

When an archaeological site is acquired, the Conservancy formally dedicates it as a permanent archaeological preserve. A committee of experts and local interested individuals, including the associated tribal representative, then prepare a 100-year management plan for the preserve.

An example of such an acquisition occurred in Oregon last year with the purchase of a 40-acre parcel known as the "Mazama Restoration Dune Site." As well as containing a fire hearth dating to 6650 B.P. with related artifacts, the site has provided valuable stratigraphy which has allowed archaeologists to date this and related sites in the Fort Rock Basin area of Southeast Central Oregon. A representative from the Conservancy indicated that in most cases market price is paid for such an acquisition, based on its existing zoning.

ECONOMIC CONSEQUENCES OF ALLOWING CONFLICTING USES

All types of development would require some level of ground disturbance, thus impacting each identified archaeological sensitivity area. The following is a discussion of the economic consequences of allowing identified conflicting uses to occur in the Columbia South Shore plan district. This analysis is based on the conflicting uses information presented in the beginning of this chapter. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

Diminished Open Space and Tourism Opportunities. Open space areas and passive recreational uses, such as the Columbia South Shore Recreational Trail, would not impact the archaeological resources as much as industrial/commercial development. The Columbia Slough Trail may also benefit identified archaeological resources by limiting the depth of ground disturbance impacts along the trail alignment of the slough. As stated earlier, construction of a recreational trail would involve ground disturbance to a depth

of six inches, whereas installation of a sanitary sewer line might involve excavation to a depth of ten feet.

A decision to allow conflicting uses can result in loss of significant archaeological resources and reduce the opportunities for tourist activities, such as hiking, sightseeing and visiting historical sites. This will diminish marketing opportunities that result from archaeological resource preservation. For example, businesses and industries could market the presence of archaeological resources to attract well-trained employees. Likewise, the Portland Development Commission could also use this as a component of their marketing effort to attract new business and industry into the plan district.

Diminished Opportunities for Site Acquisition. Allowing conflicting uses can destroy or degrade the context of an archaeological resource, thereby reducing its value to the Archaeological Conservancy. The reason for this is that an archaeological site is not composed only of artifacts scattered on the ground; it is artifacts and their cultural and environmental context. According to a Conservancy representative, they are often willing to buy lands containing evidence of archaeological resources.

Consequences on the Conflicting Use

Development Potential. For the purposes of this analysis, allowing a conflicting use could potentially mean no protection for an archaeological resource. This means no further archaeological testing for the development site, no special restrictions on ground disturbance activities and no special restrictions on adjacent transition areas. This option provides the greatest level of development flexibility.

Allowing a conflicting use, however, does not reduce the risk of uncovering previously undiscovered archaeological resources. If an archaeological resource contains burial artifacts, a number of federal statutes apply with regard to protection of archaeological resources on federal and Indian lands and protection of Indian graves. None of the confirmed sites are located on federal or Indian lands nor are they designated as burial sites at this time.

As stated above, recent changes to state statutes dealing with private lands address consequences for archaeological site disturbance on private land whether intentional or not, including increased penalties for violation and requirements for Tribal notification (See Chapter 2).

Property Values and Marketability. Property values may be affected by the uncertainty and risk of developing on land that contains archaeological resources. Without a clear and objective procedure to follow upon encountering

an archaeological resource, a property owner or developer faces additional costs in terms of time to file the appropriate papers and make private arrangements to meet with the associated tribes. Property values can also be affected by the potential financial liability of disturbing a confirmed archaeological resource.

As discussed above, it is also possible that additional archaeological resource protection measures will increase awareness of the risks involved with development in the plan district, with possibly negative consequences on property values. Allowing conflicting uses fully (imposing no new City archaeological resource protection measures) could reduce the awareness of the risks involved with development in the plan district. It should be noted, however, that in an ideal market, both the buyer and the seller should have accurate knowledge of a property. In the long term, there could be a negative market reaction if buyers are able to purchase property without knowledge of confirmed or potential archaeological resources, and later find they are unable to develop as they had intended.

Public Infrastructure. In the event that an archaeological resource is encountered during the construction of an infrastructure improvement, work must stop, the appropriate papers filed and consultations begun with the associated tribes. In addition, the Standard City Construction Specifications apply. These specifications have provisions that contractually bind contractors to follow an established protocol for public works projects initiated by the City of Portland. Time losses and additional administrative costs could be incurred.

Employment. In the event that an archaeological resource is encountered during the development of a facility, time delays can effect employment opportunities for the local labor force.

ECONOMIC CONSEQUENCES OF LIMITING CONFLICTING USES

The following is a discussion of the economic consequences of limiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

All types of development would require some level of ground disturbance as described above. Any limitations to these ground disturbance activities will help to protect the integrity of archaeological resources.

Consequences on the Resource

Diminished Open Space and Tourism Opportunities. Open space areas and passive recreational uses, such as the Columbia South Shore Recreational Trail, would not impact the archaeological resources as much as industrial/commercial development. The Columbia Slough Trail may also benefit identified archaeological resources by limiting the depth of ground disturbance impacts along the trail alignment of the slough. As stated earlier, construction of a recreational trail would involve ground disturbance to a depth of six inches, whereas installation of a sanitary sewer line might involve excavation to a depth of ten feet.

A decision to limit conflicting uses can result in some loss of significant archaeological resources and a reduction of opportunities for tourist activities, such as hiking, sightseeing and visiting historical sites. This will diminish marketing opportunities that result from archaeological resource preservation. For example, businesses and industries could market the presence of archaeological resources to attract well-trained employees. Likewise, the Portland Development Commission could also use this as a component of their marketing effort to attract new business and industry into the plan district.

Diminished Opportunities for Site Acquisition. Limiting conflicting uses can degrade the context of the archaeological resource, thereby reducing its value to the Archaeological Conservancy. The reason for this is that an archaeological site is not composed only of artifacts scattered on the ground; it is artifacts and their cultural and environmental context which together constitute an archaeological resource. According to a Conservancy representative, they are often willing to pay market value for lands containing archaeological resources.

Consequences on the Conflicting Use

Development Potential. For the purposes of this analysis, limiting a conflicting use means completing archaeological "confirmation testing" for that development site. Limited protection allows partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials. This option includes some level of protection for adjacent transition areas. Limited protection provides a high level of development flexibility, while establishing a process to protect a portion of the value of archaeological resources.

Allowing a conflicting use, however, does not reduce the risk of uncovering previously undiscovered archaeological resources. If an archaeological resource contains burial artifacts, a number of federal statutes address protection of archaeological resources on federal and Indian lands and protect Indian graves. In addition, OAR 736-51-090 applies to private lands as described earlier.

To the extent that "confirmation testing" is completed and no archaeological resources are located within the building envelope and adjacent impervious surfaces, such as parking lots, etc., the uncertainty that once may have impacted the development of a property is reduced. On parcels where there is currently insufficient testing, the cost of additional augering and reporting will be incurred by the property owner or developer.

The average cost of augering and reporting varies by economies of scale such that the more augers drilled on a development site, the cheaper the cost per auger. For example, one archaeological consultant estimated the cost of drilling one auger probe and writing a one page findings report to be approximately \$400. The cost of drilling 20 auger probes and writing a findings report, on the other hand, was estimated to be \$5,500 (or \$275 per auger). In the Columbia South Shore plan district, most property owners or developers of parcels needing additional confirmation testing will incur a cost of between \$2,000 and \$5,000 per parcel. On larger sized parcels, the confirmation testing can cost as much as \$10,000, depending on the number of auger probes drilled and the extent of archaeological materials found.

In the event that an archaeological resource is confirmed, development potential is impacted differentially, depending on the type of resource, depth of resource and design footprint. If the resource is located within areas already designated in an environmental protection ("p") zone, there are no impacts on development from archaeological resource protection. If the resource is located within the building setback or area designated for landscaping, there is very little impact on development. It may be necessary to keep equipment and supplies away from the resource site during construction.

If the resource is located in the center of a parcel, it may be difficult to site some development types. No individual parcel is completely covered by a resource site. Seven of nine known resource sites cover less than 15 percent of the affected parcel. However, assuming no development is possible on a given parcel, the resource site may be of value to the Archaeological Conservancy. The Archaeological Conservancy is dedicated to acquiring and permanently preserving the best of the nation's remaining archaeological sites. The Archaeological Conservancy takes immediate action to preserve endangered archaeological sites by stepping in and acquiring the property. (Refer to earlier discussion of site acquisition for details).

When an archaeological site is acquired, the Conservancy formally dedicates it as a permanent archaeological preserve. A committee of experts and local interested individuals, including the appropriate tribal representative, then prepare a 100-year management plan for the preserve.

Property Values and Marketability. Property values may be affected by the uncertainty and risk of developing on land that contains archaeological resources. To the extent that "confirmation testing" is completed and no archaeological resources are located within the building envelope and adjacent impervious surfaces, such as parking lots, etc., the uncertainty that once may have impacted a property is removed. On parcels where there is currently insufficient testing, the cost of additional augering and reporting will be incurred by the property owner or developer. The average cost of augering and reporting varies by economies of scale, depending on the number of auger probes drilled and the extent of archaeological materials found, as described above.

As discussed above, it is possible that additional archaeological resource protection measures will increase awareness of the risks involved with development in the plan district, with negative consequences on property values. It should be noted, however, that in an ideal market, both the buyer and the seller should have accurate knowledge of a property. In the long term, there could be a negative market reaction if buyers are able to purchase property without knowledge of confirmed or potential archaeological resources, and later find they are unable to develop as they had intended. Confirmation testing reduces the risk of discovering new archeological sites later in the development process. This process of systematic testing provides a mechanism for reducing the risk for potential buyers, and as a result may increase the value of parcels which have completed the testing process.

Public Infrastructure. To the extent that "confirmation testing" is completed and no archaeological resources are located within the area designated for infrastructure improvements, construction can proceed on schedule. If a resource site is confirmed, the Standard City Construction Specifications apply. These specifications have provisions that contractually bind contractors to follow an established protocol for public works projects initiated by the City of Portland.

Employment. To the extent that "confirmation testing" is completed and no archaeological resources are located within the area designated for development, there are no impacts on employment opportunities. In the event that an archaeological resource is confirmed, development potential is impacted differentially, depending on the type of resource, depth of the resource and the design footprint. If the resource is located within areas already designated in an environmental protection ("p") zone, there are no impacts on development. If the resource is located within the building setback or area designated for landscaping, there is very little impact on development. It may be necessary to keep equipment and supplies away from the resource site during construction. If the resource is located in the center of a parcel, it may be difficult to site some development types and some employment opportunities may be forgone on that

particular parcel. At this time, there are a variety of sites available within the plan district to accommodate employment opportunities in the event that a certain parcel is not suitable due to the location of a archaeological resource. No individual parcel is completely covered by a resource. Seven of nine known resources cover less than 15 percent of the affected parcel.

ECONOMIC CONSEQUENCES OF PROHIBITING CONFLICTING USE

The following is a discussion of the economic consequences of prohibiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

All types of development would require some level of ground disturbance as described above. Prohibiting a conflicting use from creating these ground disturbance activities will help to protect the integrity of archaeological resources.

Consequences on the Resource

Open Space and Tourism Opportunities. Open space areas and passive recreational uses, such as the Columbia South Shore Recreational Trail, would not impact the archaeological resources as much as industrial/commercial development. The Columbia Slough Trail may also benefit identified archaeological resources by limiting the depth of ground disturbance impacts along the trail alignment of the slough. As stated earlier, construction of a recreational trail would involve ground disturbance to a depth of six inches, whereas installation of a sanitary sewer line might involve excavation to a depth of ten feet. In general, full protection of an archaeological resource that is located at a significant depth below the surface of the ground, the ground disturbance resulting from the trail construction and use will not prevent this use.

A decision to prohibit conflicting uses can result in the preservation of significant archaeological resources and opportunities for tourist activities, such as hiking, sightseeing and visiting historical sites. This will strengthen the marketing opportunities that result from archaeological resource preservation. For example, businesses and industries could market the presence of archaeological resources to attract well-trained employees. Likewise, the Portland Development Commission could also use this as a component of their marketing effort to attract new business and industry into the plan district.

Opportunities for Site Acquisition. Prohibiting conflicting uses can preserve the context of the archaeological resource, thereby preserving its value to the Archaeological Conservancy. According to a Conservancy representative, they are often willing to pay market value for lands containing archaeological resources.

Consequences on the Conflicting Use

Development Potential. For the purposes of this analysis, prohibiting a conflicting use means completing archaeological "confirmation testing" for that development site. Full protection means no ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials and some level of protection for adjacent transition areas.

To the extent that "confirmation testing" is completed and no archaeological resources are located within the building envelope and adjacent impervious surfaces, such as parking lots, etc., the uncertainty that once may have impacted the development of a property is removed. On parcels where there is currently insufficient testing, the cost of additional augering and reporting will be incurred by the property owner or developer. The average cost of augering and reporting varies by economies of scale, depending on the number of auger probes drilled and the extent of archaeological materials found, as described above.

In the event that an archaeological resource is confirmed, development potential is impacted differentially, depending on the type of resource, depth of the resource and the design footprint. If the resource is located within areas already designated in an environmental protection ("p") zone, there are no impacts on development. If the resource is located within the building setback or area designated for landscaping, there is very little impact on development. It may be necessary to keep equipment and supplies away from the resource site during construction.

If the resource is located in the center of a parcel, it may be difficult to site some development types. No individual parcel is completely covered by a resource site. Seven of nine known resource sites cover less than 15 percent of the affected parcel. However, assuming no development is possible on a given parcel, other options may exist.

If a resource meets requirements for SHPO designation, the site is likely to be of value to the Archaeological Conservancy. The Archaeological Conservancy is dedicated to acquiring and permanently preserving the best of the nation's remaining archaeological sites. The Archaeological Conservancy takes immediate action to preserve endangered archaeological sites by stepping in and acquiring the property. Acquisitions are made by gift, purchase or a bargain sale

to charity, where the seller receives substantial tax benefits. A revolving Preservation Fund is often used to finance emergency acquisitions, then repaid as local funds are raised. Because the Conservancy is private, it is able to act quickly and independently to meet the situation. Funds for the Archaeological Conservancy come from membership dues, individual contributions, corporations and foundations. Income from a permanent Endowment Fund supplements regular fundraising. Money to purchase specific properties is raised locally on a project by project basis. Lines of credit are sometimes utilized in emergency situations. When an archaeological site is acquired, the Conservancy formally dedicates it as a permanent archaeological preserve. A committee of experts and local interested individuals, including the appropriate tribal representative, then prepare a 100-year management plan for the preserve.

As previously indicated, the average size of a confirmed archaeological site is approximately 5 percent of any parcel. It may be possible to use the 15 percent landscape requirement to mitigate the loss of developable site area. The creation of open spaces can in some cases enhance the design elements of a project for certain industries that must compete with "campus-style" light industrial parks. The cultural context of the plan district also attracts some types of development.

Property Values and Marketability. Property values may be affected by the uncertainty and risk of developing on land that contains archaeological resources. To the extent that "confirmation testing" is completed and no archaeological resources are located within the building envelope and adjacent impervious surfaces, such as parking lots, etc., the uncertainty that once may have impacted a property is removed. On parcels where there is currently insufficient testing, the cost of additional augering and reporting will be incurred by the property owner or developer. The average cost of augering and reporting varies by economies of scale, depending on the number of auger probes drilled and the extent of archaeological materials found, as described above.

In the event that an archaeological resource is confirmed on a parcel, the location of the resource impacts the value differentially. In some cases, as previously discussed, careful site design allows for the accommodation of open space without reducing the viability of a project. If the location of the archaeological resource prevents a particular development proposal, other development proposals may be possible. In that case, the property value may be discounted to reflect the remaining development potential. If an archaeological resource prevents any development from occurring on a parcel, the property may be purchased by the Archaeological Conservancy.

As discussed above, it is also possible that additional archaeological resource protection measures will increase awareness of the risks involved with development in the plan district, with negative consequences on property values.

It should be noted, however, that in an ideal market, both the buyer and the seller should have accurate knowledge of a property. In the long term, there could be a negative market reaction if buyers are able to purchase property without knowledge of confirmed or potential archaeological resources, and later find they are unable to develop as they had intended. The protection measures proposed with this plan would insure that potential buyers have adequate warning of potential development risks. In addition, confirmation testing reduces the risk of discovering new archeological sites later in the development process. This process of systematic testing provides a mechanism for reducing the risk for potential buyers, and as a result may increase the value of parcels which have completed the testing process.

Public Infrastructure. To the extent that "confirmation testing" is completed and no archaeological resources are located within the area designated for infrastructure improvements, construction can proceed on schedule. If a resource site is confirmed, the Standard City Construction Specifications apply. These specifications have provisions that contractually bind contractors to follow an established protocol for public works projects initiated by the City of Portland.

Employment. To the extent that "confirmation testing" is completed and no archaeological resources are located within the area designated for development, there are no impacts on employment opportunities. In the event that an archaeological resource is confirmed, development potential is impacted differentially, depending on the type of resource, depth of the resource and the design footprint. If the resource is located within areas already designated in an environmental protection ("p") zone, there are no impacts on development. If the resource is located within the building setback or area designated for landscaping, there is very little impact on development. It may be necessary to keep equipment and supplies away from the resource during construction. If the resource is located in the center of a parcel, it may be difficult to site some development types and some employment opportunities may be forgone on that particular parcel. At this time, there are a variety of sites available within the plan district to accommodate employment opportunities in the event that a certain parcel is not suitable due to the location of an archaeological resource. No individual parcel is completely covered by a resource site. Seven of nine known resource sites cover less than 15 percent of the affected parcel.

Table 6: Summary of Economic Consequences

Consequences on the Resource by Functional Resource Value

Topic of Analysis	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Open Space and Tourism	Negative	Negative	Positive
Acquisition to preserve sites	Negative	Negative	Positive

Consequences on Conflicting Uses

Topic of Analysis	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Development Potential	Neutral w/ risk	Neutral w/ reduced risk	Neutral w/ reduced risk
Property Values and Marketability	Neutral w/risk	Positive w/ reduced risk	Positive w/ reduced risk
Property Taxes	Neutral w/risk	Positive w/ reduced risk	Positive w/ reduced risk
Public Infrastructure	Neutral w/risk	Neutral w/ reduced risk	Neutral w/ reduced risk
Employment	Neutral w/risk	Neutral w/ reduced risk	Neutral w/ reduced risk
Net consequences	Neutral w/ risk	Neutral to Positive w/ reduced risk	Neutral to Positive w/ reduced risk

Note: A “positive” statement indicates that the positive consequences are greater than the negative consequences. The statement that consequences are “positive” does not imply that there are no negative consequences. A statement that the consequences are “neutral” indicates that the negative consequences and positive consequences are roughly proportional.

ECONOMIC RECOMMENDATIONS

Archaeological resources have been found throughout the Columbia South Shore, particularly along the edges of historic wetlands and water bodies. Industrial and commercial development results in re-grading and excavating the land, possibly exposing or destroying archaeological resources. Full and limited protection of archaeological resources in the Columbia South Shore will result in generally positive impacts. With no protection measures in place, an archaeological resource is at risk of being destroyed or exposed. The discovery or destruction of archaeological resources late in the development process can have large (negative) economic consequences. Although the current Goal 5 procedure does not protect a property owner or developer completely from a "discovery" situation, conducting the recommended augering reduces the risk of construction delays or the need to completely relocate a project. Both these possibilities are expensive compared to the cost of completing the necessary augering.

Where an archaeological resource is located in an already protected environmental zone, within a building setback area or within the 15 percent landscaping requirement, there is little economic impact. In the event that the location of an archaeological resource conflicts with a building footprint or street access, the applicant may have several options. These options include requesting an adjustment to vary, relocate, or waive certain development standards (e.g. setbacks for buildings and landscaping); building a parking lot or vehicle circulation area in the transition area (which extends above and sideways from the buried resource); and/or negotiating a private agreement with appropriate Oregon tribes for resource recovery. These options retain substantial development potential.

In addition to these options, acquisition of an archaeological resource may be possible. Planning staff has met with representatives of the Archeological Conservancy, a nonprofit organization that acquires certain archeological sites for long term preservation. Acquisitions are made in the form of gift, purchase at full market value or bargain sale to charity, where the seller receives substantial tax benefits.

SOCIAL ANALYSIS

GENERAL BACKGROUND/Framework

This analysis considers the social consequences of prohibiting, limiting or allowing conflicting uses within the three archaeological sensitivity areas located in the Columbia South Shore. Social consequences considered in this analysis include effects on functional values associated with each archaeological sensitivity area. These cultural resource values include heritage and scientific values; recreational and educational opportunities; visual variety and impact; urban design and image of the City; and screening and buffering of incompatible uses. These values are significant because they represent benefits to the Columbia South Shore plan district and the greater community, including associated tribes.

Heritage and Scientific Values. The Columbia South Shore, including the Columbia Slough and nearby natural resources, are remnants of a vast and complex series of waterways and wildlife habitat areas of the Columbia River floodplain. Prior to the arrival of Euroamerican settlers, this area was used extensively by American Indian peoples, particularly for such transitory activities as food gathering, hunting and fishing. The Columbia River, and nearby Willamette River, provided significant major routes of commerce for American Indian peoples residing in the area. As reported in Chapter 5, trading activity took place throughout the year with the most often mentioned item of trade being wapato. Significant archaeological sites remain which contain locally and, in certain cases, regionally significant cultural resources with a broad range of heritage and scientific values.

Archaeology is the scientific study of cultural material remains in the context in which they are found. It is a science that attempts to glean new knowledge from items that are unable to impart the information themselves. Archaeological contributions to science are vast. An archaeological site is not composed only of artifacts scattered on the ground; it is artifacts and their cultural and environmental context. Thus, archaeological sites provide significant insight to the evolution of the earth and human adaptation to the natural environment (human ecology). Such ecological processes as climate change, processes of erosion, floral and fauna succession and hydrologic change are key elements in archaeological research and provide important clues to the past.

Archaeological sites are the products of social groups whose descendants may still exist. As such, these cultural resources, and their associated heritage values, are an integral part of the lives of American Indian descendants, and are central

to the preservation of Tribal communities and associated lifeways -- in essence, their heritage. The historical and spiritual connection between living American Indian peoples and their ancestors is communicated through their connection with the land. In sustaining and preserving their lifeways, American Indians look back seven generations and look ahead seven generations for guiding their use of the land. The land provides physical and spiritual sustenance as well as a connection to the past. Each of these elements is enhanced by the existence of cultural sites and their environmental context. Without a connection to the past, American Indian descendants would lose a vital part of their social fabric and, therefore, their identity as a distinct and valuable culture.

The symbolic connection between American Indian peoples and the Earth is important to the survival of traditional culture because a spiritual relationship with other life forms pervades all aspects of life (Pavel, Miller and Pavel, 1993, 55). This connection is evident in the value American Indian descendants assign to such activities as hunting, fishing, digging roots, gathering native plants for medicinal uses and picking berries. Each activity represents a spiritual and social component that is viewed as essential to maintain cultural identity and continuity. For example, often gathering is performed in a ceremonial manner that is necessary to the success of the spiritual practice in which the materials will be used.

The Columbia South Shore plan district contains a wide variety of native vegetation and wildlife that was once common along the lower Columbia River. These important environmental features form the basis for unique aspects of traditional American Indian culture, and as such are revered. This reverence extends from an attachment to place that serves as a sacred connection to the past. Knowledge of this sacredness is passed through generations by oral traditions, performance of rituals and personal experiences. A cultural resource site links the present with the past by marking where ancestral use of the land occurred. The connection between American Indians both living and dead cannot be overemphasized. Traditional beliefs regarding the dead include the understanding and well-being of the living is tied to the well-being of the dead. For example, the disturbance of American Indian remains that have not been allowed to go back completely to the earth is considered by many to make every significant effort of the Tribe tinged with failure.

Recreational and Educational Opportunities. Cultural resource sites provide many opportunities for recreation and education when they are associated with each other and the surrounding environment as components of the Columbia South Shore's rich history. Reference to the cultural resource sites along the Columbia Slough trail (through interpretative signs) is a useful medium for this to occur. Interpretative signs could be placed along the trail which convey the importance of traditional American Indian culture, lifeways and religious

ceremonies to their tribal heritage and cultural stability. The signs could also be used to tie Columbia South Shore to other areas along the lower Columbia River basin that experienced early contact between American Indians and Euro-Americans. Greater knowledge of cultural resource sites in the three sensitivity areas further enhance our understanding of the historical context of the Columbia South Shore.

Connecting cultural resource sites through the Columbia Slough Recreational Trail could benefit tribal ancestors and the Portland community by providing convenient access to a wide variety of native vegetation and wildlife that was once common along the lower Columbia River. Each identified cultural resource site represents a unique educational opportunity for tribal ancestors who rely on hands-on experience and oral traditions to impart the knowledge of important community lifeways to future generations. Tribal representatives have indicated a desire for access to archaeological sensitivity areas for tribal ceremonies and training of their youth. Apparently, Indian reservations of associated tribal governments do not have a micro-climate supportive of native plant communities (e.g., camas, wapato) needed for such ceremonial and educational practices. Having access to these sites makes it possible to practice traditional activities such as gathering plants and their fruits for spiritual/ceremonial uses and remembering the history of their people.

Other educational opportunities extend from use of the Columbia Slough Trail by local schools and tourists to enhance their understanding of and respect for traditional community lifeways and spiritual/ceremonial activities. If used in this manner, the trail can help build an on-going dialog between area residents, businesses, American Indians (some of whom are City residents and business people) and tourists. This dialog can promote recognition and acceptance of differences between cultures with the goal of increasing tolerance and respect for these differences. Through the Cultural Resources Advisory Committee, the Bureau of Planning has fostered cross-cultural exchange between these groups.

Other recreational opportunities afforded by the Columbia Slough Trail include fishing, limited boating, wildlife viewing, and local hiking to selected resource locations. Knowledge of the existence of cultural resource sites in the Columbia South Shore serves to enhance these recreational opportunities.

Visual Variety and Impact. The Columbia South Shore consists of low-lying, gently rolling terrain containing typical floodplain features such as sloughs, ponds, small lakes and marshes. The low-lying terrain is broken occasionally by a few higher ridges, some of which are remnant gravel bars from late Pleistocene Missoula floods described in Chapter 3. The Columbia Slough trail and Marine Drive are identified recreational and scenic resources. Protection of adjacent cultural resource sites would further enhance these resources.

On a smaller scale, the riparian strip along the Columbia Slough provides a strong sense of orientation, and an edge or seam between sub-areas and land uses. Restoration efforts that include the planting of pre-contact era native vegetation enhance the visual variety of the Columbia South Shore while also adding to the heritage values of the archaeological sensitivity areas. The Portland Bureau of Environmental Services (BES) has initiated enhancement projects for sections of the Columbia Slough within the plan area and in the Smith-Bybee Lakes area. On the Ramsey Lake project (located in the Rivergate industrial area) BES staff met with tribal representatives to review the wetland design and the selection of native plants. Such restoration efforts provide both environmental and social benefits to the community of Portland, including associated Tribes and area residents and businesses. These plants will help reduce pollutants and sediment loads of the Columbia Slough and enhance the heritage values of the archaeological sensitivity areas.

Urban Design and Image of the City. Mountain and river views are well-established amenities for commercial and residential developments, adding to market demand. Identification of cultural resources in the Columbia South Shore can increase the value of such amenities by further enhancing the City's sense of character, place and uniqueness. This reinforces Portland's image as a livable city that promotes and protects cultural diversity, and ties Columbia South Shore to other areas along the middle Columbia River basin that experienced early contact between American Indians and EuroAmericans.

Screening and Buffering of Incompatible Uses. Archaeological sensitivity areas can act as an edge to different land uses, separating and buffering them from each other both visually and by distance, thus reducing the potential for conflicts.

SOCIAL CONSEQUENCES OF ALLOWING CONFLICTING USES

All types of development would require some level of ground disturbance, thus impacting each identified archaeological sensitivity area. The following is a discussion of the social consequences of allowing identified conflicting uses to occur in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Maximum building coverage for an industrial use in IG2 and EG2 zones is 85 percent of the site area and there is a minimum required landscaped area of 15 percent. One third of landscaped areas may be covered with walkways and other impervious surfaces. Subject to environmental zone limitations, up to 100

percent of a development site may experience ground disturbance activities (buildings, exterior development, utilities, landscaping and water quality facilities). Industrial development is typically single-story, with land-extensive exterior development. When sites are filled or leveled, large areas are paved or covered with buildings, and existing vegetation is reduced. At full buildout, industrial developments typically cover 80 to 90 percent of a development site with impervious surface materials.

Activities associated with commercial development which are detrimental to cultural resources are generally the same as for industrial development, although commercial developments typically have fewer outdoor activities, such as storage and assembly. Maximum building coverage and impervious surface coverages are also similar to those described for industrial uses.

Basic utilities are infrastructure services that need to be located in or near the area where the service is provided. Examples of basic utilities include sewer and water lines, gas lines, storm water detention areas, monitoring wells and pump stations. Most utilities have been and will be placed underground, thus the potential impact of utilities on cultural resources in the Columbia South Shore plan district is relatively high due to the ground disturbance activities associated with burying utilities in the ground. The volume and shape of soil excavated varies by basic utility.

Rail lines include rail spurs that serve individual development sites. Their effects are the same as basic utilities, except that construction of rail lines often requires substantial excavation and fill to meet 0-3 percent slope standards. Radio and television broadcast facilities may be self-supporting, guyed or mounted on poles or existing buildings. Ground disturbance activities vary with placement of these facilities. The potential impact of residential uses on cultural resource sites comes from associated parking lots and walkways that lead to houseboat moorage sites.

Adverse impacts on cultural resource sites can occur from agricultural operations which include clearing of vegetation, plowing of fields, exposing bare soils and application of pesticides, herbicides and fertilizers. The plow zone is assumed to be between 18-24 inches in depth and may impact cultural resource sites on a given development site. Cultural materials within the plow zone are tilled and displaced from their context.

Consequences on the Resource

Loss of Heritage Values. The destruction of identified cultural resource sites would eliminate or degrade a significant reminder of the historic and pre-historic conditions along the Columbia River. These cultural resources, and their associated heritage values, are an integral part of the lives of contemporary American Indian peoples. Any loss of these resources would jeopardize the historical and spiritual connection between living Native American peoples and their ancestors. Preservation of significant cultural resource sites provides a “place” context within which this connection can occur. Without a connection to the past, American Indian descendants will lose their social fabric and, therefore, their identity as a distinct culture.

The Columbia South Shore has been significantly altered from its natural state by agricultural, industrial and urban developments over the last century. Failure to protect cultural resource sites from such development activities and associated ground disturbance activities will result in continued alteration of natural landforms and native plant communities in the Columbia South Shore, thereby destroying or degrading benefits to the Portland community that are provided by associated heritage values.

Loss of Scientific Values. The destruction of identified cultural resource sites would also eliminate a significant source of evidence and information with regard to the past. The Columbia South Shore has been a dynamic environment subject to many natural processes. Archaeological sites provide significant insight to these processes as well as data on chronology and such cultural processes as technological development, religion, trade, politics and burials. A site is not only composed of artifacts scattered on the ground; it is artifacts and their context that provides important clues to the past. For these reasons, archaeological sites contribute to a variety of disciplines, including anthropology, history, hydrology, geomorphology, zoology, botany, forensic medicine and ecology. Failure to protect the cultural resource sites from identified conflicting uses will diminish important scientific values described above.

As the Portland metro area, Columbia gorge and other former Indian use sites develop, fewer undisturbed cultural resource sites remain. The undeveloped portions of Columbia South Shore, particularly the three sensitivity areas, represent a shrinking pool of candidate sites to investigate.

Diminished Recreational and Educational Opportunities. The Columbia South Shore plan district is projected to develop at a rapid rate, particularly now that the Airport Way project is complete. Airport Way serves as the district collector and connects Interstates 205 and 84.

Allowing unrestricted industrial or commercial development has several consequences. First, unrestricted development could preclude or diminish future access to the Columbia South Shore Recreational Trail by tourists and community members. Access to the wide variety of native vegetation and wildlife also provides an important educational opportunity for tribal ancestors who rely on such access to impart important community lifeways to their youth through hands-on experience and oral tradition. Second, reservations often do not have the unique environmental conditions needed for such native plant communities as wapato and camas. These plant communities are essential for certain ceremonial and educational experiences. Failure to adequately protect archaeological sensitivity areas would diminish or destroy such opportunities. Third, ground disturbance activities associated with commercial and industrial development pose significant impacts to cultural resources. These activities include excavation, grading, soil compaction and underground utility line extension. Each of these activities could seriously degrade or destroy any cultural resources existing on-site, depending on their location.

Passive recreational uses, such as the Columbia South Shore Recreational Trail, would not impact the cultural resources as much as industrial/commercial development. The Columbia Slough Trail may also benefit identified cultural resources by limiting the depth of ground disturbance impacts along the trail alignment of the slough. As stated earlier, construction of a recreational trail would involve ground disturbance to a depth of six inches, whereas installation of a sanitary sewer line might involve excavation to a depth of ten feet.

Diminished Visual Variety and Impact. The Columbia South Shore consists of low-lying, gently rolling terrain containing typical floodplain features such as sloughs, ponds, small lakes and marshes. The Columbia Slough trail and Marine Drive are identified recreational and scenic resources. Protection of adjacent cultural resource sites would further enhance these resources. Allowing unrestricted industrial and commercial development along the Columbia Slough would diminish the edge cultural resource sites provide between sub-areas and land uses.

Diminished Image of the City. Significant cultural resources help to provide a sense of character, place and uniqueness to the City of Portland. Loss of these resources to industrial or commercial development would harm the city's image, which promotes "livability" and cultural diversity.

Diminished Screening and Buffering of Incompatible Uses. Cultural resources can act as an edge to different land uses, separating and buffering them from each other both visually and by distance. Allowing conflicting uses would detract from this buffer, and would either require changes in land uses to resolve issues of incompatibility or the creation of artificial buffers.

Consequences on the Conflicting Use

Loss of Heritage and Scientific Values. All types of development would require some level of ground disturbance, thus impacting each identified archaeological sensitivity area. The destruction of identified cultural resource sites would eliminate or diminish a significant reminder of the historic and pre-contact conditions along the Columbia River.

Diminished Recreational and Educational Opportunities. Cultural resource sites provide many opportunities for recreation and education when they are associated with each other and the surrounding environment as components of the Columbia South Shore's rich history. Reference to the cultural resource sites along the Columbia Slough trail (through interpretative signs) is a useful medium for this to occur. Interpretative signs could be placed along the trail that convey the importance of traditional American Indian culture, lifeways and religious ceremonies to tribal heritage and stability. The signs could also be used to tie Columbia South Shore to other areas along the middle Columbia River basin that experienced early contact between American Indians and Euro-Americans, thus, further enhancing our understanding of the historical context of the Columbia South Shore.

Allowing conflicting uses would diminish potential educational and recreational opportunities for employees of businesses and industry located in the Columbia South Shore. For example, there is a greater appreciation of scenic and natural resource elements when their historical use pattern is connected to cultural resource sites.

In addition, as discussed in the economic analysis, quality of life features (e.g., pleasant working and living environment or access to recreational activities) impacts industry locational decisions by providing amenities that attract technical and professional workers. Allowing conflicting uses would diminish an employer's ability to attract this labor pool with on-site amenities and area recreational trail opportunities.

Diminished Visual Variety and Impact. A decision to allow conflicting uses will result in a loss of visual variety in the Columbia South Shore plan district, thereby decreasing the desirability of locating in the district by image-conscious businesses and industries. There is a greater appreciation of scenic and natural resource elements when their historical use pattern is connected to cultural resource sites. As discussed in the economic analysis, the Portland Development Commission identified several constraints as placing a burden on properties within the plan district. One such constraint was the image conveyed by existing metal buildings and their blank wall effect. The potential blank wall effect of

industrial developments can be overwhelming if not broken up by additional open space areas which incorporate cultural resource elements.

Diminished Image of the City. Mountain and river views are well-established amenities for commercial and residential developments, adding to market demand and creating a desirable work environment. Identification of cultural resources in the Columbia South Shore can increase the value of such amenities by further enhancing the City's sense of character, place and uniqueness. This reinforces Portland's image as a livable city that promotes and protects cultural diversity. It will also tie Columbia South Shore to other areas along the middle Columbia River basin that experienced early contact between American Indians and Euro-Americans.

A decision to allow conflicting uses and destroy cultural resource sites would tarnish the City's image as well as the image of any business or industry that supported this decision. Many businesses and industries are image conscious and might choose to locate elsewhere. Allowing the conflicting use could damage relations between businesses and associated tribes and could further tarnish the businesses' image with respect to dealing with sensitive tribal issues.

Diminished Screening and Buffering of Incompatible Uses. The Columbia South Shore is home to primarily industrial and commercial uses. By locating additional industrial and commercial uses in the plan district, those uses may avoid developing other sites in the City that have more conflicts with incompatible uses.

SOCIAL CONSEQUENCES OF LIMITING CONFLICTING USES

The following is a discussion of the social consequences of limiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

All types of development would require some level of ground disturbance as described above. Any limitations to these ground disturbance activities will help to protect the integrity of cultural resource sites. Where possible, cultural resource sites should be avoided through placement of development impacts elsewhere on a particular development site.

Consequences on the Resource

Heritage and Scientific Values. The Columbia South Shore, including the Columbia Slough and nearby natural resources, are remnants of a vast and complex series of waterways and wildlife habitat areas of the Columbia River floodplain. Full protection of cultural resources preserves their associated heritage and scientific values as described earlier. These cultural resources, and their associated heritage values, are an integral part of the lives of contemporary American Indian peoples, and are central to the preservation of Tribal communities and associated lifeways -- in essence, their heritage. The historical and spiritual connection between living American Indian peoples and their ancestors is communicated through their connection with the land. In sustaining and preserving their lifeways, American Indians look back seven generations and look ahead seven generations for guiding their use of the land. The land provides physical and spiritual sustenance as well as a connection to the past. Each of these elements is enhanced by the existence of cultural sites and their environmental context. Without a connection to the past, American Indian descendants would lose a vital part of their social fabric and, therefore, their identity as a distinct and valuable culture.

Limiting conflicting uses such that they do not disturb cultural resource sites would retain important heritage and scientific values attached, thereby providing benefits to the Portland community and the region as a whole.

Recreational and Educational Opportunities. Limited protection of cultural resources benefits tribal ancestors and the greater community by providing recreational and educational opportunities. First, each identified cultural resource site represents a unique educational opportunity for tribal ancestors who rely on hands-on experience and oral traditions to impart the knowledge of important community lifeways to future generations. Tribal representatives have indicated a desire for access to archaeological sensitivity areas for tribal ceremonies and training of their youth. Limiting conflicting uses could promote this use.

In addition, the Columbia Slough Trail could incorporate interpretative signs that convey the importance of these practices to the maintenance of tribal heritage and identity -- in essence, cultural stability. If used in this manner, the trail could help build an on-going dialog between area residents, businesses, American Indians (some of whom are City residents and business people) and tourists. This dialog could promote recognition and acceptance of differences between cultures with the goal of increasing tolerance and respect for these differences. In addition, cross-cultural exchange between developers, tribal representatives and local jurisdictions will foster consensus building and creative solutions to problems encountered during the development process. As such,

this exchange will help reduce litigation and, therefore, development time and cost.

Visual Variety and Impact. The Columbia South Shore consists of low-lying, gently rolling terrain containing typical floodplain features such as sloughs, ponds, small lakes and marshes. Limited protection of cultural resources could promote the integration of cultural resources into proposed developments and preserve some variety in landscape form. Limited protection through designation of open space or conservation easements could enhance other identified scenic and natural resource values located within the Columbia South Shore plan district (e.g., Marine Drive and the Columbia Slough trail). On a smaller scale, the riparian strip along the Columbia Slough provides a strong sense of orientation, and an edge or seam between sub-areas and land uses. Furthermore, where there is some protection, the area could receive landscape treatments such as planting native flowers, trees or shrubs, depending on the locational context of each cultural resource site.

Urban Design and Image of the City. Mountain and river views are well-established amenities for commercial and residential developments, adding to market demand and creating a desirable work environment. Limited protection of cultural resource sites in the Columbia South Shore can increase the value of such amenities by further enhancing the City's sense of definition, location and uniqueness. This reinforces Portland's image as a livable city that promotes and protects cultural diversity. It will also tie Columbia South Shore to other areas along the middle Columbia River basin that experienced early contact between American Indians and Euro-Americans.

Screening and Buffering of Incompatible Uses. Archaeological sensitivity areas can act as an edge to different land uses, separating and buffering them from each other by both distance and visually, reducing the potential for conflicts. Limited protection of cultural resources in the Columbia South Shore would allow some development, while protecting the highest quality resources. However, even limited development would involve significant alteration of some portions of a development site of land, thereby possibly impacting a cultural resource site. In some cases, protected cultural resource sites could be avoided through clustering of development on less significant portions of the development site, which could still provide screening and buffering functions.

Consequences on the Conflicting Use

Recreational Opportunities. Limiting such recreational uses as the Columbia Slough trail would diminish established amenities for commercial and residential developments.

Urban Design and Visual Variety. Limiting uses provides opportunities for businesses and industry to alter traditional development standards. For example, affected conflicting uses could design for shared driveways, more pedestrian opportunities and clustered development patterns so as to avoid significant cultural resource sites. Such design changes might enhance the building-scape, while also maintaining the integrity of cultural resource sites. Clustered development patterns typically are more possible with commercial and residential uses than with industrial uses.

Screening and Buffering of Incompatible Uses. By limiting industrial and commercial uses in the Columbia South Shore, such uses may choose to locate where closer proximity to residential uses may lead to more land use conflicts.

SOCIAL CONSEQUENCES OF PROHIBITING CONFLICTING USE

The following is a discussion of the social consequences of prohibiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

All types of development would require some level of ground disturbance as described above. Prohibiting a conflicting use from creating these ground disturbance activities will help to protect the integrity of cultural resource sites. Where possible, cultural resource sites should be avoided through placement of development impacts elsewhere on a particular development site.

Consequences on the Resource

Heritage and Scientific Values. The Columbia South Shore, including the Columbia Slough and nearby natural resources, are remnants of a vast and complex series of waterways and wildlife habitat areas of the Columbia River floodplain. Full protection of cultural resources preserves their associated heritage and scientific values as described earlier. These cultural resources, and their associated heritage values, are an integral part of the lives of contemporary American Indian peoples, and are central to the preservation of Tribal communities and associated lifeways -- in essence, their heritage. The historical and spiritual connection between living American Indian peoples and their ancestors is communicated through their connection with the land.

In sustaining and preserving their lifeways, American Indians look back seven generations and look ahead seven generations for guiding their use of the land. The land provides physical and spiritual sustenance as well as a connection to the past. Each of these elements is enhanced by the existence of cultural sites and their environmental context. Without a connection to the past, American Indian descendants would lose a vital part of their social fabric and, therefore, their identity as a distinct and valuable culture.

American Indian descendants highly value hunting, fishing, digging roots, gathering native plants for medicinal uses and picking berries. Each activity is viewed as essential to maintain cultural identity and continuity. They form the basis for the unique aspects of traditional culture and as such are revered. Protection of cultural resource sites protects significant heritage and scientific values.

Recreational and Educational Opportunities. Full protection of cultural resources benefits tribal ancestors and the greater community by providing recreational and educational opportunities. Each identified cultural resource site represents a unique educational opportunity for tribal ancestors who rely on hands-on experience and oral traditions to impart the knowledge of important community lifeways to future generations. Tribal representatives have indicated a desire for access to archaeological sensitivity areas for tribal ceremonies and training of their youth. Protection of cultural resource sites would promote this use.

In addition, the Columbia Slough Trail could incorporate interpretative signs that convey the importance of these practices to the maintenance of tribal heritage and identity -- in essence, cultural stability. If used in this manner, the trail could help build an on-going dialog between area residents, businesses, American Indians (some of whom are City residents and business people) and tourists. This dialog could promote recognition and acceptance of differences

between cultures with the goal of increasing tolerance and respect for these differences. In addition, cross-cultural exchange between developers, tribal representatives and local jurisdictions will foster consensus building and creative solutions to problems encountered during the development process. As such, this exchange will help reduce litigation and, therefore, development time and cost.

Visual Variety and Impact. The Columbia South Shore consists of low-lying, gently rolling terrain containing typical floodplain features such as sloughs, ponds, small lakes and marshes. Full protection of cultural resources will provide variety in landscape form while enhancing other identified scenic and natural resource values located within the Columbia South Shore plan district (e.g., Marine Drive and the Columbia Slough trail). On a smaller scale, the riparian strip along the Columbia Slough provides a strong sense of orientation, and an edge or seam between sub-areas and land uses. Furthermore, where there is full protection, the area could receive landscape treatments such as planting native flowers, trees or shrubs, depending on the locational context of each cultural resource site.

Urban Design and Image of the City. Mountain and river views are well-established amenities for commercial and residential developments, adding to market demand and creating a desirable work environment. Full protection of cultural resource sites in the Columbia South Shore can increase the value of such amenities by further enhancing the City's sense of definition, location and uniqueness. This reinforces Portland's image as a livable city that promotes and protects cultural diversity. It will also tie Columbia South Shore to other areas along the middle Columbia River basin that experienced early contact between American Indians and Euro-Americans.

Screening and Buffering of Incompatible Uses. Archaeological sensitivity areas can act as an edge to different land uses, separating and buffering them from each other by both distance and visually, reducing the potential for conflicts.

Consequences on the Conflicting Use

Recreational Opportunities. Prohibition of such recreational uses as the Columbia Slough trail would diminish established amenities for commercial and residential developments.

Urban Design. Prohibiting uses provides opportunities for businesses and industry to alter traditional development standards. For example, affected conflicting uses could design for shared driveways, more pedestrian

opportunities and clustered development patterns so as to avoid significant cultural resource sites.

Screening and Buffering of Incompatible Uses. By prohibiting industrial and commercial uses in the Columbia South Shore, such uses may choose to locate where closer proximity to residential uses may lead to more land use conflicts.

Table 7: Summary of General Social Consequences

Consequences on the Resource by Functional Resource Value

Functional Resource Values	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Heritage and Scientific Values	Negative	Positive	Strongly Positive
Recreational and Educational Opportunities	Negative	Positive	Positive
Visual Variety and Impact	Negative	Positive	Positive
Urban Design and Image of the City	Negative	Positive	Positive
Screening and Buffering of Incompatible Uses	Negative	Positive	Positive

Consequences on Conflicting Uses by Functional Resource Value

Functional Resource Values	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Heritage and Scientific Values	Negative	Positive	Positive
Recreational and Educational Opportunities	Negative	Positive	Positive
Visual Variety and Impact	Negative	Positive	Positive
Urban Design and Image of the City	Negative	Positive	Positive
Screening and Buffering of Incompatible Uses	Positive	Positive	Negative

Net consequences	Negative	Positive	Positive
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SOCIAL RECOMMENDATIONS

Archaeological resources have been found throughout the Columbia South Shore, particularly along the edges of historic wetlands and water bodies. Industrial and commercial development results in re-grading and excavating the land, possibly exposing or destroying artifacts. Protection of cultural resources in the Columbia South Shore will result in generally positive social benefits in terms of preservation of heritage and scientific values, increased protection from incompatible land uses, increased sense of place, uniqueness, visual diversity and aesthetics, and greater education and recreation opportunities. Beneficiaries of these resource values include the associated tribal communities, the archaeological community, residents and businesses throughout the Portland metropolitan area and the broader scientific community.

ENVIRONMENTAL ANALYSIS

GENERAL BACKGROUND/Framework

As stated earlier, the Columbia South Shore is a mosaic of vegetative communities, sloughs and wetlands. Through the acknowledged *Natural Resources Protection Plan for Columbia South Shore* (October 1993), a number of these natural resources were determined significant enough to receive full or partial protection. Protection of cultural resource values can enhance the protection of natural resources associated with a particular archaeological resource site or sensitivity area. This analysis considers the environmental consequences of prohibiting, limiting or allowing conflicting uses within the three archaeological sensitivity areas located in the Columbia South Shore. Environmental consequences considered in this analysis include effects on fish and wildlife habitat, water quality and quantity and air quality.

Water Quality and Quantity. Natural resources, including upland vegetation, riparian fringes, wetlands, and sloughs and drainageways provide major contributions toward improving water quantity and quality. Soils allow water to filter downward to the ground water reservoir, adding volume to surface waters during low flow periods. Ground water recharge in turn reduces surface runoff, and accompanying erosive forces. Other areas allow ground water discharge in the form of springs or seeps, providing water sources for surface water drainageways. Wetlands, water bodies, and other lowlands provide flood storage and desynchronization, reducing overall flood levels. Vegetation traps sediment from surface flow and provides soil anchoring, as well as absorption of

certain hazardous chemicals and heavy metals, reducing water pollution. Additionally, erosive forces from water flow are dissipated by vegetation, allowing deposition of suspended solids and increasing bank stabilization, both of which increase water quality.

Development which removes the natural resources of the Columbia South Shore will result in higher water temperatures, destroying fish and water-related

wildlife habitat. It reduces ground water recharge and increases immediate storm water runoff, exacerbating flood levels, contributing to more erosion, carrying pollutants directly to the slough, and reducing overall water quality.

Protection of cultural resource sites (and their accompanying natural resource elements) will help stabilize flood flows by retaining open space and allowing ground water recharge. This action will allow continued water supply for summer flow. A continued ground water source will also help keep the water temperatures of the slough down, as will shading of the slough and lakes by bank vegetation. Riparian vegetation and wetlands adjacent to the slough traps sediment and other pollutants from sheet flow, aiding in overall water quality. Limiting storm water outfalls and sheet runoff from developed lands through the use of on-site retention facilities reduces point and non-point sources of pollution. Prevention of direct runoff also provides for filtering of certain pollutants as water percolates through the soil, rather than flowing directly to the slough.

Fish and Wildlife Habitat. The Columbia Slough is a mosaic of vegetative communities and human uses integrated with the water course ecosystem. The slough provides food, shelter, breeding and rearing areas for aquatic and terrestrial animals and birds. Fish and wildlife need food, water, cover, and places to perch, rest, breed, and nest. Any changes in these requirements, whether man-induced (development, channelization, removal of vegetation) or natural (flooding, windstorms, drought or insect infestations), will affect fish and wildlife habitats. The changes may benefit some wildlife species and harm others. Changes and losses in the quality, quantity and availability of food, water, cover and living space have the greatest detrimental effects on wildlife.

The most important aspect of habitat and habitat protection within the Columbia Slough basin is water. Water exists in the form of sloughs, lakes, ponds, wetlands, or ground water. A review of the impacts on water resources in the basin from conflicting uses provides justification for protecting the two other basic habitat components: food and cover. For example, the removal of vegetative cover affects water quality by increasing erosion and silting. Increased siltation affects the turbidity level of the water and the ability of fish to spawn. Removal of vegetation causes warming of the creek. High summer

water temperatures is the major factor limiting fish diversity in the Columbia Slough. The removal of vegetation reduces nesting cavities and shelter for birds and insects. A reduction in insects causes a decrease in the bird and small mammal populations.

Throughout the Columbia South Shore there are wetlands. These are valued because of their rarity and great plant and animal diversity common to wetlands. Wetlands and undeveloped uplands provide permeable soils for ground water

recharge, flood storage, and traps to prevent sediment from entering the creeks. Maintaining areas for ground water and flood storage help reduce peak flooding which in turn helps decrease the amount of habitat and personal damage destroyed annually by flooding.

Plants provide food and cover for fish and wildlife. Their roots, bark, foliage, nuts and fruits provide food for a variety of wildlife species. Twigs, leaves, and bark are used for nest building and insulation. Large trees, especially snags, are prime perch sites for hawks and owls which feed on small mammals on the ground below. Because plants are at the bottom of the food chain, they are a crucial element of the entire system. Algae in waterways is eaten by tiny macro-invertebrates, which are in turn eaten by fish which may be eaten by herons, kingfishers or other birds. On land, crickets, beetles, small mammals, and rabbits feed on vegetation and, in turn, provide food for coyotes and raptors.

When vegetation begins to die and decay, it becomes home and food to mites, earthworms, fungi and millipedes which aid in the decomposition process. Hollow trees laying on the ground provide cover for rabbits and raccoons, salamanders and snakes. Tree trunks lying partially submerged in a slough or pond provide cover and shading for fish, attachment sites for aquatic insects, sunning areas for western pond turtles, snakes and other insects (dragonflies).

The vegetative cover and waterways provide travel corridors for the fish and animals. Safe access to and along the waterways is crucial. Even in the reaches where there is little vegetation and exposure to summer heat is high, the slough serves to connect habitats and as a passageway between habitats. Protection of archaeological sensitivity areas located on or adjacent to the slough or Columbia River will further protect the natural resources values provided by riparian systems.

Water is the other component required by wildlife species. Safe access to a clean water source is crucial, such as a healthy riparian system providing connectivity between upland habitats and a water supply.

Urbanization and development have greatly impacted the state and health of the aquatic, riparian and upland habitats of the Columbia Slough. Some habitat has been destroyed and others created. As these changes occur, only the more aggressive and adaptive species survive, resulting in a loss of biodiversity.

The following general characteristics provide good overall fish and wildlife habitat:

- Native plant communities and landscapes;
- Convenient access to water, food, and cover for wildlife;
- Spawning and breeding areas for fish and wildlife;
- Presence of an adequate pool-to-riffle ratio for sufficient oxygenation of water;
- Insects, worms, and other small organisms which provide food for birds, fish, and small mammals;
- Connections between natural resources to provide for interspersions of plants and animals to provide recharge of populations and to enhance and increase wildlife diversity;
- Continuity of slough, riparian fringe, and adjacent uplands as a wildlife corridor; and
- Perching sites for raptors and other birds.

Air Quality. Vegetation traps and collects particulates which are then deposited on the ground with rainfall. Leaves also absorb carbon dioxide during photosynthesis. Removal of vegetation would result in increased air pollutants. Protection of cultural resources will reduce the amount of vegetation removed from the plan district because development activities will be reduced.

ENVIRONMENTAL CONSEQUENCES OF ALLOWING CONFLICTING USES

The following is a discussion of the environmental consequences of allowing identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

The Columbia South Shore plan district contains a wide variety of native vegetation and wildlife that was once common along the Lower Columbia River. These important environmental features form the basis for unique aspects of

traditional American Indian culture and as such are considered revered. Failure to protect the cultural resource sites from development and associated ground disturbance activities will result in continued alteration of natural landforms and native plant communities in the Columbia South Shore, thereby destroying or degrading important heritage values associated with natural resources.

Loss of identified cultural resource sites would also diminish or degrade natural resource values attached to a particular site, including water quality, fish and wildlife habitat and air quality.

Consequences on the Conflicting Use

Loss of identified cultural resource sites would diminish or degrade natural resource values attached to a particular site. This has negative consequences for a conflicting use. For example, undeveloped uplands provide permeable soils for ground water recharge, flood storage and traps to prevent sediment from entering the creeks. Cultural resource sites can be relied on to provide these functions, thereby reducing conflicting uses' need to provide these functions artificially to offset environmental impacts associated with site development.

ENVIRONMENTAL CONSEQUENCES OF LIMITING CONFLICTING USES

The following is a discussion of the environmental consequences of limiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

The vegetative cover and waterways provide travel corridors for the fish and animals. Safe access to and along the waterways is crucial. Even in the reaches where there is little vegetation and exposure to summer heat is high, the slough serves to connect habitats and as a passageway between habitats. Wetlands and undeveloped uplands provide permeable soils for ground water recharge, flood storage, and traps to prevent sediment from entering the creeks. Maintaining areas for ground water and flood storage help reduce peak flooding which in turn helps decrease the amount of habitat and personal damage destroyed annually by flooding.

Where these natural resource values overlap with cultural resource sites, limiting ground disturbance activities in cultural resource sites will result in the greater protection of the natural resource values, which in turn protect heritage values.

Natural resource values are an important social component to American Indian culture, as described earlier.

Consequences on the Conflicting Use

Throughout the Columbia South Shore there are wetlands. These are valued because of their rarity and great plant and animal diversity common to wetlands. Wetlands and undeveloped uplands provide permeable soils for ground water recharge, flood storage, and traps to prevent sediment from entering the creeks.

Maintaining areas for ground water and flood storage help reduce peak flooding which in turn helps decrease the amount of habitat and personal damage destroyed annually by flooding.

For example, undeveloped uplands provide permeable soils for ground water recharge, flood storage and traps to prevent sediment from entering the creeks. Cultural resource sites can be relied on to provide these functions, thereby reducing conflicting uses' need to provide these functions artificially to offset environmental impacts associated with site development.

ENVIRONMENTAL CONSEQUENCES OF PROHIBITING CONFLICTING USES

The following is a discussion of the environmental consequences of prohibiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

The vegetative cover and waterways provide travel corridors for the fish and animals. Safe access to and along the waterways is crucial. Even in the reaches where there is little vegetation and exposure to summer heat is high, the slough serves to connect habitats and as a passageway between habitats. Wetlands and undeveloped uplands provide permeable soils for ground water recharge, flood storage, and traps to prevent sediment from entering the creeks. Maintaining areas for ground water and flood storage help reduce peak flooding which in turn helps decrease the amount of habitat and personal damage destroyed annually by flooding.

Where these natural resource values overlap with cultural resource sites, limiting ground disturbance activities in cultural resource sites will result in the greater protection of the natural resource values, which in turn protect heritage values.

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Consequences on the Conflicting Use

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Table 8: Summary of General Environmental Consequences

Consequences on the Resource by Functional Resource Value

Functional Resource Values	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Water Quality and Quantity	Negative	Positive	Positive
Fish and Wildlife	Negative	Positive	Positive
Air and water pollution	Negative	Positive	Positive

Consequences on the Conflicting Uses by Functional Resource Value

Functional Resource Values	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Water Quality and Quantity	Negative	Neutral*	Positive
Fish and Wildlife	Negative	Neutral	Positive
Air and water pollution	Negative	Neutral	Positive

Net consequences	Negative	Positive	Positive
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* Neutral denotes that both positive and negative consequences can be associated with a decision, hence balancing the effects on resource values.

ENVIRONMENTAL RECOMMENDATIONS

Through the acknowledged *Natural Resources Protection Plan for Columbia South Shore* (October 1993), a number of these natural resources were determined significant enough to receive full or partial protection. Protection of cultural resource values can enhance the protection of natural resources associated with a particular archaeological resource site or sensitivity area. Thus, prohibiting conflicting uses where there are natural resource values is compatible with and supportive of protecting the natural environment in the Columbia South Shore.

ENERGY ANALYSIS

GENERAL BACKGROUND/Framework

Decisions on resource protection will have impacts on city form. Development densities may have to be altered to take into account resource protection. Development form and location will, in turn, impact energy consumption in both construction and ongoing maintenance of human uses and activities. This analysis considers the energy consequences of prohibiting, limiting or allowing conflicting uses within the three archaeological sensitivity areas identified in the Columbia South Shore. Energy consequences considered in this analysis include effects on transportation, urbanization and infrastructure and services.

Heating and Cooling of Structures. Energy consumption (heating and cooling structures) as a result of resource protection is impacted in two ways: building form and presence of vegetation. If resource sites are protected from development, that same development has to occur elsewhere.

Some argue that increased development restrictions will reduce the development potential in the Columbia South Shore and, therefore, increase development costs in a way that will force business to locate elsewhere in areas more distance from the city and the airport. Furthermore, needed development could be provided for by expanding the Urban Growth Boundary and using the same building form, which would result in no change in energy consumption for heating or cooling.

A 1989 report entitled, *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (pages 127-134) identifies a regional surplus of developable industrial-zoned land in the Columbia South Shore. The report concludes that the need for industrial land in the metropolitan area by the year 2005 is about 5,192 acres. In addition, about 19,070 acres of vacant, suitable land exist within the metropolitan urban growth boundary, and of this amount

approximately 10,483 acres is vacant, uncommitted and without development constraints.

In addition, there are about 9,700 acres of vacant industrial land within Multnomah County and, according to a 1989 publication by the Bureau of Planning entitled, *1987 Vacant Land Report*, approximately 5,731 acres of vacant industrial land exists within the City of Portland. This suggests that alternative industrial and employment sites are available in the Columbia Corridor (and the plan district) such that expansion of the urban growth boundary for purposes of increasing the amount of buildable land suitable for industrial and commercial uses is unnecessary.

Vegetation provides a moderating effect on climate, both on a macro and micro scale. Trees provide shade on nearby buildings in the summer, reducing energy demands for cooling. Plants also absorb sunlight and transpire during growing seasons, reducing ambient air temperatures. This moderating effect can reduce energy needs for cooling of nearby development. Trees and shrubbery can also act as a wind break during winter. By slowing or diverting winter winds, heat loss in structures from infiltration and convection is reduced, resulting in lower energy needs.

Transportation. Energy expenditures for transportation relate primarily to travel distance from origin to destination, and mode of transportation used. Both variables can be affected by cultural resource protection efforts. If resource protection precluded future needed industrial development, and it were not able to locate nearby, people may have to use more energy for traveling between home and employment or shopping.

The availability of cultural resources within the Columbia South Shore provides opportunities for recreation and education and encourages nearby residents to explore their community's history. Because resources are closer to users, less transportation energy is used to access them.

When the 40-Mile Loop, Columbia Slough Trail, and bicycle path along Airport Way and north-south connections are completed, a greater range of transportation modes, including bicycling and walking, can be used to reach and use the corridor. Separation of pedestrian and bicycle routes from roadways may increase safety, and therefore make alternative forms of transportation more attractive. Proximity to cultural resources along the slough may also make travel more educational if somehow incorporated in this experience by interpretative signs.

Infrastructure. Clustering development outside of cultural resource sites in an efficient manner will result in less infrastructure needed to serve sewer, water, transportation and other needs. The result would be less infrastructure materials and maintenance, of which a major component is energy. Existing infrastructure is not adequate to support future development slated for the Columbia South Shore. Any new development will require secondary infrastructure construction which will increase energy expenditures.

ENERGY CONSEQUENCES OF ALLOWING CONFLICTING USES

The following is a discussion of the energy consequences of allowing identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

There are no identifiable energy effects on the resource if a conflicting use is allowed.

Consequences on the Conflicting Use

Transportation and Infrastructure. Sensitivity areas are generally located away from the Airport Way spine, in the eastern portion of the Columbia South Shore plan district. By allowing conflicting uses in these areas, the uses would have to construct secondary roads in order to access primary road systems and connected air terminal facilities, rail lines and interstates. EG zoning allows commercial uses, which put a heavier peak demand on the existing transportation network than do industrial uses. Thus, allowing conflicting uses would push transportation capacity to its limits during peak hours.

ENERGY CONSEQUENCES OF LIMITING CONFLICTING USES

The following is a discussion of the energy consequences of limiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

There are no identifiable energy effects on the resource if a conflicting use is limited.

Consequences on the Conflicting Use

Heating and Cooling of Structures. Alternative development forms and landscape treatments are available for a particular use to locate on a given site, if it is desirable or necessary to locate the development on or near the same development site as the cultural resource site. Except where limited due to land configuration, existing development or limitations in manufacturing techniques, this could be

accomplished through clustering of buildings. The result would be more common wall construction and reduced surface area for a given volume. Heat transfer between indoors and outdoors would be reduced, resulting in an energy savings, which translates to increased cost savings for the conflicting use.

Transportation and Infrastructure. Existing infrastructure is not adequate to support future development slated for the Columbia South Shore. Any new development will require secondary infrastructure construction, which will increase energy expenditures. Clustering development outside of cultural resource sites in an efficient manner will result in less infrastructure needed to serve sewer, water, transportation and other needs. The result would be less infrastructure materials and maintenance, of which a major component is energy.

ENERGY CONSEQUENCES OF PROHIBITING CONFLICTING USES

The following is a discussion of the energy consequences of prohibiting identified conflicting uses in the Columbia South Shore plan district. This analysis is based on information presented above. Consequences on both the resource and conflicting uses are discussed based on functional categories identified above.

Consequences on the Resource

Transportation and Infrastructure. The availability of cultural resources within the Columbia South Shore provides opportunities for recreation and education and encourages nearby residents to explore their own community history rather than travel elsewhere. Because resources are closer to users, less transportation energy is used to access them.

Consequences on the Conflicting Use

Heating and Cooling of Structures. Energy needs for heating or cooling would generally be positively impacted as a result of resource protection. A positive impact would result from clustering, as development surrounding the resource would continue to benefit from resource vegetation. A positive impact would

result from wind protection and summer shading on nearby development whether the urban area were expanded to allow for needed development, or increased densities were encouraged on nearby sites. The extent of energy saving is dependent on many factors beyond the scope of this report, including type of resource protected, proximity of resource to development, structure type, heating source, construction materials, design and activities.

Transportation. Most archaeological sites are limited in size. The impact of resource protection on transportation energy costs depend upon where needed potential land uses displaced by protected resources will relocate. If increased land use densities are allowed nearby to offset protected areas, or if uses are located more closely to employment centers, a net positive benefit from protection should result. If the Urban Growth Boundaries were expanded to allow development far from employment, commercial, and recreation destinations to compensate for lost development opportunities, more energy would be required for commuting. Protection of cultural resources will also encourage the use of energy-efficient travel, such as bicycling and walking, by enhancing routes for these modes.

Infrastructure. Existing infrastructure is not adequate to support future development slated for the Columbia South Shore. Any new development will require secondary infrastructure construction which will increase energy expenditures. Clustering development outside of cultural resource sites in an efficient manner will result in less infrastructure needed to serve sewer, water, transportation and other needs. The result would be less infrastructure materials and maintenance, of which a major component is energy.

Table 9: Summary of General Energy Consequences

Consequences on the Resource by Functional Resource Value			
Energy Functional Resource Values	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Heating and Cooling of Structures	None	None	None
Transportation	None	None	Positive
Infrastructure	None	None	Positive

Consequences on the Conflicting Uses by Functional Resource Value

Energy Functional Resource Values	Consequences of Allowing Conflicting Uses	Consequences of Limiting Conflicting Uses	Consequences of Prohibiting Conflicting Uses
Heating and Cooling of Structures	Neutral*	Positive	Positive
Transportation	Negative	Neutral	Positive
Infrastructure	Negative	Positive	Positive

Net consequences	Negative	Positive	Positive
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* Neutral denotes that both positive and negative consequences can be associated with a decision, hence balancing the effects on resource values.

ENERGY RECOMMENDATIONS

Considerable energy savings can be achieved through cultural resource protection, particularly in terms of infrastructure provision and heating and cooling of structures. Transportation-related savings can also be substantial if needed development were located near destination points and alternative energy-efficient travel modes were integrated into the cultural resource protection plan. Beneficiaries of these energy resource values include residents and businesses throughout the Portland metropolitan area.

SITE SPECIFIC ESEE ANALYSIS (BY SENSITIVITY AREAS)

The previous analyses considered general ESEE consequences common to all inventoried sites, both to the resource and to existing or potential land uses throughout the Columbia South Shore plan district. The next section provides a discussion of site-specific ESEE consequences for each of the three sensitivity areas identified in the Goal 5 archaeological resources inventory (Chapter 8).

The combination of these general and site-specific consequences is used to resolve conflicts between archaeological resource protection and other urban development. The conflict resolution is then used to arrive at conclusions regarding the level of resource protection needed for each identified archaeological sensitivity area. Where possible, individual archaeological resources within archaeological sensitivity areas are evaluated. The conclusion provides the reasons to explain why decisions are made with regard to archaeological resource protection for inventoried sites in the Columbia South Shore.

SENSITIVITY AREA #1: THE HISTORIC LAKES

Economic, Social, Environmental and Energy Consequences

This section analyzes the consequences of protecting significant archaeological resources in Sensitivity Area 1 (Historic Lakes), and the consequences of allowing these resources to be degraded or destroyed. The analysis addresses four types of consequences: economic, social, environmental and energy. The general ESEE analyses found earlier in this chapter also apply to this sensitivity area, and are sharpened with this site analysis.

The Historic Lakes contains the following zoning categories: General Industrial (IG2), General Industrial zoning with Mixed Employment Comprehensive Plan Map designation, and General Employment (EG2). Environmental overlay zones also apply to many of the properties within the sensitivity area, including the more restrictive environmental protection ("p") zone. As stated in the conflicting use analysis, the "p" zoned areas and building setback areas limit potential conflicting uses.

As described in the inventory section (Chapter 8), this site contained a direct slough connection to the Columbia River, two large lakes surrounded by marsh/meadow areas, and open woodlands. Within a short distance of relatively high, open ground (grasslands), there was a diversity of productive habitats (riverine, riparian, lacustrine/palustrine, grasslands and brush). The diversity of habitat types suggests a broad range of house-building materials and food sources were available in close proximity. Watercourses (the slough system and Columbia River) connected the resource site with other habitat areas downstream of the Columbia Slough and to points up and down the Columbia River. Heritage and scientific values are supported throughout the Historic Lakes.

Of the three Goal 5 sensitivity areas, the Historic Lakes has received the most archaeological testing in terms of participating properties and extent of testing detail. As shown on Figure 9 of this report, all vacant properties in the Historic Lakes have been tested. For purposes of this analysis, no further confirmation testing is needed in Sensitivity Area 1. Further testing may be warranted for ground disturbance activities that alter, remove or destroy an archaeological site, and a state archaeological permit may be needed.

As a result of archaeological studies through 2003, the City's consultant (Heritage Research Associates, or HRA), concluded that the Historic Lakes contained seven archaeological sites of potential National Register status, a nationally-recognized measure of relative archaeological significance. Another four archaeological sites have been recorded within that area, but HRA does not consider these sites as

significant. Of the seven "potentially significant" sites, one site was recorded and destroyed. The property owner repatriated the archaeological materials to the associated tribe.

Among the "significant" or "potentially significant" resource sites, six sites are seasonal campsites/task-specific activity areas and one site is a residential site/activity area. American Indian peoples may have been attracted to the Historic Lakes for ease of access to the Columbia River (using the Columbia Slough travel route), and the apparent abundance of subsistence resources in and around Duck Lake and Egg Lake. Based on consultation with tribes, an additional cultural resource classification, traditional, sacred or cultural use sites, was created. The city continues to consult with tribes for information on this resource classification. No cultural resources in the Historic Lakes have been classified as traditional or sacred use sites, although the possibility exists that this type of resource could be discovered during future confirmation testing. Burial sites may also exist within the Historic Lakes, although no human remains have been reported to date in this area.

The confirmed archaeological sites have been recorded at depths of between 30 centimeters (1-foot) and 200 centimeters (just over 6 - 1/2 feet). This vertical band of recorded archaeological material should not be construed as fully representative of all archaeological sites that may exist in Sensitivity Area 1. However, confirmation testing, combined with appropriate management of confirmed archaeological sites, serves to reduce the likelihood that an archaeological site is encountered by ground disturbance activities.

Auger testing provides only a sample of subsurface conditions, both horizontally and vertically throughout the sensitivity area. For instance, the typical horizontal spacing between auger probes is 30 meters (approximately 100 feet), although some probes were doubled up in certain locations. In addition, the hand-held auger probes most often used in this area do not extend beyond 8 feet in depth. Therefore, the range of recorded depths may elude some archaeological sites.

ECONOMIC CONSEQUENCES

This analysis considers the economic consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 1. The analysis takes into account several points.

First, there is a higher level of certainty about site locations here than in the two other sensitivity areas. In relative terms, the site boundaries are well-established. No further confirmation testing is recommended in Sensitivity Area 1.

Second, because no further confirmation testing is recommended, the upfront cost to an owner or prospective developer is reduced relative to other parcels where confirmation testing is needed. An owner has access to confidential archaeological site records at minimal cost. Sources for that information include the State Historic Preservation Office (SHPO), the Portland Bureau of Planning and qualified archaeologists. The SHPO archaeologist keeps the official site records for the state of Oregon. The Bureau of Planning holds a copy of the areawide archaeological inventory and individual investigations that have been submitted in the interim before this plan is adopted. Qualified archaeologists maintain archaeological reports and data from investigations, and can access SHPO records directly. The owner should expect to show evidence of current ownership and be prepared to sign a nondisclosure agreement, to verify the owner's intent and discourage the looting or destruction of archaeological sites.

Third, confirmation testing through the City's areawide inventory has resulted in redrawing previously-recorded site boundaries or redefining the potential significance of an archaeological site on the basis of limited subsurface testing. In some cases, new site boundaries are smaller than the original site boundaries. For example, Site #35 MU 79 dropped in size from approximately three acres to one-tenth of an acre. Not all sites experienced this drastic shrinkage, though, and the potential exists for enlarging old site boundaries or even discovering a new archaeological site. Either way, confirmation testing serves to give a more accurate picture of the presence of archaeological resources on a given property.

Fourth, confirmation testing may help to define what Indian use pattern the archaeological site represents. For purposes of this plan, sites are classified into burial sites, village sites and seasonal campsites/activity areas. By knowing the type of archaeological site, the owner will know better how to manage that resource.

Fifth, several confirmed archaeological sites in the Historic Lakes are entirely zoned for environmental protection ("p" zone) or environmental conservation ("c" zone). Three confirmed archaeological sites have the "p" zone, which provides a high level of protection and limits the potential conflicting uses. Another confirmed archaeological site falls entirely within the "c" zone which provides partial protection to archaeological sites by limiting conflicting uses. The "c" zone allows development with some limitations.

In summary, the Historic Lakes holds the majority of confirmed, potentially significant archaeological sites of the plan district. Of seven archaeological sites that are potentially significant, three sites have "p" zone protection and one site was recorded and destroyed. The four other sites include a site that is entirely zoned for environmental conservation ("c" zone).

A brief profile of the one "c" zoned site and one "unprotected" sites within Sensitivity Area 1 follows. To ensure confidentiality of the archaeological sites, affected development sites are not identified by owner or legal description. The Bureau of Planning has offered to show the results of the City's archaeological investigation to owners who provided access for the fieldwork.

35 MU 79

As described above, the City's areawide investigation resulted in new site boundaries for the archaeological site known as 35 MU 79. The 0.1-acre site lies entirely in a "c" zone, and is not close to streets identified in the *Airport Way Secondary Infrastructure Plan* (SIP). Archaeological materials have been identified at depths of 30 to 50 centimeters (approximately 1 foot to 2 - 1/2 feet). Therefore, the site is vulnerable to most ground disturbance activities.

35 MU 84

This 1.0-acre archaeological site is zoned IG2 and is not protected with the "p" zone. Based on the SIP, no secondary streets are planned in the vicinity of this archaeological site.

Full Protection of Significant Resources

Of the five intact, significant archaeological sites in the Historic Lakes, three are already fully or partially protected with an environmental zone. Full resource protection will not reduce the development potential or market value of the affected properties, but will ensure protection of significant archaeological resources. From the resource standpoint, full protection of an archaeological resource site within the Historic Lakes has incalculable economic value. Archaeological resource sites from the pre-contact period are irreplaceable. Their integrity is diminishing as historic use areas in the lower Columbia River basin are destroyed with development. The closest form of replacement value comes with detailed archaeological investigation and recording, and possible repatriation of archaeological materials to the appropriate tribe.

As stated earlier, full protection means completing archaeological "confirmation testing" for that development site; no ground disturbance of confirmed archaeological sites; and some level of protection for adjacent transition areas. It should be noted that no further confirmation testing is required within the Historic Lakes.

The two other archaeological sites, currently unprotected by City zoning, involve economic tradeoffs. In the case of 35 MU 84, full resource protection involves either followup archaeological testing (intensive, small area) or the design of a project to incorporate the archaeological site into required on-site landscaping.

Site 35 MU 84 is located near significant natural resources (zoned "p"), which adds to its heritage value. Full resource protection may ensure site protection rather than destruction. In short, full protection of 35 MU 84 has slightly negative effects on the conflicting use but strongly positive effects on the resource.

No Protection of Significant Resources

As stated earlier, no protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas.

With no archaeological resource protection, the three environmental zoned archaeological sites would still receive protection for natural resource values. The economic effect on the remaining four sites is to diminish open space and tourism-related benefits because the heritage information would be lost, and could not be used as a marketing tool by businesses and industries. For the conflicting use, no archaeological resource protection has neutral effects.

Limited (Partial) Protection of Significant Resources

As stated earlier, partial protection means completing archaeological "confirmation testing" for that development site; partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials; and some level of protection for adjacent transition areas. The environmental zoning that covers three archaeological sites in the Historic Lakes reflects a City policy decision to protect significant natural resource values. There are limited conflicting uses allowed in the environmental zones, and the economic benefits on the resource outweigh any economic benefits to conflicting uses.

For the currently unprotected site (35 MU 84), partial protection recognizes the need for a flexible approach to site management while retaining some resource values. Partial protection allows an applicant to place some ground disturbance activities near or over the archaeological site, which moderates the economic effects on conflicting uses. Both unprotected sites in the Historic Lakes are seasonal campsites or activity areas.

Economic Recommendations for the Historic Lakes

From an economic standpoint, full protection of archaeological sites with a "p" or "c" zone supports open space and tourism while presenting minimal economic effect on conflicting uses that are already limited by environmental zoning designations. For site 35 MU 84, partial protection will retain some resource-

related economic values while allowing development flexibility for conflicting uses.

SOCIAL CONSEQUENCES

This analysis considers the social consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 1 (the Historic Lakes). All intact archaeological sites in this area are described as seasonal campsites or activity areas.

Full Protection of Significant Resources

Full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. This action protects significant archaeological resources and associated heritage and scientific values identified in the site inventory. The social consequences on the resource are strongly positive. From the conflicting use standpoint, full protection has positive effects for adding to the quality of life for employees and providing an identity of place. Certain target industries and marketing plans are attracted by natural and recreational amenities as described in the general economic analysis earlier. Such attractions include the Columbia Slough and associated recreational trail system, which are found in the Historic Lakes.

No Protection of Significant Resources

As stated earlier, no protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. No protection results in the loss of significant archaeological resources and associated heritage and scientific values identified in the site inventory (Chapter 8). The social consequences on the resource are strongly negative. For conflicting uses, there is a loss of social connection to the work environment and associated open space.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. The limited (partial) protection option does not match the three sites already fully zoned for environmental protection or conservation. There are limited conflicting uses

allowed in the environmental zones, and the social benefits accrue to the resource and to conflicting uses.

For the unprotected site (35 MU 84), partial protection recognizes the need for a flexible approach to site management while retaining some resource values. Partial protection allows an applicant to place some ground disturbance activities near or over the archaeological site, given that both unprotected sites in the Historic Lakes are seasonal campsites or activity areas.

Social Recommendations for the Historic Lakes

The net social consequences of archaeological resource protection in the Historic Lakes are positive for the resource and for conflicting uses. All intact archaeological sites in this area benefit from full or limited protection. To fully protect heritage values, the owner or developer should consult with the associated tribes when intending to recover or remove archaeological materials. Federal and State statutes may also apply.

ENVIRONMENTAL CONSEQUENCES

This analysis considers the environmental consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 1 (Historic Lakes). As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. Finally, no protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas.

Full Protection of Significant Resources

This action protects significant environmental resources and associated resource values identified in the inventory by adding to protected natural areas in the sensitivity area. The environmental consequences are positive for the resource and for conflicting uses.

No Protection of Significant Resources

Failure to protect archaeological resource sites from conflicting uses and associated ground disturbance activities will result in continued alteration of native landforms and plant communities in the sensitivity area. As a result, important heritage values associated with natural resources may be destroyed or degraded.

In addition, no protection results in an opportunity cost of not extending resource protection boundaries adjacent to areas already zoned for environmental protection ("p") or environmental conservation ("c"). The environmental consequences are negative for the resource and for conflicting uses.

Limited (Partial) Protection of Significant Resources

Limited (partial) protection has neutral environmental consequences for the resource and conflicting uses.

Environmental Recommendations for the Historic Lakes

Fully protect significant archaeological resources, particularly those resource sites that overlap with and hold natural resource values.

ENERGY CONSEQUENCES

This analysis considers the energy consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 1 (Historic Lakes). The discussion involves the following topics: heating and cooling of structures, transportation and infrastructure. This analysis builds on a general energy analysis of these topics.

One design solution to reduce fuel consumption for heating and cooling of structures is to cluster buildings. Some industrial uses are better able to cluster buildings than are others, due to functional needs. Due to east winds that blow through the plan area, project engineers try to orient dock doors away from an eastern exposure.

Most development sites are expected to deliver goods by truck, using NE Airport Way and the interstate freeway connections. Most development sites in Sensitivity Area 1 are located along or close to the Airport Way spine. The construction of secondary roads and related utility extensions needed to serve the affected development sites will consume relatively less energy than will street and utility construction to serve developments sites affected by the two other sensitivity areas. Most unbuilt development sites with Airport Way frontage are not affected by this plan.

Full Protection of Significant Resources

As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. Energy consequences are generally positive for the conflicting use and neutral for the resource, though potentially negative if certain uses are forced to locate outside the Urban Growth Boundary (UGB).

No Protection of Significant Resources

No protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. No protection may lead to lost opportunities to save energy through the retention of vegetation and clustering of buildings. The energy effects of this loss are negative for the conflicting use and neutral for the resource.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. This action has generally positive energy consequences because alternative development forms and landscape treatments are available for a particular use to locate on a given site, if it is necessary to locate the development on or near a archaeological resource site.

Energy Recommendations for the Historic Lakes

Fully protect significant resources, except where allowed uses are pushed outside established urban areas or street access becomes unfeasible to a platted parcel. Energy consequences are generally positive, though potentially negative if certain uses are forced outside the Urban Growth Boundary.

Figure 18: Conflict Resolution Summary Table for the Historic Lakes Sensitivity Area

Recommended Level of Protection Based on ESEE Factors						
Goal 5 Sensitivity Area	Location	Economic	Social	Environmental	Energy	Decision
Area 1: Historic Lakes	Areas within environmental protection ("p") zone	Full	Full	Full	Full	Full ¹
	Areas within conservation ("c") zone	Partial	Full	Full	Full	Partial
	Site 35 MU 84	Partial	Full	Full	Full	Partial
	Site 35 MU 82	Partial	Full	Full	Full	Partial

¹ Areas with environmental protection, "p" zone" already receive full protection.

SENSITIVITY AREA #2: THE RIVER'S EDGE

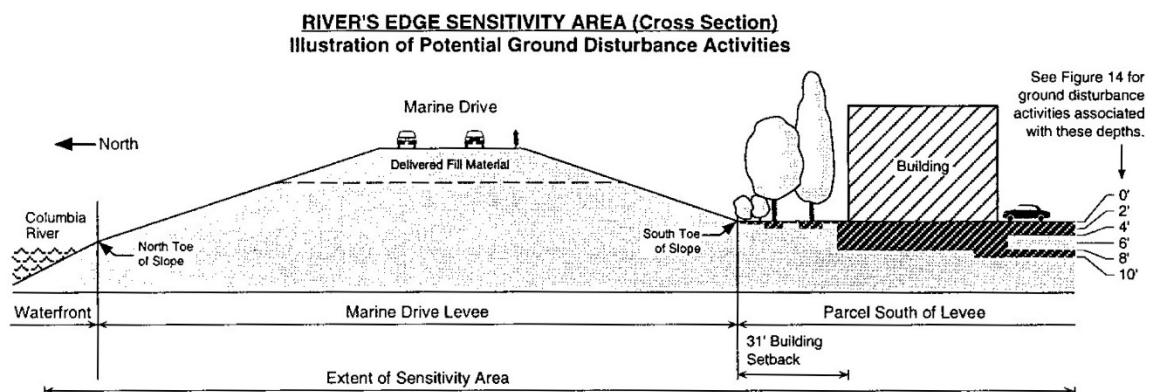
Economic, Social, Environmental and Energy Consequences

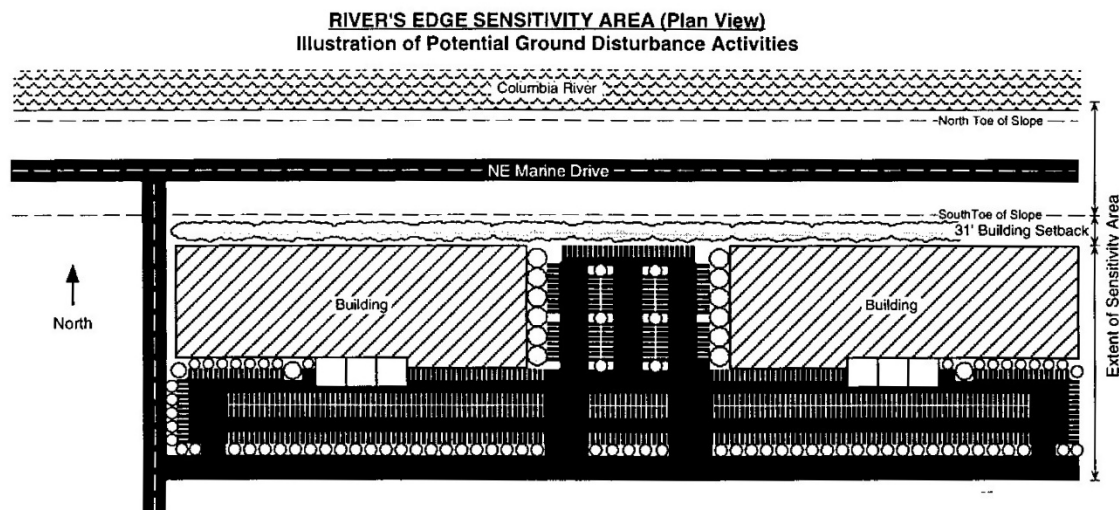
This section analyzes the consequences of protecting significant archaeological resources in Sensitivity Area 2 (River's Edge), and the consequences of allowing these resources to be degraded or destroyed. The analysis addresses four types of consequences: economic, social, environmental and energy. The general ESEE analyses found earlier in this chapter also applies to this sensitivity area, and are sharpened with this site analysis.

The River's Edge contains the following zoning categories: General Industrial (IG2), General Industrial with the Industrial Business Opportunity subdistrict (IG2 subdistrict), General Employment (EG2), Residential Farm and Forest (RF) and Open Space (OS).

For this analysis, the River's Edge is divided into three subareas (see Figure 19). First, the waterfront subarea extends from the ordinary high water mark to the north toe of levee slope. Second, the levee itself measures from the north toe of slope to the south toe of slope. The third subarea covers development sites that abut the south toe of slope. Figure 19 shows the three subareas with typical ground disturbance activities.

Figure 19: River's Edge Sensitivity Area: Cross Section and Plan View of Potential Ground Disturbance Activities





Significant archaeological resources, including a possible village site, are located in and near the Marine Drive levee within the River's Edge. Historic reconstruction of Columbia South Shore shows that the vicinity of present-day Marine Drive was highland suitable for sustained year-round villages, seasonal campsites and task-specific activity areas. Burial sites may also exist within the River's Edge, although no human remains have been reported to date in this area. The Lewis and Clark journals recorded two active village sites in the vicinity of the River's Edge. The eastern portion of the River's Edge also offered canoe access inland from the Columbia River through the Columbia Slough and connected lakes. Heritage and scientific values are supported throughout the River's Edge.

Confirmation testing is needed only in the southern subarea, where industrial uses are expected. The hand-held auger equipment would be difficult to penetrate the riprapped waterfront. The Marine Drive levee is layered with human-delivered fill material, and the potential for conflicting uses is relatively low. Confirmation testing in the River's Edge only applies to four development sites located between NE 158th and 185th Avenues. (See Figure 9).

ECONOMIC CONSEQUENCES

This analysis considers the economic consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 2. Each subarea is evaluated below.

In general, the Archaeological Plan reduces any negative impacts on conflicting uses by providing more certainty of requirements. First, the City initiated an

areawide archaeological investigation to assess the presence of cultural resources in the plan area. That investigation tested more than 425 acres and confirmed site boundaries of previously-recorded sites. It also put together a reconstructed landform model that identified candidate sites for confirmation testing.

Second, the archaeological plan also forges a dialog between the development community and appropriate tribes. In the interim before this plan is adopted, the Bureau of Planning has sent notices of relevant land use cases to tribal representatives and, in several cases, brought developers face-to-face with tribal representatives to get issues on the table at a preliminary phase of project development. The dialog between divergent stakeholders serves to break down suspicions and allow for timely decision-making in discovery situations. Discovery situations occur when possible archaeological materials are found while construction equipment is operating. Stop work orders that idle equipment and workers tend to add much more in project costs than do pre-development requirements envisioned for this plan.

Waterfront and Marine Drive Levee

The Columbia South Shore plan district includes approximately 5 miles of continuous waterfront properties along the south bank of the Columbia River. Most of the waterfront is either rip-rapped without structures (zoned OS) or built out as residential (zoned RF). Residential uses include single-dwelling development and a recently-completed houseboat moorage. The shoreline has been substantially modified with fill and riprap for the flood control levee, pilings for houses and docks, and a paved segment of the Columbia Slough recreational trail.

Indian use sites along the river shoreline will likely be deeply buried or lost by erosion. The Columbia River has risen 5 meters (16.5 feet) over the last 5,000 years. Approximately 10 miles of the Columbia River waterfront, including the River's Edge waterfront, have received reconnaissance (surface level) study to locate archaeological site evidence.

The Marine Drive levee is a regional flood control facility that extends through and beyond the plan area. A comparison between the 1917 topography map (prepared by the Multnomah County Drainage District No. 1) and current levee elevations confirms that substantial fill and riprap material has been added over the last 75 years. Below the human-delivered fill material are layers of alluvial fill material and base soil material. Since the alluvial fill material was deposited through the pre-contact period of Indian use, archaeological resource sites may be found in the base soil and alluvial fill layers of the levee. Projects that dig into the alluvial and base soil layers (such as dredge pipes and sewer outfall pipes) may encounter an archaeological resource site.

Most of the levee is either in the Marine Drive right-of-way or in private ownership with a drainage easement (with Multnomah County Drainage District No. 1). The zoning pattern splits at the centerline of Marine Drive, consistent with adjacent development sites. The northern levee slope is zoned either OS or RF. The southern levee slope is zoned either IG2 or EG2. Segments of the recreational trail along Marine Drive are built into either slope. The Columbia Slough Trail Master Plan calls for a paved trail segment to be built between the pump station at Marine Drive and NE 185th Avenue. The trail segment will likely be built on the south side of Marine Drive.

Full Protection of Significant Resources

Full resource protection means completing archaeological confirmation testing for development sites that abut the Marine Drive levee (south), no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. From the resource standpoint, full protection ensures that heritage and scientific values are not lost as the plan area develops. Such values are particularly high for village sites and any burial sites that may be encountered.

For the waterfront, full resource protection imposes limited economic consequences on the resource or conflicting uses. The waterfront has been substantially modified. The riprap layer has compacted and capped archaeological resource sites that remain. More shallow resource sites on the waterfront have likely eroded away over the years. Given that most unbuilt development sites are zoned for open space, the potential for additional ground disturbance activities on the waterfront is relatively small. Property values, public investments and employment, and tourism are not likely impacted to any great extent in the waterfront area.

For the levee, full protection has a remote possibility of imposing economic hardship, but is more likely to not affect development potential, property values, or public investments and employment. Full protection offers the greatest benefit to regional tourism, especially if new information becomes available about community lifeways or traditional American Indian cultural practices relating to village sites or burial sites.

The very remote negative impact would occur if full archaeological resource protection somehow precluded emergency flood control activities. That is, if a archaeological resource site were encountered at the same time that a flood event occurred, then special flood control measures would be necessary to isolate the archaeological site from damage from rising waters and from flood control measures. Life safety and property damage resulting from a major flood-related rupture of the levee might affect numerous properties within the Columbia South Shore. Archaeological protection measures that coordinate activities of the local drainage district and U. S. Army Corps of Engineers will likely prevent such worst-case events.

From the resource standpoint, full protection of an archaeological resource site along the waterfront or levee has incalculable economic value. Archaeological resource sites from the pre-contact period are irreplaceable. Their integrity is diminishing as historic use areas in the lower Columbia River basin are destroyed with development. The closest form of replacement value comes with detailed archaeological investigation and recording, and possible repatriation of

archaeological materials to the appropriate tribe. The potential economic loss of destroying a village site might translate into lower tourist revenues associated with a sharper image of the City's heritage and added social service needs to assist young American Indians who have a reduced sense of cultural identity.

No Protection of Significant Resources

Buried below man-delivered fill material, the levee contains base soil and alluvial soil layers from the pre-contact period. A possible village site has already been recorded in this subarea. If archaeological resource sites in the levee and waterfront are left unprotected, a village site may be lost forever. The economic impact of no protection is to lose important heritage and scientific values associated with archaeological resource sites. Aside from levee management to prevent flooding, the potential economic benefits (development potential, property values, and public investments and employment) of allowing conflicting uses on the levee are quite limited.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. From the resource standpoint, limited (partial) protection supports some scientific values (adding knowledge through testing) but may not fully support heritage values. Some resource sites may hold "place" value for associated tribes.

As described above, the waterfront subarea has been substantially modified and capped with riprap and the Columbia Slough recreational trail. The economic impacts of limited protection of the waterfront are small, given relatively low development potential of OS and RF zoning and the likelihood that archaeological sites that have not eroded away are capped by riprap. As with the full protection option, there are minor impacts on property values, and public investments and employment.

The most likely ground disturbance activities along the levee are maintenance of Marine Drive (particularly at the north/south street intersection), recreational trail construction and pilings for parking areas to the north. Limited resource protection of the levee, with a data recovery option, gives the developer more flexibility to design a project. However, the existence value of an archaeological site (village or other) is diminished if the site is removed from its setting.

Economic Recommendations for the Waterfront and Marine Drive Levee

Economic recommendations for the waterfront and Marine Drive levee include limited protection and full protection of each respective subarea. Full protection of the levee ensures protection of village sites, for which there is archaeological and ethnographic evidence in the River's Edge.

South of Marine Drive Levee

Development sites that abut the Marine Drive levee (south) also contain archaeological evidence and environmental features suitable for Indian use sites. During the pre-contact period, some development sites were grasslands located near the Columbia Slough. The Columbia Slough provided a direct water connection to the Columbia River. By way of modern analogy, the Columbia Slough likely functioned as an arterial (like NE Airport Way), which connected with the interstate river system (like I-84 and I-205 today). Resource harvesting areas were found in wetlands and lakes. American Indians may have portaged canoes between water features.

Today, most of the vacant development sites in this subarea have been farmed and are zoned for industrial uses (IG2). Between I-205 and NE 122nd Avenue (east), commercial uses are also allowed in sites zoned general employment 2, (EG2).

Full Protection of Significant Resources

For development sites south of the Marine Drive levee, full resource protection imposes opposing economic consequences on the resource or conflicting uses. For the archaeological resource, full protection offers positive tourist value. For conflicting uses, full protection has either neutral or negative impacts on development potential, property values, and public investment and employment.

Most unbuilt development sites in this subarea are zoned for industrial uses. The potential for additional ground disturbance activities is relatively high. As stated in the general economic discussion, the relevant measure of impact on development potential is to identify the overlap of archaeological sites and associated transition areas onto the buildable portion of development sites. Further, the proximity of the overlapping archaeological site to street access serves to approximate the relative impact on development potential. Most utility extensions onto individual development sites use the street right-of-way.

No Protection of Significant Resources

Similar to the levee subarea, the south of Marine Drive levee subarea has evidence of a possible village site. If archaeological resource sites in this subarea are not protected, a village site and other possible site types may be lost forever. The economic impact on an unprotected resource is to forego tourist revenues made possible by learning more about Indian use sites. Any information about village sites from the pre-contact period would enhance the ethnographic record for the 200th year commemoration of the Lewis and Clark exposition. According to Carl Abbott, the 100th year commemoration (a world's fair) spurred an economic boom in Portland. A 200th year commemoration would likely draw more visitor interest if the historical display of Portland covered the pre-contact period as well as the EuroAmerican experience. The exposition could celebrate the contributions of ethnic minorities, including American Indians, to the evolution of Portland. The tourism industry generates tax revenues and service sector jobs.

From the conflicting use perspective, full resource protection may reduce the flexibility of allowed uses to locate on a development site. A loss of site flexibility may result in reduced property values and employment growth. However, the Archaeological Plan has systematically narrowed the number of development sites potentially impacted by protection measures. As discussed above for the waterfront/levee subareas, the City paid for substantial archaeological testing and identified candidate testing sites from a reconstructed landform model. The potential impact area does not include building setback zones or areas zoned for environmental protection ("p" zone).

Limited (Partial) Protection of Significant Resources

Limited (partial) protection on development sites south of the Marine Drive levee would ensure that gaps in confirmation testing are filled, but that some ground disturbance is allowed on or near confirmed archaeological sites. From the resource standpoint, limited (partial) protection means a loss of some heritage values. For purposes of this Goal 5 analysis, the City recognizes burial sites and village sites as having the strongest scientific and heritage values because those sites typically involve more people for relatively long periods of use. Seasonal campsites and activity areas also support heritage and scientific values, but not to the extent of burial sites and village sites. In economic terms, protection of certain site types may spark the interest of tourists in extending their stay locally.

From the conflicting use standpoint, limited (partial) protection imposes a relatively minor cost of confirmation testing and allows for some site disturbance through a data recovery plan. To date, only one confirmed site extends into the buildable portion of a development site in this subarea. The archaeological site is

located opposite the planned street access point identified in the Airport Way Secondary Infrastructure Plan.

Economic Recommendations for South of Marine Drive Levee

For the south of Marine Drive levee subarea, staff proposes full protection of burial and village sites, and limited protection of seasonal campsites or activity areas.

SOCIAL CONSEQUENCES

This analysis considers the social consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 2 (the River's Edge). The social analysis breaks out archaeological site types, not geographic subareas (as done with the economic analysis).

The general social analysis identified the Columbia South Shore, including the Columbia Slough and nearby natural resources, as remnants of a vast and complex series of waterways and wildlife habitat areas of the Columbia River floodplain. Scientific values are particularly high for the River's Edge because archaeological evidence exists for a village site, and other sites may also be encountered. Resource site protection may add to knowledge and provide opportunities to interpret and educate the general public on Indian use. The River's Edge also holds significance to associated tribes, whose ancestors subsisted on the natural resources of this area, lived along the Columbia River and may have buried their dead within the area. For associated tribes, the land provides physical and spiritual sustenance as well as a connection to the past. Without a connection to the past, American Indian descendants would lose a vital part of their social fabric and, therefore, their identity as a distinct and viable culture.

Archaeological resource protection also supports other social values, such as recreational and educational opportunities, visual variety and impact, urban design and image of the City, and screening and buffering of incompatible uses. The River's Edge contains an elevated scenic corridor (NE Marine Drive) and segments of the Columbia Slough Trail.

Full Protection of Significant Resources

As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. This action protects significant cultural resources and

associated heritage and scientific values identified in the site inventory. The social consequences are positive.

No Protection of Significant Resources

No protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. No protection results in the loss of significant archaeological resources and associated heritage and scientific values identified in the site inventory. The social consequences are negative.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. Limited (partial) protection can have negative, neutral or positive consequences, depending on the site type and manner in which the archaeological and Tribal communities are involved in project design. This analysis discusses scientific and heritage values below.

Scientific values may be retained if, prior to construction, the development site receives confirmation testing and an avoidance protocol is followed. For purposes of this plan, an avoidance protocol gives the following priorities: 1) preserve the archaeological site in place (particularly burial sites and village sites); 2) place the deepest or otherwise most conflicting ground disturbance activities away from archaeological sites on a given development site (e.g., design around the site); and 3) if avoidance is not possible, carefully evaluate, record and cap over or recover the archaeological materials in consultation with associated tribes. If a detailed evaluation is not possible with the development proposal, the archaeological site should be avoided and steps taken to provide future access to the archaeological site.

Limited (partial) protection may lessen heritage values, unless the developer consults with appropriate tribes on a data recovery plan and the Tribes find that removal of the archaeological site can be accomplished in a respectful manner.

In summary, the social effects of limited (partial) protection on significant archaeological resources vary with the site type and observance of the avoidance protocol. Limited (partial) protection of burial sites and village sites is negative. For seasonal campsites and activity areas, the social effects of this action are negative unless testing and consultation steps are followed.

Social Recommendations for the River's Edge Area

Full protection of burial sites and village sites. Provide limited protection of seasonal campsites and activity areas where full protection would preclude a reasonable building footprint and access into the development site.

ENVIRONMENTAL CONSEQUENCES

This analysis considers the environmental consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 2 (River's Edge). As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. Finally, no protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas.

Full Protection of Significant Resources

This action protects significant environmental resources and associated resource values identified in the inventory by adding to protected natural areas in the sensitivity area. The environmental consequences are positive.

No Protection of Significant Resources

No protection results in an opportunity cost of not extending resource protection boundaries adjacent to areas already zoned for environmental protection ("p") or environmental conservation ("c"). The environmental consequences are negative.

Limited (Partial) Protection of Significant Resources

Limited (partial) protection has neutral environmental consequences.

Environmental Recommendations for the River's Edge Area

Fully protect significant archaeological resources, particularly those resource sites that overlap with and hold natural resource values.

ENERGY CONSEQUENCES

This analysis considers the energy consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 2 (River's Edge). The discussion involves the following topics: heating and cooling of structures, transportation and infrastructure. This analysis builds on the general energy analysis of these topics presented earlier.

Two kinds of conflicting uses can be expected in the River's Edge. Most development potential in this sensitivity area is expected south of the Marine Drive levee, where development sites are zoned for industrial uses (IG2). To a lesser extent, residential or houseboat moorage development may occur along the Columbia River waterfront (with RF zoning).

One design solution to reduce fuel consumption for heating and cooling of structures is to cluster buildings. Some industrial uses are better able to cluster buildings than are others, due to functional needs. For example, due to east winds that blow through the plan area, project engineers try to orient dock doors away from an eastern exposure.

Most development sites are expected to deliver goods by truck, using NE Airport Way and the interstate freeway connections. The River's Edge sensitivity area is located away from the Airport Way spine. The construction of secondary roads and related utility extensions needed to serve the affected development sites will consume more energy than will the construction of development sites with existing street frontage. Most unbuilt development sites along Airport Way are located outside of an archaeological sensitivity area identified in this plan.

Full Protection of Significant Resources

As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. Energy consequences are generally positive, though potentially negative if certain uses are forced to locate outside the Urban Growth Boundary (UGB).

No Protection of Significant Resources

No protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. No protection may lead to lost opportunities to save energy through the retention of vegetation and clustering of buildings. The energy effects of this loss are negative.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. This action has generally positive energy consequences because alternative development forms and landscape treatments are available for a particular use to locate on a given site, if it is necessary to locate the development on or near a archaeological resource site.

Energy Recommendations for the River's Edge

Fully protect significant resources, except where allowed uses are pushed outside established urban areas or street access becomes unfeasible to a platted development site. Energy consequences are generally positive, though potentially negative if certain uses are forced outside the Urban Growth Boundary.

Figure 20: Conflict Resolution Summary Table for the River's Edge Sensitivity Area

Recommended Level of Protection Based on ESEE Factors

Goal 5 Sensitivity Area	Location	Economic	Social	Environ- -mental	Energy	Decision
Area 2: River's Edge	Columbia River frontage (north of Marine Drive)	Partial	Full/ burial, villages and traditional, sacred or cultural use sites Partial/ seasonal sites	Full	Full	Full/ burial Partial/ all other cultural resources*
	Marine Drive levee	Full	Full/ burial, villages and traditional, sacred or cultural use sites Partial/ seasonal sites	Full	Full	Full/ burial Partial/ all other cultural resources*
	Areas south of levee toe of slope	Full or partial	Full/ burial, villages and traditional, sacred or cultural use sites Partial/ seasonal sites	Full	Full	Full/ burial Partial/ all other cultural resources*

* Partial Protection involves consultation with appropriate tribes.

SENSITIVITY AREA #3: THE COLUMBIA SLOUGH

Economic, Social, Environmental and Energy Consequences

This section analyzes the consequences of protecting significant archaeological resources in Sensitivity Area 3 (Columbia Slough), and the consequences of allowing these resources to be degraded or destroyed. The analysis addresses four types of consequences: economic, social, environmental and energy. The general ESEE analyses found earlier in this chapter also apply to this sensitivity area, and are sharpened with this site analysis.

This site, exclusive of developed sites, contains the following zoning categories: General Industrial (IG2), General Industrial with the Industrial Business Opportunity subdistrict (IG2 subdistrict), and General Employment (EG2). All development sites in Sensitivity Area 3 have either environmental protection ("p") zoning or environmental conservation ("c") zoning along the Columbia Slough frontage. The width of environmental zoning in the plan area is typically 50 feet from the top of bank.

As discussed in the inventory chapter, the Columbia Slough provided direct canoe access between the Columbia River, village sites and seasonal campsites and activity areas. The Columbia Slough served the modern equivalent of an arterial (like NE Airport Way), feeding into the interstate system (Columbia River).

The Columbia Slough also provided substantial subsistence food sources for Indians. Resource harvesting areas were found in wetlands and lakes. Indians may have portaged canoes between water features. In short, heritage and scientific values are supported throughout the Columbia Slough.

Portions of the Columbia Slough have been altered in recent years. The confirmation testing identified in Figure 9 makes use of a reconstructed landform map to sort out those alterations. To date, seasonal campsites and task-specific activity areas are the only site types found within Sensitivity Area 3. Burial sites may also exist, but no human remains have been reported within this sensitivity area.

ECONOMIC CONSEQUENCES

This analysis considers the economic consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 3. Most of this area is already protected with environmental zoning, particularly the more restrictive "p" zone.

Most properties along the Columbia Slough, within Columbia South Shore, have been developed or adequately tested to assess the presence of archaeological sites. There are three areas along the Columbia Slough that need more confirmation testing to fill in gaps (see Figure 9). First, three development sites near the Four Corners lack auger probes. Of these, one development site is owned by a radio station that declined to participate in the City's inventory. Another development site is owned by the City of Portland, with no intention to develop it. Second, a second radio station (located east of NE 158th, along the southern slough arm) declined to participate. The third gap is an interior portion of the Portland International Center development site (located between NE 82nd and Interstate 205).

Most unbuilt parcels in this subarea are zoned for industrial uses. The potential for additional ground disturbance activities is relatively high. As stated in the general economic discussion, the relevant measure of impact on development potential is to identify the overlap of archaeological sites and associated transition areas onto the buildable portion of development sites. Further, the proximity of the overlapping archaeological site to street access serves to approximate the relative impact on development potential. Most utility extensions onto individual development sites use the street right-of-way.

In general, the Archaeological Plan reduces any negative impacts on conflicting uses by providing more certainty of requirements. First, the City initiated an areawide archaeological investigation to assess the presence of archaeological resources in the plan area. That investigation tested more than 425 acres and confirmed site boundaries of previously-recorded sites. It also put together a reconstructed landform model that identified candidate sites for confirmation testing.

Second, the archaeological plan also forges a dialog between the development community and appropriate tribes. In the interim before this plan is adopted, the Bureau of Planning has sent notices of relevant land use cases to tribal representatives and, in several cases, brought developers face-to-face with tribal representatives to get issues on the table at a preliminary phase of project development. The dialog between divergent stakeholders serves to break down suspicions and allow for timely decision-making in discovery situations. Discovery situations occur when possible archaeological materials are found while construction equipment is operating. Stop work orders that idle equipment and workers tend to add much more in project costs than do pre-development requirements envisioned for this plan.

Full Protection of Significant Resources

Full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. From the resource standpoint, full protection ensures that heritage and scientific values are not lost as the plan area develops. Such values are particularly high for village sites and any burial sites that may be encountered. Full protection of an archaeological resource site within the Columbia Slough sensitivity area also has incalculable economic value. Archaeological resource sites from the pre-contact period are irreplaceable. Their integrity is diminishing as historic use areas in the lower Columbia River basin are destroyed with development. The closest form of replacement value comes with detailed archaeological investigation and recording, and possible repatriation of archaeological materials to the appropriate tribe.

Given that most unbuilt development sites in Sensitivity Area 3 have "p" zone protection, the potential for additional ground disturbance activities is mostly an issue for any archaeological sites that extend into areas adjacent to, and outside the "p" zone. The Archaeological Plan has systematically narrowed the number of development sites potentially impacted by protection measures. As discussed above for the waterfront/levee subareas, the City paid for substantial archaeological testing and identified candidate testing sites from a reconstructed landform model. Property values, public investments and employment, and tourism are not likely impacted to any great extent.

Full protection offers the greatest benefit to regional tourism, especially if new information becomes available about community lifeways or traditional cultural practices relating to historic use of the Columbia Slough. The Columbia Slough Trail, located along the Columbia Slough, provides recreational access along a significant natural area.

From the resource standpoint, full protection of an archaeological resource site along the Columbia Slough has incalculable economic value. Archaeological resource sites from the pre-contact period are irreplaceable. Their integrity is diminishing as historic use areas in the lower Columbia River basin are destroyed with development. The closest form of replacement value comes with detailed archaeological investigation and recording, and possible repatriation of archaeological materials to the appropriate tribe. The potential economic loss of destroying sites along the slough might translate into lower tourist revenues associated with a sharper image of the City's heritage and added social service needs to assist young American Indians with reduced sense of identity.

No Protection of Significant Resources

No protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. The economic effect of no protection is to lose important heritage and scientific values associated with archaeological resource sites. By foregoing these resource values, economic opportunities to recruit industries attracted by a quality of life and sense of place may be lost. Tourism revenues may also be foregone with this option. The potential economic benefits (development potential, property values, and public investments and employment) of allowing conflicting uses on the levee are quite limited.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. From the resource standpoint, limited (partial) protection supports some scientific values (adding knowledge through testing) but may not fully support heritage values. Some resource sites may hold "place" value for the associated Tribes.

For purposes of this Goal 5 analysis, the City recognizes burial sites and village sites as having the strongest scientific and heritage values because those sites typically involve more people for relatively long periods of use. Seasonal campsites and activity areas also support heritage and scientific values, but not to the extent of burial sites and village sites. In economic terms, protection of certain site types may spark the interest of tourists in extending their stay locally. Based on consultation with tribes, an additional archaeological resource classification, traditional, sacred or cultural use sites, was created. The city continues to consult with tribes for information on this resource classification. No archaeological resources in the plan area have been classified as traditional or sacred use sites, although the possibility exists that this type of resource could be discovered during future confirmation testing.

From the conflicting use standpoint, limited (partial) protection imposes a relatively minor cost of confirmation testing and allows for some site disturbance through a data recovery plan. To date, only one confirmed site extends into the buildable portion of a development site in this subarea. The archaeological site is located in the path of a planned street access point identified in the Airport Way Secondary Infrastructure Plan. However, an alternative access route is available.

Economic Recommendations for the Columbia Slough

Fully protect any archaeological sites located in the "p" or "c" zones, or in a building setback area. Avoid landlocking a development site by preventing street access. It is not likely that street access would be prevented on the development sites that have a confirmed archaeological site or need confirmation testing.

SOCIAL CONSEQUENCES

This analysis considers the social consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 3 (the Columbia Slough). The analysis considers archaeological site types.

The general social analysis identified the Columbia South Shore, including the Columbia Slough and nearby natural resources, as remnants of a vast and complex series of waterways and wildlife habitat areas of the Columbia River floodplain. Scientific values are particularly high for the Columbia Slough because the slough provided an arterial travel mode and offered abundant natural resources for subsistence living. Through confirmation testing, other sites may be identified. Resource site protection may add to knowledge and provide opportunities to interpret and educate the general public on Indian use. The Columbia Slough holds significance to associated Tribes, whose ancestors subsisted on the natural resources of this area, lived along the Columbia River and may have buried their dead within the area. For those Tribes, the land provides physical and spiritual sustenance as well as a connection to the past. Without a connection to the past, American Indian descendants would lose a vital part of their social fabric and, therefore, their identity as a distinct and viable culture.

Archaeological resource protection also supports other social values, such as recreational and educational opportunities, visual variety and impact, urban design and image of the City, and screening and buffering of incompatible uses. Sensitivity Area 3 contains a major segment of the Columbia Slough Trail.

Full Protection of Significant Resources

As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. This action protects significant archaeological resources and associated heritage and scientific values identified in the site inventory. The social consequences for the resource are positive. Likewise, conflicting uses benefit in terms of quality of life and sense of place.

No Protection of Significant Resources

No protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. No protection results in the loss of significant archaeological resources and associated heritage and scientific values identified in the site inventory. The social consequences are negative for the resource and conflicting uses.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. Limited (partial) protection can have negative, neutral or positive consequences, depending on the site type and manner in which the archaeological and Tribal communities are involved in project design. This analysis discusses scientific and heritage values below.

Scientific values may be retained if, prior to construction, the development site receives confirmation testing and an avoidance protocol is followed. For purposes of this plan, an avoidance protocol gives the following priorities: 1) preserve the archaeological site in place (particularly burial sites and village sites); 2) place the deepest or otherwise most conflicting ground disturbance activities away from archaeological sites on a given development site (e.g., design around the site); and 3) if avoidance is not possible, carefully evaluate, record and cap over or recover the archaeological materials in consultation with appropriate Tribes. If a detailed evaluation is not possible with the development proposal, the archaeological site should be avoided and steps taken to provide future access to the archaeological site.

Limited (partial) protection may lessen heritage values, unless the developer consults with associated Tribes on a data recovery plan and the Tribes find that removal of the archaeological site can be accomplished in a respectful manner.

In summary, the social effects of limited (partial) protection on significant archaeological resources vary with the site type and observance of the avoidance protocol. Limited (partial) protection of burial sites and village sites is negative. For seasonal campsites and activity areas, the social effects of this action are negative unless testing and consultation steps are followed.

Social Recommendations for the Columbia Slough

Fully protect burial sites and village sites. Provide limited protection of seasonal campsites and activity areas where full protection would preclude a reasonable building footprint and access into the development site.

ENVIRONMENTAL CONSEQUENCES

This analysis considers the environmental consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 3 (Columbia Slough). As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. Finally, no protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas.

Full Protection of Significant Resources

This action protects significant environmental resources and associated resource values identified in the inventory by adding to protected natural areas in the sensitivity area. The environmental consequences are positive to the resource and to conflicting uses.

No Protection of Significant Resources

No protection results in an opportunity cost of not extending resource protection boundaries adjacent to areas already zoned for environmental protection ("p") or environmental conservation ("c"). The environmental consequences are negative to the resource and to conflicting uses.

Limited (Partial) Protection of Significant Resources

Limited (partial) protection has negative environmental consequences to the resource and conflicting uses.

Environmental Recommendations for the Columbia Slough

Fully protect significant archaeological resources, particularly those resource sites that overlap with and hold natural resource values.

ENERGY CONSEQUENCES

This analysis considers the energy consequences of prohibiting, limiting or allowing conflicting uses within Sensitivity Area 3 (Columbia Slough). The discussion involves the following topics: heating and cooling of structures, transportation and infrastructure. This analysis builds on a general energy analysis of these topics.

Two kinds of conflicting uses can be expected in the Sensitivity Area 3. Most development potential in this sensitivity area is for industrial uses (IG2). In the Portland International Center (PIC) area, some EG2 zoning also exists, which allows industrial or commercial uses.

One design solution to reduce fuel consumption for heating and cooling of structures is to cluster buildings. Some industrial uses are better able to cluster buildings than are others, due to functional needs. Due to east winds that blow through the plan area, project engineers try to orient dock doors away from an eastern exposure.

Most development sites are expected to deliver goods by truck, using NE Airport Way and the interstate freeway connections. The Columbia Slough sensitivity area is located away from the Airport Way spine. The construction of secondary roads and related utility extensions needed to serve the affected development sites will consume more energy than will the construction of development sites with existing street frontage. Most unbuilt development sites along Airport Way are located outside of an archaeological sensitivity area identified in this plan.

Full Protection of Significant Resources

As stated earlier, full resource protection means completing archaeological confirmation testing for the development sites identified above, no ground disturbance of confirmed archaeological sites, and some level of protection for adjacent transition areas. Energy consequences are generally positive for the resource and conflicting use, though potentially negative if certain uses are forced to locate outside the Urban Growth Boundary (UGB).

No Protection of Significant Resources

No protection means no further archaeological confirmation testing for development sites, no special restrictions on ground disturbance activities, and no special restrictions on adjacent transition areas. No protection may lead to lost opportunities to save energy through the retention of vegetation and clustering of buildings. The energy effects of this loss is negative for the resource and for conflicting uses.

Limited (Partial) Protection of Significant Resources

Limited (or partial) protection means completing archaeological confirmation testing on development sites, allowing partial ground disturbance of confirmed archaeological sites and/or recovery of associated archaeological materials, and some level of protection for adjacent transition areas. This action has generally positive energy consequences because alternative development forms and landscape treatments are available for a particular use to locate on a given site, if it is necessary to locate the development on or near an archaeological resource site.

Energy Recommendations for the Columbia Slough

Fully protect significant resources, except where allowed uses are pushed outside established urban areas or street access becomes unfeasible to a platted parcel. Energy consequences are generally positive, though potentially negative if certain uses are forced outside the Urban Growth Boundary.

Figure 21: Conflict Resolution Summary Table for the Columbia Slough Sensitivity Area

Recommended Level of Protection

Based on ESEE Factors

Goal 5 Sensitivity Area	Location	Economic	Social	Environ- mental	Energy	Decision
Area 3: Columbia Slough	Areas with environ- mental protection ("p") zone	Full	Full	Full	Full	Full ¹
	Areas with environ- mental conservation ("c") zone	Full	Full/ burial, villages, and traditional, sacred or cultural use sites Partial/ seasonal sites	Full	Full	Full/ burial Partial/ all other archaeo- logical resource sites ²
	Areas adjacent to "p" or "c" zone	Full or partial	Full/ burial, villages, and traditional, sacred or cultural use sites Partial/ seasonal sites	Full	Full	Full/ burial Partial/ all other archaeo- logical resource sites ²

¹ Areas with environmental protection, "p" zone" already receive full protection.

² Partial protection involves consultation with appropriate tribe.

CONFLICT RESOLUTION AND RECOMMENDATIONS

This chapter discussed the significant archaeological resources and associated resource values within the Columbia South Shore plan district. There are important archaeological resource values area-wide (common to all archaeological resource sites or multiple sites) as well as site specific (limited to individual resource sites).

Protection of area-wide values would require more than one site to be protected. Examples of area-wide values are heritage values, scientific values, recreational opportunities, flood storage and wildlife corridors. Site-specific values are local in nature. Examples of site-specific values include environmental setting, heritage and scientific values associated with individual sites and natural resource functions.

Protection of an archaeological resource value can apply to a single site or a group of sites, depending on the type of value and balancing of conflicts between a resource site and conflicting uses through the analysis of economic, social, environmental and energy consequences as summarized in the previous sections. The preceding analyses provide the rationale for decisions made regarding archaeological resource protection for inventoried sites and sensitivity areas in the Columbia South Shore. Any of the following three decisions can be made for archaeological resource sites identified within each sensitivity area:

- 1. Protect the resource fully.** This action occurs in areas where the resource, relative to conflicting uses, is sufficiently important that the resource should be protected. Conflicting uses are allowed elsewhere on the development site.
- 2. Limit the conflicting uses in a manner which protects the resource.** This action occurs in areas where both the resource and conflicting uses are important relative to each other, and restrictions are placed on conflicting uses which would protect identified resource values while at the same time allowing some or all conflicting uses on the development site.
- 3. Allow the conflicting use fully.** This action occurs in areas where conflicting uses, notwithstanding the impact on the resource, are sufficiently important to warrant being allowed fully and without archaeological resource-related restrictions.

Figure 22 lists the sensitivity area sites, their location and a summary of the conclusions and decision on each archaeological sensitivity area regarding archaeological resource protection. The recommendations for each of the four ESEE factors considered are listed. "Full" designates full protection, "limited"

designates limited protection and "none" indicates no protection. The final column lists the recommended decision on the level of archaeological resource protection for each sensitivity area. Figure 22 serves as the basis for protection measures in Chapter 10.

Figure 22: Conflict Resolution Summary Table for Archaeological Resources in the Columbia South Shore

September 2004

Recommended Level of Protection Based on ESEE Factors						
Sensitivity Area	Location	Economic	Social	Environmental	Energy	Decision
1: Historic Lakes	Sites 35 MU 58 and 35 MU 97 (All within "p" zone)	Full	Full	Full	Full	Full ¹
	Site 35 MU 79 (All within "c" zone)	Partial	Full	Full	Full	Partial
	Site 35 MU 84	Partial	Full	Full	Full	Partial
	Site 35 MU 82	Partial	Full	Full	Full	Partial
	Columbia River frontage (north of Marine Drive)	Partial	Full/burial, villages, and traditional, sacred or cultural use sites	Full	Full	Full/burial Partial/all other cultural resources
2: River's Edge	Marine Drive levee	Full	Full/burial, villages, and traditional, sacred or cultural use sites	Full	Full	Full/burial Partial/all other cultural resources ²
	Areas south of levee toe of slope	Full or partial	Full/burial, villages, and traditional, sacred or cultural use sites	Full	Full	Full/burial Partial/all other cultural resources ²
	Areas within environmental protection ("p") zone	Full	Full	Full	Full	Full ¹
3: Columbia Slough	Areas within environmental conservation ("c") zone	Full	Full/burial, villages, and traditional, sacred or cultural use sites	Full	Full	Full/burial Partial/all other cultural resources ²
	Areas adjacent to "p" or "c" zone	Full or partial	Full/burial, villages, and traditional, sacred or cultural use sites	Full	Full	Full/burial Partial/all other cultural resources ²

¹ Areas with environmental protection ("p") zone already receive full protection.

² Partial protection involves consultation with appropriate tribes.

CHAPTER 10: PROTECTION PLAN MEASURES

INTRODUCTION

This chapter develops a program to implement the decisions made in Chapter 9 to protect archaeological resources in the Columbia South Shore plan district (see Figure 22). This chapter begins with a general summary of the Goal 5 process and constraints to protecting archaeological resources through Goal 5. Next, the chapter summarizes conclusions reached as part of the ESEE analysis in Chapter 9. Third, the chapter discusses options considered during program development, including a general summary of implementation measures. Finally, Plan policies and objectives which form a foundation for these measures are presented, followed by adopted measures and zoning code language.

GENERAL SUMMARY OF GOAL 5 PROCESS

The Columbia South Shore plan district contains three identified archaeological sensitivity areas. Development pressure is high in the district and threatens to degrade identified archaeological resource sites and their associated heritage and scientific values. Measures are needed to limit and in certain areas prohibit conflicting uses so that development can be allowed to continue without degradation or loss of identified archaeological resources.

Statewide Planning Goal 5 requires that jurisdictions protect archaeological resources found to be significant. The administrative rule for Goal 5 requires that the jurisdiction conduct an inventory to determine the location, quality and quantity of such resources. Chapter 8 of this report provides the results of the inventory conducted in the Columbia South Shore plan district.

Next, local governments are required to analyze economic, social, environmental and energy consequences of resource protection. Chapter 9 provides a detailed analysis of the economic, social, environmental and energy consequences of permitting, limiting or prohibiting conflicting uses. Impacts on both the resource by conflicting uses, and conflicting uses by the resource, are considered and resolved. The chapter concludes with a discussion of recommendations for each of the four ESEE factors considered, including the level of resource protection needed for each archaeological sensitivity area.

The program recommendations addressed in this chapter are intended to meet Goal 5 requirements. This chapter contains the policies, objectives and regulations necessary to implement the required protection of significant Goal 5 resources

within the Columbia South Shore plan district. This protection plan is based on resolution of the conflicts between uses as identified in the detailed ESEE analysis.

The *Archaeological Resource Protection Plan for the Columbia South Shore* (ARPP) complements the state archaeological program and provides more certainty than occurs with the state archaeological process. The state archaeological process is permit oriented whereas the ARPP is outcome oriented. The ARPP provides a decision making framework for levels of archaeological resource protection and balances the impacts of protecting an archaeological resource site with the impacts of allowing a conflicting use.

Owners and developers are encouraged to consult early with state and federal agencies, and with affected tribes. Some state and federal requirements exceed the city's archaeological plan. Due to constraints imposed by the current Goal 5 administrative rule, this plan does not address discovery situations. A discovery situation occurs when archaeological materials are encountered during project construction. For example, a backhoe operator might unearth bones or a band of charcoal with stone flakes. Currently, the state archaeological permit program provides guidance for discovery situations.

The Oregon archaeological permit program has undergone changes through the last few years such that private lands are now subject to the permit process. The state legislature further modified the the state program to apply the permit process upon disturbance of an archaeological site, whether intentional or not.

Given the context of the changing regulatory permit process, the *Archaeological Resources Protection Plan* adds value by:

- 1) bringing together disparate stakeholders to increase understanding and forging work relationships;
- 2) adding to the knowledge base of archaeological resources and past Indian use; and
- 3) providing more certainty of archaeological resource locations and their management because the City is a source of site records and this plan sets out clear and objective standards.

Figure 23: Summary of Conclusions Made During ESEE Analysis

- 1) Two of the three sensitivity areas have not been adequately tested to complete the baseline sampling of archaeological testing in the Columbia South Shore. Figure 9 (page 86) shows the development sites in the River's Edge and the Columbia Slough sensitivity areas that need further testing. Figure 10 (page 99) shows the boundaries of each sensitivity area.
- 2) For purposes of this plan, archaeological resources fit into one of four categories: burials; villages; traditional, sacred or cultural use sites; and seasonal campsites/activity areas. The ESEE analysis makes use of these site types.
- 3) Identified archaeological resources that fall entirely within the environmental protection ("p") zone should be fully protected, regardless of site type. The development potential in the "p" zone is quite limited.
- 4) Identified archaeological resources that do not fall within the environmental protection ("p") zone receive full or partial protection, depending on the site type. Burials receive full protection. All other archaeological resources receive partial protection.
- 5) "Full protection" means (a) completing archaeological "confirmation testing" for that development site, (b) no ground disturbance of identified archaeological resources, and (c) some level of protection for adjacent transition areas.
- 6) "Partial protection" means (a) completing archaeological "confirmation testing" for that development site, (b) partial ground disturbance of identified archaeological resources and/or recovery of associated archaeological materials, and (c) some level of protection for adjacent transition areas.
- 7) "No protection" means (a) no further archaeological testing for that development site through State Goal 5, (b) no special restrictions on ground disturbance activities, and (c) no special restrictions on adjacent transition areas.
- 8) Confirmation testing, including the City's areawide investigation and individual project testing, will never eliminate the risk of disturbing a archaeological resource during project construction. Due to the limits of current State Goal 5, this plan does not attempt to provide discovery provisions. To date, the Department of Land Conservation and Development (DLCD) has not promulgated new administrative rules for archaeological resources.

PROGRAM OPTIONS

The Bureau of Planning reviewed with the Cultural Resources Advisory Committee a number of potential measures to implement the *Archaeological Resources Protection Plan for the Columbia South Shore*. Those measures included acquiring some or all property rights, creating a financial incentive, using existing zoning tools and creating new zoning tools to be used for purposes of archaeological resource protection. Each of the potential measures is described below.

ACQUIRE SOME OR ALL PROPERTY RIGHTS

There are two forms of acquisition: full or partial acquisition of property rights. Full, or fee simple, acquisition may occur when a nonprofit organization or public agency buys some or all of an archaeological resource. One private, nonprofit agency that has acquired archaeological resources throughout the country, including Oregon, is the Archaeological Conservancy the possible acquisition of an archaeological resource in the plan area. The Archaeological Conservancy buys significant archaeological resources for long-term stewardship.

The Archaeological Conservancy acquires archaeological resources by gift, purchase or a bargain sale to charity, where the seller receives substantial tax benefits. A revolving Preservation Fund is often used to finance emergency acquisitions, then repaid as local funds are raised. Because the Conservancy is private, it is able to act quickly and independently to meet the situation. Funds for the Archaeological Conservancy come from membership dues, individual contributions, corporations and foundations. Income from a permanent Endowment Fund supplements regular fundraising. Money to purchase specific properties is raised locally on a project by project basis. Lines of credit are sometimes utilized in emergency situations.

When an archaeological resource is acquired, the Conservancy formally dedicates it as a permanent archaeological preserve. A committee of experts and local interested individuals, including the associated tribal representative, then prepare a 100-year management plan for the preserve.

A second possible source of full acquisition is the Portland Bureau of Environmental Services (BES). The BES is buying properties in the Columbia South Shore to be used to filter and store stormwater runoff that flows to the Columbia Slough. The BES has targeted several candidate sites for acquisition which are located in the sensitivity areas identified in Chapter 8 of this plan. If BES buys property that contains archaeological resources, the range of conflicting uses to those archaeological resources will be reduced substantially.

The second form of site acquisition, partial acquisition, involves the purchase of some property rights that apply to a given development site. Partial acquisition of rights that “run with the land” may be accomplished through conservation easements or deed restrictions. Conservation easements are restrictions that an owner records with a deed. Prospective owners are alerted to the easement during a title search.

CREATE A FINANCIAL INCENTIVE

One method for creating a financial incentive aimed at protecting archaeological resources is an adjusted property tax assessment. The commercial appraisers of Multnomah County already discount the value of land zoned for environmental protection (“p” zone). This adjustment could be used for lands containing identified archaeological resources. This method is limited to the extent that it works best when used in conjunction with another protection measure, such as zoning or a conservation easement.

USE EXISTING ZONING TOOLS

Existing zoning tools that can be applied toward archaeological resource protection include the environmental (“p” or “c”) zones as mapped and the streetscape standards which set building setback areas along Marine Drive.

The environmental zones serve to protect significant natural resources and associated functional values that have been identified by the City as providing benefits to the public. The environmental “p” zone provides the highest level of protection to the most important resources and functional values. Development will be approved in the “p” zone only in rare and unusual circumstances. As such, the City could amend the “p” zone provisions in the Columbia South Shore plan district to recognize archaeological resources and related resource values as identified in Chapter 8 of this report. If this is the only protective measure, some expansion of the “p” zone will also be necessary to protect archaeological resources that currently lack resource protection.

Use of the “p” zone could be highly effective in terms of protecting archaeological resources because the “p” zone allows few conflicting uses. Confidentiality could be maintained for archaeological resources that currently are located within a “p” zone. In those cases where the “p” zone would need to be expanded to incorporate an archaeological resource, site confidentiality might be lost. An alternative to this issue is to apply the “p” zone in a generalized manner. One consequence of this might be that development potential is overly limited without an equivalent resource benefit.

The environmental “c” zone, on the other hand, is used to conserve important resources and associated functional values in areas where the resources and

functional values can be protected while allowing environmentally sensitive urban development. The "c" zone allows development to occur with mitigation, and is not suited to an archaeological resource that should be fully protected. As such, the "c" zone is suited to a limited level of protection. This option is only effective for archaeological resources that warrant limited protection and does not require extending the "c" zone on zoning maps.

Required building setbacks and on-site landscaping offer a second existing zoning tool that may assist in protecting archaeological resources. With an adjustment review (or by amending the Marine Drive Streetscape standards), a building setback might be modified to design development around an archaeological resource.

CREATE NEW ZONING TOOLS

Examples of new zoning tools that could be used to protect archaeological resources include transfer of development rights (TDR's), creating an archaeological resource overlay zone tailored to this plan, and hiring of a contract archaeologist who would review development projects.

TDR's involves the transfer of development rights between a sending parcel and a receiving parcel. At present, the City's experience with TDR's is limited to the Skyline Plan District, which allows residential development rights on p-zoned parcels to transfer to other parcels without an environmental zone. In the Columbia South Shore plan district, parcels zoned or designated for general employment (EG2) are the most likely parcels to benefit from TDR's. Commercial uses are more likely to build multi-story buildings to take advantage of extra floor space provided to a receiving parcel.

The creation of an archaeological resource overlay zone would involve amendments to the City's zoning code language and maps. The overlay zone would delineate the archaeological resources identified in Chapter 8 and through confirmation testing. The new overlay zone could be tailored to the relative significance of each archaeological resource. This method adds complexity to the current zoning code and it would reveal individual site locations.

The third option in this category could involve hiring a qualified archaeologist to review development projects in the city. The contract archaeologist would implement City policies and procedures as authorized by City Council. Clark County, Washington, for example, has a contract archaeologist that reviews development plans for compliance with County policies and procedures related to archaeological resources. At present, there is no budget commitment for such a position with the City of Portland.

CONCLUSION

The ESEE analysis states that full and partial protection levels are needed for the archaeological resources program. From the conflicting use analysis, it is clear that the City cannot rely on acquisition to protect all archaeological resources. Since this plan limited is to the Columbia South Shore plan district, the most direct way to tailor zoning regulations is to amend the plan district zoning regulations. Plan district amendments address the environmental zones, particularly the effect of "p" zone boundary changes that would remove current protection to archaeological resources. The code amendments may make use of conservation easements to assure certain protections without disclosing site locations. The City should also encourage acquisition as a means to limit conflicting uses.

In addition, a concern about archaeological resource protection has been what would be the economic impact on affected properties within the plan district. This concern comes from two perceived uncertainties with regard to the Columbia South Shore. First, how many properties require further confirmation testing and, second, how will the plan address management of properties with identified archaeological resources. Figure 24, shown below, addresses each uncertainty and quantifies the actual number of affected properties.

It is important to note that the areawide archaeological investigation has been able to reduce the areas subject to Goal 5 analysis and possible resource protection. The resulting three sensitivity areas cover approximately 600 acres (out of a possible 2,800 acres). Thus, close to 2,200 acres of the plan district lie outside the sensitivity areas, and are excluded from further analysis.

Furthermore, the figure identifies the overlap between identified archaeological resources, environmental ("p" or "c") zones and properties subject to proposed archaeological resource protection measures. Protection measures include confirmation testing to fill in gaps in subsurface probes and protection measures that address management of identified archaeological resources. As can be seen in Figure 24, a total of 8 properties need further confirmation testing and only 9 properties contain confirmed, intact archaeological sites, for a total of 17 affected properties. In summary, the ESEE analysis establishes the importance of providing some level of protection for affected properties while allowing substantial development opportunities.

Figure 24: Properties Affected by Archaeological Resources Protection Plan

Properties ¹ Needing Further Confirmation Testing			Properties With Identified Archaeological Resources ²			
Sensitivity Area	All "p" zone ³	Partial "p" zone	No "p" zone	All "p" zone	Partial "p" zone	No "p" zone
Area #1 Historic Lakes	0	0	0	0	1	3
Area #2 River's Edge	0	0	1	0	0	2
Area #3 Columbia Slough	3	4	1	0	1	0
Totals	3	4	2	0	2	5

- 1 "Properties" mean current ownerships in the plan area.
- 2 "Identified archaeological resources" means one of the four resource types defined in the general ESEE analysis (Chapter 9, page 131 of this report).
- 3 "P" zone refers to the environmental protection zone, as shown on official zoning maps.

The city's archaeological plan should closely correspond with the state archaeological inventory. The city's protection measures should make use of SHPO's recorded site records.

This plan anticipates new archaeological studies, and periodic updates of the plan to maintain the close correspondence between state and city inventories. Some of the studies may be required to complete a minimum level of subsurface testing in high probability areas. Other archaeological studies may be initiated voluntarily. A first step is for the archaeological site's status--its significance or site boundaries.

The implementation measures addressed in this chapter include:

- 1) **An amendment to Portland's Comprehensive Plan Goals and Policies**, to reflect completion of the *Archaeological Resources Protection Plan for the Columbia South Shore*;
- 2) **Amendments to Title 33, Planning and Zoning**, to implement the *Archaeological Resources Protection Plan for the Columbia South Shore*; and
- 3) **Amendments to the Official Zoning Maps**, to apply the archaeological resources protection zones to designated resource areas and to remove the Interim Resource Protection Zone ("sec") from zoning maps in the plan area.

1) AMENDMENTS TO COMPREHENSIVE PLAN GOALS AND POLICIES

In 1993, City Council amended the Columbia South Shore plan district to adopt zoning standards intended to encourage high quality development in the Columbia South Shore. The so-called Development Standards project created streetscape standards for NE Airport Way and NE Marine Drive, within the plan district. One of the outcomes of the Development Standards project was to expand the Comprehensive Plan Policy 5.20 (then 5.10), Columbia South Shore, to set a target date to adopt a Cultural [Archaeological] Resources Protection Plan for Columbia South Shore. This plan and the recommendations of this chapter satisfy that policy commitment.

At that time, Objective 5.20.C. (now 5.10.C.) was amended to add the sentence "Adopt a Columbia South Shore Cultural Resources Protection Plan by April 1, 1995." The Bureau of Planning has since renegotiated the completion date with the Oregon Department of Land Conservation and Development (DLCD). Factors in this decision include startup dialogs to secure project funding, inclement weather conditions during archaeological fieldwork, the mismatch between archaeological resources and current Goal 5 administrative rule, and the Bureau's interest in seeking advice from key stakeholders on the Cultural Resources Advisory Committee.

With this plan, City Council amended Comprehensive Plan Objective 5.10.C., as follows:

5.10 Columbia South Shore

Encourage the development of the Columbia South Shore as an industrial employment district which attracts a diversity of employment opportunities while protecting significant environmental resources and maintaining the capacity of the area infrastructure to accommodate future development.

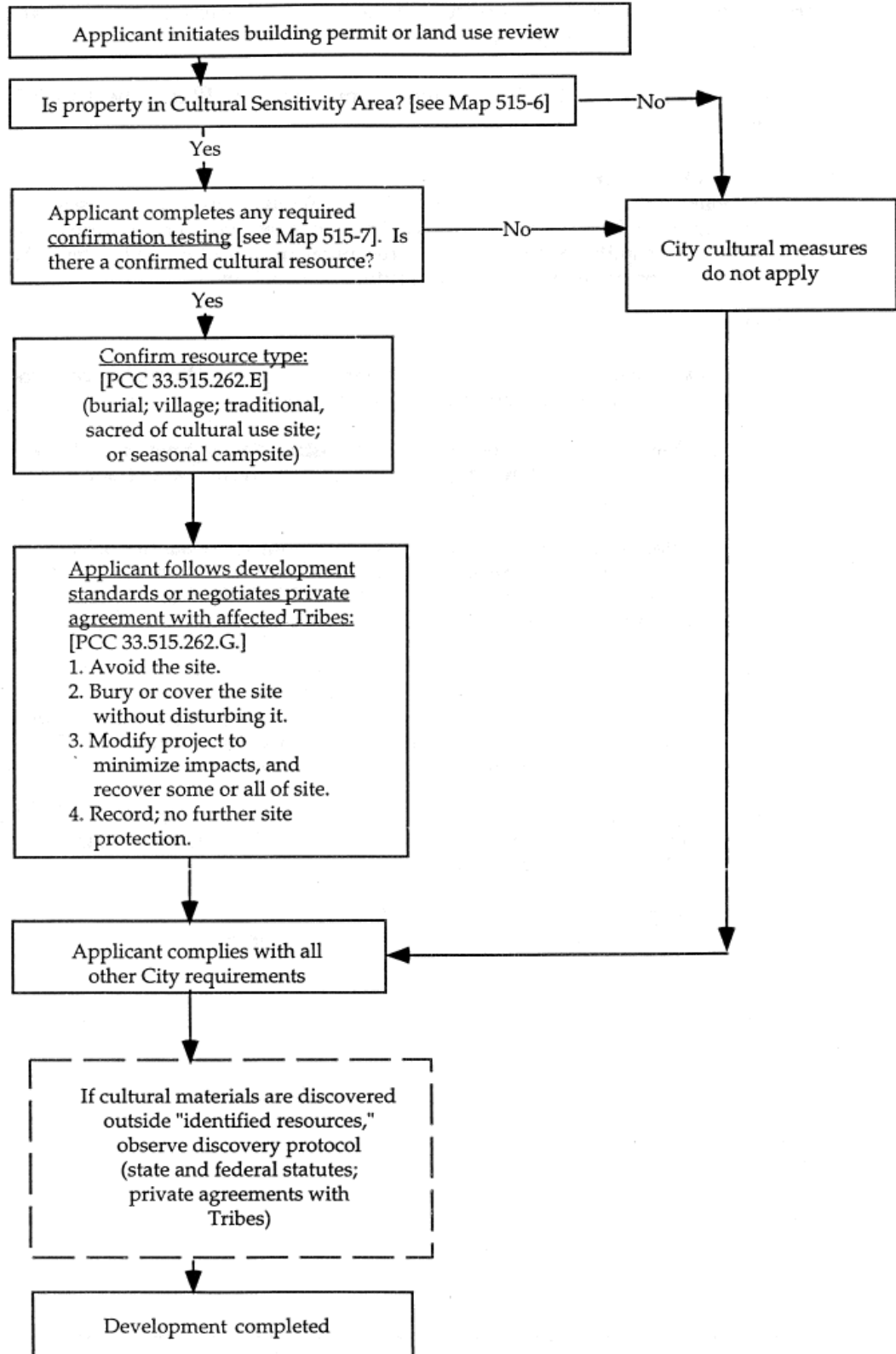
Objectives:

- A. Designate the bulk of the South Shore district for industrial development opportunities, particularly large sites (over 30 acres).
- B. Allow a mix of business park and industrial development near the Airport Way and I-205 interchange, along Airport Way, and at entrances to the South Shore Industrial District.
- C. Protect and enhance the scenic and environmental qualities of Marine Drive, the area's sloughs, areas providing significant wildlife habitat, and

archaeological resources. Adopt a Columbia South Shore Cultural Resources Protection Plan, by April 1, 1995.

- D. Protect ground water resources, particularly the city's domestic water supply.
- E. Designate and build recreation facilities in the Columbia South Shore for walkers, hikers, runners, bicyclists, and canoeists. Improve bicycle and pedestrian connections between the district and residential areas to the south.
- F. Protect the transportation capacity of the area's highways and roads through both review of individual projects and identification and construction of new facilities which increase the system's capacity.
- G. Recognize the importance of Portland International Airport and other regional transportation facilities to the South Shore district.

Figure 25: Decision Steps To Determine Level of Protection (Management Measures) for Archaeological Sites



2) AMENDMENTS TO TITLE 33, PLANNING AND ZONING

This section describes specific changes to the zoning code for purposes of implementing the *Archaeological Resources Protection Plan for the Columbia South Shore*. The purpose of the Plan is to protect significant scientific and heritage values associated with archaeological resource sites in the plan district. Plan implementation is based on the decision-making framework presented in Figure 25, at left. Amendments to the City zoning code to implement the *Archaeological Resources Protection Plan for Columbia South Shore* are presented below.

These amendments were adopted by City Council on April 3, 1996. On June 5, 1996, City Council amended Map 515-7 to recognize the completion of sample testing (called “confirmation testing”) which was in progress on two properties during the later stages of public review of this plan. Map 515-7 reflects this amendment. Also adopted on June 5 were several changes to punctuation, cross-reference, and word choice in the Columbia South Shore Plan District (Chapter 33.515). These format changes did not affect the content or process of plan district provisions, including archaeological resource measures shown in this section.

The 2004 Update resulted in amendments to two plan districts: Columbia South Shore (PCC 33.515) and Cascade Station/Portland International Center (PCC 33.508). The amendments replaced "cultural" with "archaeological". The following section shows amendments to one of these plan districts.

2a) Amend Chapter 33.515, Columbia South Shore Plan District, as follows:

Sections:

General

33.515.010 - 33.515.030 [no change]

Use Regulations

33.515.100 - 33.515.130 [no change]

Development Standards

33.515.200 - 33.515.260 [no change]

33.515.262 ~~Interim~~ Archaeological Resource Protection

Environmental Zones

33.515.265 Purpose

33.515.268 - 33.515.278 [no change]

33.515.280 Columbia South Shore Environmental Review

Map 515-1 Columbia South Shore Plan District and Subdistricts

Map 515-2 ~~Areas Affected by~~ Columbia South Shore Streetscape Standards

Map 515-3 Maximum Building Heights

Map 515-4 Columbia South Shore Slough Trail

Map 515-5 Environmental Transition Areas

Map 515-6 Areas of Archaeological Interest in Columbia South Shore

Map 515-7 Areas Where Confirmation Testing is Required

Existing code language (retain or ~~delete~~). Recommended new language.

Commentary

- A. Purpose. The purpose of these amendments is to implement the Archaeological Resources Protection Plan for Columbia South Shore (hereafter, ARPP). That plan, in turn, seeks to protect significant heritage and scientific values associated with archaeological resources located in the Columbia South Shore plan district. The ARPP was developed in response to the City's periodic review requirement to comply with State Goal 5. The ARPP is guided by Comprehensive Plan Policy 5.10, Columbia South Shore. Amendments to the Zoning Code implement the CRP and help achieve its goals and purposes.
- B. Archaeological resource values. The focus of attention is on Indian-use sites from the pre-contact period. That is, the time before Euro-Americans encountered the American Indians. The interest is in protecting the heritage for descendants of those Indians, and in informing the general public of past events that are not well documented or understood. In the year 2005, the City of Portland may celebrate 200 years from the time that Meriweather Lewis and George Clark first explored the lower Columbia River basin, including the south shores of the Columbia River.

33.515.010 - 33.515.260 [No change]

33.515.262 Interim Cultural Archaeological Resource Protection

A. Purpose. ~~The City has initiated a process to protect cultural resources in the Columbia South Shore. When the process is complete, the interim protection measures will be deleted from the zoning code.~~ Archaeological evidence has confirmed that American Indians used the plan district prior to entry of Euro-Americans to the Portland area. Archaeological resources have historic, cultural and scientific value to the general public and heritage value to associated tribes, whose ancestors lived in the plan district area and harvested local natural resources for subsistence and spiritual/ceremonial uses. Of special concern is the potential for ground disturbance activities to uncover human remains and archaeological resources that may be eligible for listing on the National Register of Historic Places. Specific purposes of this section are to:

- Protect inventoried significant archaeological resources and their functional values in the Columbia South Shore plan district in a way that increases certainty of development potential;
- Promote compliance with state and federal laws intended to protect archaeological resources, including the state archaeological permit process and federal grave protection laws;
- Encourage coordination between property owners, appropriate tribal governments, City, state and federal agencies regarding archaeological resources;
- Encourage the development community and archaeologists to file site records with the State Historic Preservation Office (SHPO);
- Limit disclosure of archaeological resource records to protect confidentiality and discourage the destruction of archaeological resources; and
- Provide a process for developers and appropriate tribes to explore alternatives to full protection of archaeological resources, such as conservation easements.

B. Archaeological resource values. For purposes of this section, an archaeological resource is a resource identified through a SHPO archaeological permit process relating to use by American Indians before the entry of EuroAmericans to the Portland area. These archaeological resources have strong heritage and scientific values as identified in the *Archaeological Resources Protection Plan for Columbia South Shore*. Much of the plan district has been inventoried.

Commentary

~~C. Interim resource protection review.~~ The interim resource protection ("sec") review for archaeological resources is no longer needed with the adoption of the enclosed code amendments. The "sec" review was initially applied by Multnomah County throughout Columbia South Shore (and elsewhere) to protect a broad range of State Goal 5 resources. With adoption of natural and scenic resource protection measures (and now, archaeological resource protection measures), the "sec" overlay can be removed from zoning maps of the plan area.

Extensive archaeological investigations of Columbia South Shore and historical research into environmental features allow us to identify areas most suitable for American Indian use sites. The *Archaeological Resources Protection Plan for Columbia South Shore* identifies three such "sensitivity areas." The River's Edge includes the Columbia River shoreline, where Indians likely lived in relatively permanent villages. The second sensitivity area is the Columbia Slough. To harvest inland roots and plants, American Indians probably traveled along the Columbia Slough system. Nearby grasslands formed suitable sites for seasonal campsites and activity areas (tool-making and food processing areas). Third, the Historic Lakes Sensitivity Area, located off the Columbia Slough, offered two large lakes from which to gather plants, fish and hunt waterfowl. Burial sites may be found in any of the sensitivity areas.

C. Where the regulations apply. The recommended code amendments apply to identified archaeological resources (Subsection D defines this term). Archaeological resources may be identified from past investigations and from future "confirmation testing" to fill in gaps in auger probes within high probability areas. Confirmation testing is further explained in Subsection D.6.

C. Interim resource protection review. ~~The approval criteria for the interim resource protection review are limited to the following criteria. Other approval criteria of Chapter 33.455 do not apply in this plan district. An interim resource protection review application will be approved if the review body finds that the applicant has shown that all of the approval criteria stated below are met:~~

- ~~1. Archaeological areas must be preserved for their historic, scientific, cultural value, and protected from vandalism or unauthorized entry; and~~
- ~~2. Extraction of aggregates and minerals, the depositing of dredge spoils and similar activities must be conducted in a manner designed to minimize adverse effects on water quality, fish and wildlife, historic or archaeological features, vegetation, erosion, stream flow, visual quality, noise and safety, and to guarantee necessary reclamation; and~~
- ~~3. Buildings, structures and sites of historic significance must be preserved, restored, and maintained.~~

C. Where the regulations apply. ~~The regulations of this Section apply to sites in the Interim Resource Protection Overlay Zone. The requirements of this section apply to:~~

1. Archaeological resources identified in the *Archaeological Resources Protection Plan for Columbia South Shore* within the Archaeological Sensitivity Areas shown on Map 515-6 at the end of this chapter; and
2. Properties for which additional confirmation testing is required, as shown on Map 515-7. When confirmation testing has been completed, this section only applies to archaeological resources identified as part of that testing.
3. The requirements of this section do not apply to sites or portions of sites where no archaeological resources have been identified and no additional confirmation testing is required.

Commentary

D. Identification of archaeological resources. This subsection defines terms for the archaeological resources section of the zoning code, including "archaeological resources," "confirmation testing" and "qualified archaeologist."

D.1. Purpose. Sample testing in advance of project construction serves to protect archaeological resources and provide more certainty of resource locations for the development community. As a sampling technique, confirmation testing does not identify all archaeological resources, but may reduce the chances of inopportune discovery.

D.2. Use of SHPO records and procedures. This plan builds on an existing program that issues state archaeological permits on public and private lands. The SHPO is a federally-funded program that operates out of the State Parks and Recreation Department. The SHPO issues permits only to qualified archaeologists. The Commission on Indian Services is another state agency that advises other state agencies on the appropriate Oregon tribes to consult.

The Planning Commission added "traditional, sacred or cultural use site" as a resource type, at the request of two tribes. As defined in Subsection E.5, this resource type might include a vision quest site or sweat lodge site. Written documentation would be submitted through the state archaeological permit process.

D.3. Discovery during project construction. Staff found that the current administrative rules for State Goal 5 do not allow a local jurisdiction to add new resource sites discovered during project construction to its inventory without going back and legislatively amending its Goal 5 inventory. This plan requires confirmation testing for specified areas already identified most suitable for Indian use (untested areas of archaeological sensitivity areas).

D.4. State archaeological permit. The applicant should be aware that an Oregon state archaeological permit may also be needed prior to project construction.

D. Identification of archaeological resources.

1. Purpose. There is a public interest in testing for archaeological resources prior to project construction. The earlier an archaeological resource is found and evaluated, the better are chances that reasonable development proceeds without delay and the archaeological resource is protected. Confirmation testing can reduce the chances that archaeological resources are encountered during project construction. Much of the plan district has already received confirmation testing using a consistent methodology. This section requires that applicants fill gaps in confirmation testing within archaeological sensitivity areas.

2. Use of state SHPO records and procedures for this section.

a. "Archaeological resource" is a resource identified through a SHPO archaeological permit process. An archaeological resource must meet one or both of the following:

•an archaeological site that meets SHPO guidelines, plus a five foot vertical buffer and a five foot horizontal buffer, as shown in Figure 515-6, Archaeological Resource Subareas. The vertical buffer extends directly above the most shallow archaeological materials found in the site records. The horizontal buffer extends sideways from the archaeological resource; and/or

•a traditional, sacred or cultural use site, as documented in writing by an appropriate Oregon tribe through a SHPO permit.

b. The SHPO maintains a list of "qualified archaeologists" knowledgeable in American Indian lifeways of the lower Columbia River of the pre-contact period, and determines if an "identified archaeological resource" exists on the subject property. "Consultation with Oregon tribes" means following SHPO procedures for consultation on state archaeological permits.

c. The Commission on Indian Services identifies the "appropriate Oregon tribes."

d. All auger probes filed with the SHPO by a qualified archaeologist count toward fulfilling the requirements of this section.

3. Discovery during project construction. The zoning code does not address new discoveries of archaeological resources found during project construction. The applicant should be aware of state and federal regulations that apply to such discoveries.

4. The applicant should check with the SHPO archaeologist as to whether a state archaeological permit is needed.

Commentary

D.5. Confirmation testing not required. Map 515-7, at the end of the plan district, shows where and how many auger probes are required. If a site is not identified for confirmation testing (on Map 515-7), then the City does not require further confirmation testing. However, a resource recovery plan for an identified archaeological resource may also involve additional archaeological testing (methods may include auger probes, shovel test excavations or test pits). Staff will also maintain a confidential zoning atlas with confirmation testing areas and identified archaeological resources (see Subparagraph H.2.a).

D.5.a. A large part of Columbia South Shore is located outside of the "archaeological sensitivity areas" and is not subject to City archaeological resource measures.

D.5.b. This provision gives the applicant two options for written documentation of archaeological resources on their sites, one from SHPO and another from the Bureau of Planning. There is an administrative cost to the issuing agency, to conduct research, prepare the letters and retrieve those letters upon request. In Subparagraph H.1.b, the applicant learns what special site plan materials must be provided for sites with identified archaeological resources.

D.6. Confirmation testing required. This provision tells the applicant how many and where auger probes (if any) are required, and who qualifies to provide the testing.

5. Confirmation testing not required.

a. For sites located outside an "archaeological sensitivity area" as shown on Map 515-6, the requirements of this section do not apply.

b. For sites located within an "archaeological sensitivity area" as shown on Map 515-6 and not designated "confirmation testing required" on Map 515-7, the applicant must either provide written documentation that there is no archaeological resource on the site or meet the regulations of this section. To qualify for exemption from this section, such written documentation must specify that confirmation testing of the site is complete and that no archaeological resource was identified. The written documentation may be a certification letter from SHPO or a zoning confirmation letter from the Portland Bureau of Planning.

6. Confirmation testing required. Additional auger testing is required for sites with some property designated "confirmation testing required" on Map 515-7 at the end of this chapter. Prior to development, the applicant must conduct confirmation testing to determine the location and type of any archaeological resources identified on the site through current or previous archaeological testing. Confirmation testing, consisting of subsurface auger probes and consultation with appropriate Oregon tribes, must meet all the standards of this paragraph. The standards are:

a. A qualified archaeologist, in consultation with appropriate Oregon tribes, must perform the confirmation testing. A list of qualified archaeologists is maintained by the SHPO.

b. Subsurface auger probes must be placed along the Marine Drive levee or the bank of the Columbia Slough, as applicable. Auger probes must be placed at least 100 feet apart and, where feasible, reach a ground depth of at least 8 feet below grade. The qualified archaeologist will determine the precise location of auger probes, consistent with previous confirmation testing in the vicinity.

c. If an archaeological resource is identified through confirmation testing, the standards for that resource and associated transition area found in Subsection G, below, apply. If no archaeological resource is identified through the testing, the standards of Subsection G do not apply.

Commentary

E. Archaeological resource classification. This subsection provides a classification system for archaeological resources. The Planning Commission recommends three changes to the original staff proposal (12/12/95). First, "village" is modified slightly, in response to comments from tribal representatives and archaeologists. Second, a fourth resource type (traditional, sacred or cultural use site) is added to the plan inventory and the code language. Third, a new Paragraph E.6 is added to clarify the relationship between resource types.

E. Archaeological resource classification. Where an archaeological resource has been identified, through previous testing or confirmation testing, a qualified archaeologist must classify the archaeological resource using cumulative archaeological test results for the site. The archaeological resource will be classified as one or more of these types:

1. Burial. A burial is an archaeological resource where there is evidence of human remains or funerary objects, as defined in Oregon Administrative Rules.

2. Village. A village is an archaeological resource where there is evidence of a relatively permanent residential location typically occupied during the winter and on an annual basis. Archaeological evidence may include remains of structures, storage pits and midden deposits.

3. Seasonal campsite. A seasonal campsite is an archaeological resource where there is evidence of organized activity in extracting and processing resources on a seasonal basis.

4. Activity area. An activity area is an archaeological resource where specific activity (e.g., roasting camas bulbs or stone tool making) took place.

5. Traditional, sacred, or cultural use site. A traditional, sacred, or cultural use site is an archaeological resource where there is evidence of a sacred or ceremonial site, and may include vision quest sites, sites of other sacred ceremonies, and sweat lodge sites.

6. Where more than one archaeological resource is identified. Where more than one archaeological resource is identified together:

a. If one of the archaeological resources is a burial, the regulations for burials apply to all resources;

b. If any of the archaeological resources are villages, or traditional, sacred, or cultural use sites, and there is no burial, the regulations for villages, or traditional, sacred, or cultural use sites apply to all resources;

c. If all of the archaeological resources are seasonal campsites or activity areas, the regulations for seasonal campsities or activity areas apply to all resources.

Commentary

F. Resource subareas. As with the environmental zones, there is a resource area and a transition area, which is shown as Figure 515-6.

F.1. Archaeological resource. The City relies on the SHPO archaeological permit process to identify archaeological sites that meet SHPO guidelines and to provide documentation of any sacred or ceremonial use areas. To identified archaeological sites, we add a five foot buffer to account for the occasional construction equipment and other activities that stray beyond the areas approved for excavation. The archaeological resource area should be cordoned off to keep unauthorized equipment and activities out of that area.

F.2. Transition area. The transition area extends above and sideways from the archaeological resource for a specified distance. Burials; villages; and traditional, sacred and cultural use sites need a 100-foot wide transition area (the maximum spacing between auger probes) because additional archaeological materials may be encountered outside resource boundaries. For burials, a group burial may be found in the vicinity of an identified individual burial. For villages and traditional, sacred and cultural use sites, associated ("satellite") features may be encountered outside site boundaries. For instance, features associated with a village are harder to recognize through auger and shovel test excavations than are the primary structures of that village. Should a more detailed archaeological investigation of that village or traditional use site occur at a later date, the wider transition area will allow the archaeologist to cover the possible extent of associated features.

A more narrow transition area is provided for seasonal campsites. Seasonal campsites typically supported fewer people for a shorter period of time than for villages. Given the more limited extent of seasonal campsites, the transition area does not need to be as wide as with villages.

F. Archaeological resource subareas.

1. Archaeological resources. An archaeological resource is a resource identified through a SHPO archaeological permit process. An archaeological resource must meet one or both of the following:

a. an archaeological site that meets SHPO guidelines, plus a five foot vertical buffer and a five foot horizontal buffer, as shown in Figure 515-6, Cultural Resource Subareas. The vertical buffer extends directly above the most shallow archaeological materials found in the site records. The horizontal buffer extends sideways from the archaeological resource; and/or

b. a traditional, sacred or cultural use site, as documented in writing by an appropriate Oregon tribe through a SHPO permit.

2. Transition area. The transition area is the area directly between the archaeological resource and the surface layer and extends horizontally out from the edge of the archaeological resource. Features associated with a resource, not identified through auger testing, may also be encountered in the transition area.

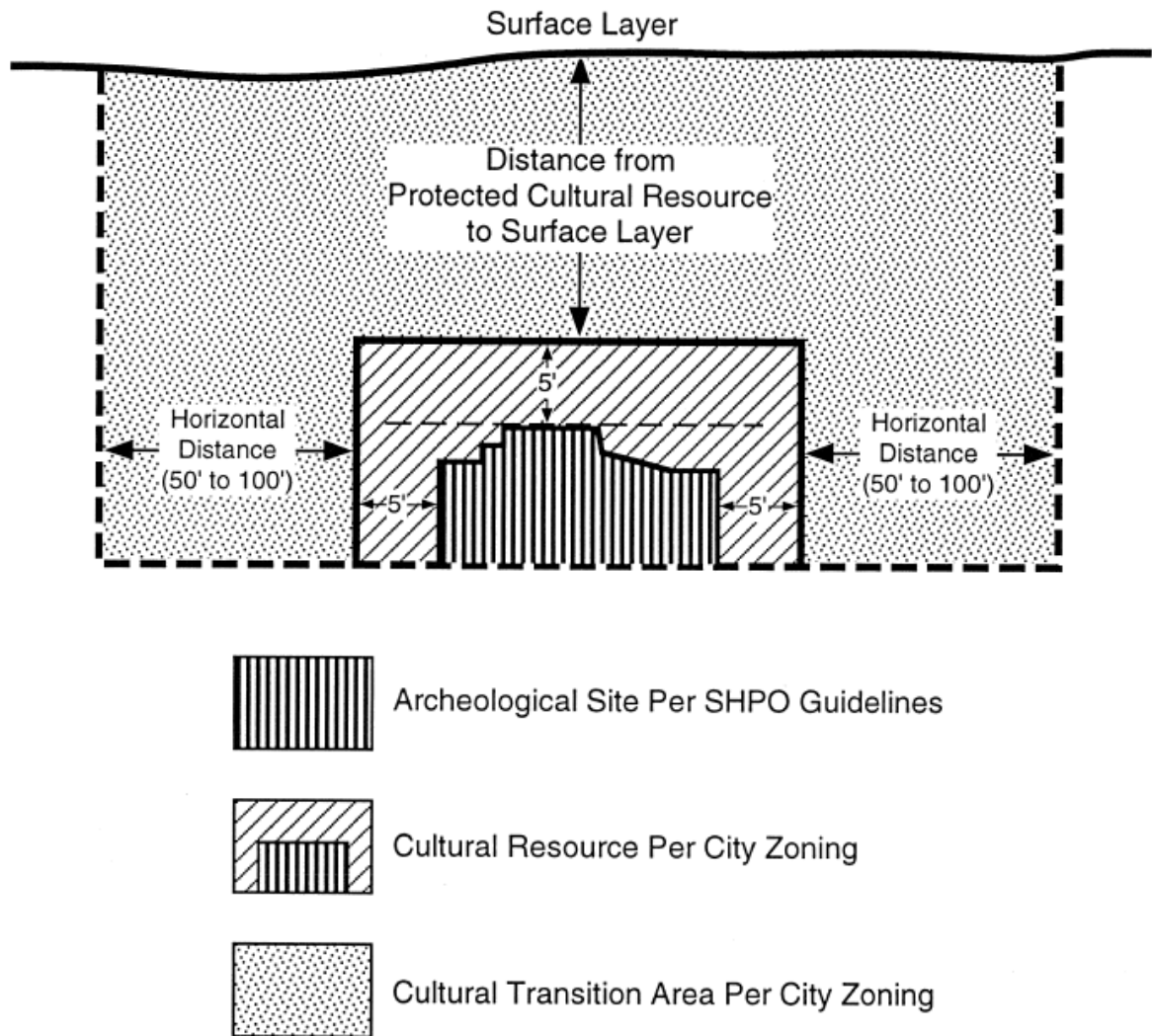
a. For burials and villages, the horizontal distance is 100 feet from the archaeological resource.

b. For seasonal campsites; activity areas; and traditional, sacred, or cultural use sites, the horizontal distance is 50 feet from the archaeological resource.

Commentary

Figure 515-6 shows how to measure the archaeological resource (using archaeological site boundaries). The five foot buffer is not added to a traditional, sacred or cultural use site.

Figure 515-6: Archaeological Resource Subareas



Commentary

G. Protection of identified archaeological resources. This subsection tells what protection measures apply, depending on the resource type and proposed development.

G.1. Protection measures are shown in Table 515-1 and numbered text that follows that table. The highest protection level is for burials; the second highest protection level is for villages and traditional, sacred and cultural use sites. Two tribes have stated that any burials must be protected in place. The second highest protection level allows resource recovery by a private agreement (MOU), as described in Paragraph *G.6* below.

G. Protection of identified archaeological resources.

1. Ground disturbance activities within the archaeological resource and transition area are either allowed, limited or prohibited, depending on the resource type. Table 515-1 provides a summary of the standards. Activities shown with a "Y" are allowed if they comply with other use and development standards of this Title. Activities shown with an "MOU" are allowed through a private agreement specified in Paragraph G.6, below; without that private agreement, such activities are prohibited. The footnote letters from Table 515-1 refer to subparagraphs of Paragraph G.6, below. Activities shown with an "N" are prohibited.

Table 515-1: Archaeological Resource Protection by Resource Type

Ground Disturbance Activities	Burial		Village; or Traditional, Sacred or Cultural Use Site		Seasonal Campsite or Activity Area	
	Resource	Transition	Resource	Transition	Resource	Transition
Ongoing and low-impact activities (33.575.262.G.4)	N	Y	Y	Y	Y	Y
Parking lots and vehicle circulation areas (33.515.262.G.4.j and 33.515.262.G.6)	N	Y	N/MOU [a]	Y	N/MOU [b]	Y
All other activities otherwise permitted	N	N	N/MOU [a]	N/MOU [a]	N/MOU [b]	N/MOU [b]

Y = Yes, Allowed

N/MOU = Private agreement option; otherwise, prohibited

N = No, Prohibited

For [a] see Subparagraph G.5.a.

For [b] see Subparagraph G.5.b.

Commentary

G.2 To provide more site flexibility, three development standards of the base zones are reduced.

G.3., G.4. Certain ongoing and low-impact activities pose little potential impact on buried archaeological resources. Out of respect for the dead, these activities are prohibited within resource boundaries of burials. To date, no burials have been recorded in the plan area.

2. For sites with identified archaeological resources, the base zone development standards are modified as follows:

- a. Minimum building setbacks are reduced to zero;
- b. Minimum number of off-street parking spaces is reduced to zero; and
- c. For purposes of meeting the minimum landscaping requirements, the applicant may exclude the area occupied by the archaeological resource from the total site area.
- d. The area occupied by the archaeological resource is exempt from the standards of 33.515.215, Marine Drive Streetscape.

3. For archaeological resource areas of burials, all ground disturbance activities are prohibited.

4. Except for archaeological resource areas of burials, the following ongoing and low-impact activities are allowed in archaeological resources and transition areas:

- a. Maintenance, repair, and replacement of existing structures, exterior improvements, roads, and utilities when the activity does not enlarge the ground disturbance area horizontally or vertically;
- b. Lawns and landscape areas, including the installation of new irrigation and drainage facilities and new erosion control features;
- c. Change of crop type or farming technique on land currently in agricultural use;
- d. Alterations of buildings which do not increase building coverage and meet all development standards of the base zone;
- e. Operation, maintenance, and repair of the following existing facilities: irrigation systems, drainage facilities and conveyance channels, stormwater detention areas, pumping stations, erosion control and soil stabilization features, and pollution reduction facilities. Maintenance of drainage facilities includes the dredging and channel cleaning of existing drainage facilities and vegetative maintenance within the minimum floodway cross section of drainageways where all spoils are placed outside environmental zones and sensitivity areas;
- f. Removing a tree listed on the Nuisance or Prohibited Plant Lists;
- g. Construction of the Columbia Slough recreational trail, as identified in Section 33.515.260 of this chapter;

Commentary

G.5. Activities otherwise permitted. This category of activities covers a broad range of new construction activities, including buildings, sewer and water lines.

G.6. The MOU is a private agreement between the applicant and the appropriate Oregon tribe(s) establishing a resource recovery plan. To secure the MOU, the applicant negotiates directly with the appropriate Oregon tribes. The MOU is a flexible, confidential tool to achieve a balance between resource protection and development. The applicant submits evidence that a resource recovery plan has been signed by the applicant and appropriate tribes. Participating tribes are accustomed to MOU's. The primary alternative to an MOU, for a tailored result, is a land use review. A discretionary land use review is ill-suited to archaeological resource protection because its public notice and site plan components may result in disclosing resource locations.

h. Planting of native vegetation listed on the Portland Plant List when planted with hand held equipment; and

i. Public street and sidewalk improvements that do not enlarge the ground disturbance area horizontally or vertically.

5. All activities otherwise permitted by other regulations of this Title. All activities otherwise permitted, other than ongoing and low-impact activities listed in Paragraph G.4 above, are prohibited within archaeological resource and transition areas of villages; seasonal campsites; activity areas; and traditional, sacred, or cultural use sites, except:

a. Activities listed in Paragraph G.4 are allowed;

b. Activities allowed through an archaeological resource recovery plan, as provided in Paragraph G.6 below; and

c. Construction of a parking lot or vehicle circulation area within the transition area is allowed.

6. Archaeological resource recovery. This regulation applies to all archaeological resource and transition areas of Table 515-1 that have a "MOU". For villages; seasonal campsites; activity areas; and traditional, sacred or cultural use sites, the applicant must protect the archaeological resource areas either by prohibiting all ground disturbance activities or complying with a private agreement for archaeological resource recovery, as stated in this Paragraph.

a. For villages and traditional, sacred or cultural use sites, an archaeological resource recovery plan is limited to the removal of archaeological materials necessary to construct a paved parking lot or vehicle circulation area. The paved area must provide spill containment so that chemicals do not degrade the remaining archaeological resource.

b. For seasonal campsites and activity areas, an archaeological resource recovery plan may remove some or all archaeological materials, as negotiated with the appropriate tribes and specified in the archaeological resource recovery plan.

Commentary

G.6.c. For resource recovery, the applicant engages a qualified archaeologist and consults with the appropriate tribes for a private agreement.

c. An archaeological resource recovery plan allows for the removal of archaeological materials following an archaeological evaluation, a consultation process with appropriate Oregon tribes and a private agreement (Memorandum of Understanding) between the applicant and tribes. Each step is described below.

(1) Archaeological evaluation. A detailed archaeological evaluation must be completed. The evaluation must be conducted by a qualified archaeologist. The evaluation must meet standards of the SHPO for archaeological resource recovery projects.

(2) Consultation with appropriate tribes.

- The applicant must contact the appropriate tribes for the area, by registered or certified mail, to request comments on archaeological testing and offer a meeting. The Commission on Indian Services determines the appropriate Oregon tribes to be consulted.

- The tribes should reply to the contact within 14 days and hold a meeting within 30 days of the date of the initial contact. If the appropriate tribes do not reply within 30 days, the applicant may apply for a state archaeological permit and implement the terms of that permit without further delay. The tribes may schedule the meeting with a tribal council, one of its committees or designee.

- The purpose of the meeting is to allow tribal representatives and the applicant to review archaeological test results and discuss the archaeological resource recovery plan. More than one meeting may be held.

- After the meetings, and before applying for a building permit, the applicant must send a letter to the tribal governments. The letter will explain any changes in the project's design and archaeological resource recovery plan since the date of the last meeting.

(3) Development of a Memorandum of Understanding (MOU). The applicant must develop a Memorandum of Understanding (MOU) signed by the applicant, the property owner, and at least one appropriate Oregon tribe. The MOU must specify the care and disposition of any archaeological materials recovered on the site. The MOU must also specify how the parties will communicate and how on-site monitoring will proceed during project construction.

Commentary

H. Application, review and inspection. Section H describes additional application requirements, review procedures, and compliance reports which apply to applicants with identified archaeological resources or applicants where additional confirmation testing is required.

H.1. Supplemental application requirements. For applicants within an archaeological sensitivity area, applications must include written documentation from the Bureau of Planning or State Historic Preservation Office (SHPO) indicating that no archaeological resources were found, or the items listed in Subsection H.1.b: a site plan; a confirmation testing overlay; an archaeological resource overlay; and (if applicable) an MOU.

The Bureau of Planning will maintain a map atlas of identified archaeological resources. These maps are based on the area-wide inventory, plus updates submitted to the Bureau of Planning as of the adoption date of the archaeological plan. The Bureau will make notations on the map atlas to reflect new information from confirmation testing, including archaeological resources identified through that testing.

H. Application, Review, and Inspection.

1. Supplemental application requirements.

a. No archaeological resource found. For sites within an "archaeological sensitivity area" as shown on Map 515-6, the applicant is responsible for providing any evidence that no archaeological resource was found.

(1) For sites not designated "confirmation testing area," the applicant must provide written documentation in the form of a certification letter from SHPO or a zoning confirmation letter from the Portland Bureau of Planning.

(2) For sites that require confirmation testing, and the testing did not find an archaeological resource, the applicant must submit a report by a qualified archaeologist regarding the results of confirmation testing and the presence of identified archaeological resources on the site.

b. Archaeological resource found. The applicant must provide the following supplemental information. In the interest of not disclosing the location of archaeological resources, all maps required in (2) through (4) below will be stamped "Confidential: Sensitive Information". Planning staff will separate this information and file it in a locked file subject to nondisclosure procedures.

(1) Site plan. A site plan, at a scale of 1 inch = 50 feet or larger, showing the building footprints, underground utilities and all other proposed ground disturbance activities and an estimated ground disturbance depth. The site plan must show the existing topography of the site.

(2) Confirmation testing overlay. For sites identified for confirmation testing, a transparent overlay map showing all of the archaeological auger locations completed for the site.

(3) Archaeological resource overlay. A transparent overlay showing the boundaries of any archaeological resources that are recorded with SHPO or encountered during confirmation testing. The archaeological resource overlay must also show the transition area associated with each archaeological resource. Any conservation easements intended to protect archaeological resources must be shown on this overlay.

(4) For archaeological resource recovery plans, letters to tribal governments and Memoranda of Understanding signed with tribal governments must be filed with the building permit.

Commentary

- H.2. Review of applications. The City relies on the applicant to submit more recent archaeological reports that may affect the finding of archaeological resources on the site.
- H.3. Compliance reports. This subsection describes compliance reports that may apply to an MOU or other developments. In the case of the MOU, the form of compliance reports and inspections is specified in the resource recovery plan. For all other developments, a qualified archaeologist submits compliance reports to the Bureau of Buildings. There is a need to rely on a special inspector because City staff does not have the expertise needed to confirm compliance.

c. It is the applicant's responsibility to provide any archaeological reports filed with SHPO after July 1, 1994 to verify changes to the state's inventory affecting the development site. The Bureau of Planning will maintain a confidential atlas of identified archaeological resources within the archaeological sensitivity areas shown on Map 515-6 at the end of this chapter.

2. Review of applications.

a. Where a qualified archaeologist, in consultation with the appropriate Oregon tribes, certifies that no archaeological resources were found through confirmation testing required by this section, the Bureau of Planning will provide a letter to the applicant waiving any additional compliance with this section.

b. The Bureau of Planning may contract with a qualified archaeologist to assist the City in review and inspection of proposals.

c. The SHPO maintains a list of qualified archaeologists.

d. An additional fee for special archaeological evaluations and inspections may be charged to the applicant for any grading permit or building permit.

3. Compliance reports. For ground disturbance in an archaeological resource or transition area, the applicant must provide documentation that the approved resource recovery plan or other development activities comply with plans submitted for Subsection H.1.b.

a. Archaeological resource recovery plans. The required documentation for resource recovery plans are specified in the signed MOU.

b. All other developments. For developments not covered by a signed MOU, the applicant must submit compliance reports from a qualified archaeologist to the Bureau of Buildings. The archaeologist must submit a final signed report certifying that the work was in conformance with this section.

Commentary

33.515.265 The Archaeological Resources Protection Plan recognizes the "p" zone as a protected area for archaeological resources. In other words, the "p" zone serves to limit ground disturbance activities that may threaten an archaeological resource. To date, three archaeological sites which meet SHPO guidelines have been confirmed in the "p" zone.

33.515.280 The zoning code provides a process to modify environmental zone boundaries. In the Columbia South Shore, the process to reduce or remove "p" zone areas involves a zoning map amendment. The new language alerts the applicant and the Planning Bureau staff that archaeological resource measures of this plan district (33.515.262) shall apply even after the "p" zone is pulled back or removed.

Environmental Zones

33.515.265 Purpose

The purpose of the environmental regulations in the Columbia South Shore Plan District south of NE Marine Drive is to:

- Protect inventoried significant natural resources and their functional values in the Columbia South Shore Plan District, as identified in the Comprehensive Plan;
- Implement the Comprehensive Plan environmental policies and objectives;
- Encourage coordination between City, county, regional, state, and federal agencies concerned with natural resources; and
- Protect inventoried significant archaeological resources where those resources overlap with a "p" or "c" zone.

33.515.268 - 33.515.278 [No change]

33.515.280 Columbia South Shore Environmental Review

A.Purpose of the review. Environmental review of uses and development in the Environmental zones is intended to provide adequate protection for the identified natural resources. The review provides for flexibility and reasonable development opportunities when development is sensitive to the special environmental concerns of the site. Within the plan district, the applicant should be aware that if an archaeological resource exists on an area to be removed from environmental zones, protection measures of 33.515.262 still apply.

B.Modifying Environmental Zone boundaries. Environmental zone boundaries may be modified by the City as the result of and concurrent with approving development in a natural resource area. The boundaries may be modified for either of the two situations stated below. All other requests for boundary changes are processed as a change of an overlay zone, as stated in Chapter 33.855, Zoning Map Amendments.

1.Creation of new resource areas. The Environmental Protection zone will be expanded as part of the environmental review to include areas identified for mitigation.

2.Loss of existing resource areas. The environmental zone may be removed from an existing natural resource zoned EC where approved development will eliminate the natural resource. The zoning designation will not be removed until after all required mitigation measures have been completed.

2b) Adopt new Maps 515-6 and 515-7 for the Columbia South Shore Plan District

As a result of City Council adoption of the *Archaeological Resources Protection Plan for Columbia South Shore*, the following two maps appear at the end of the Columbia South Shore plan district. Map 515-6 shows areas within the plan

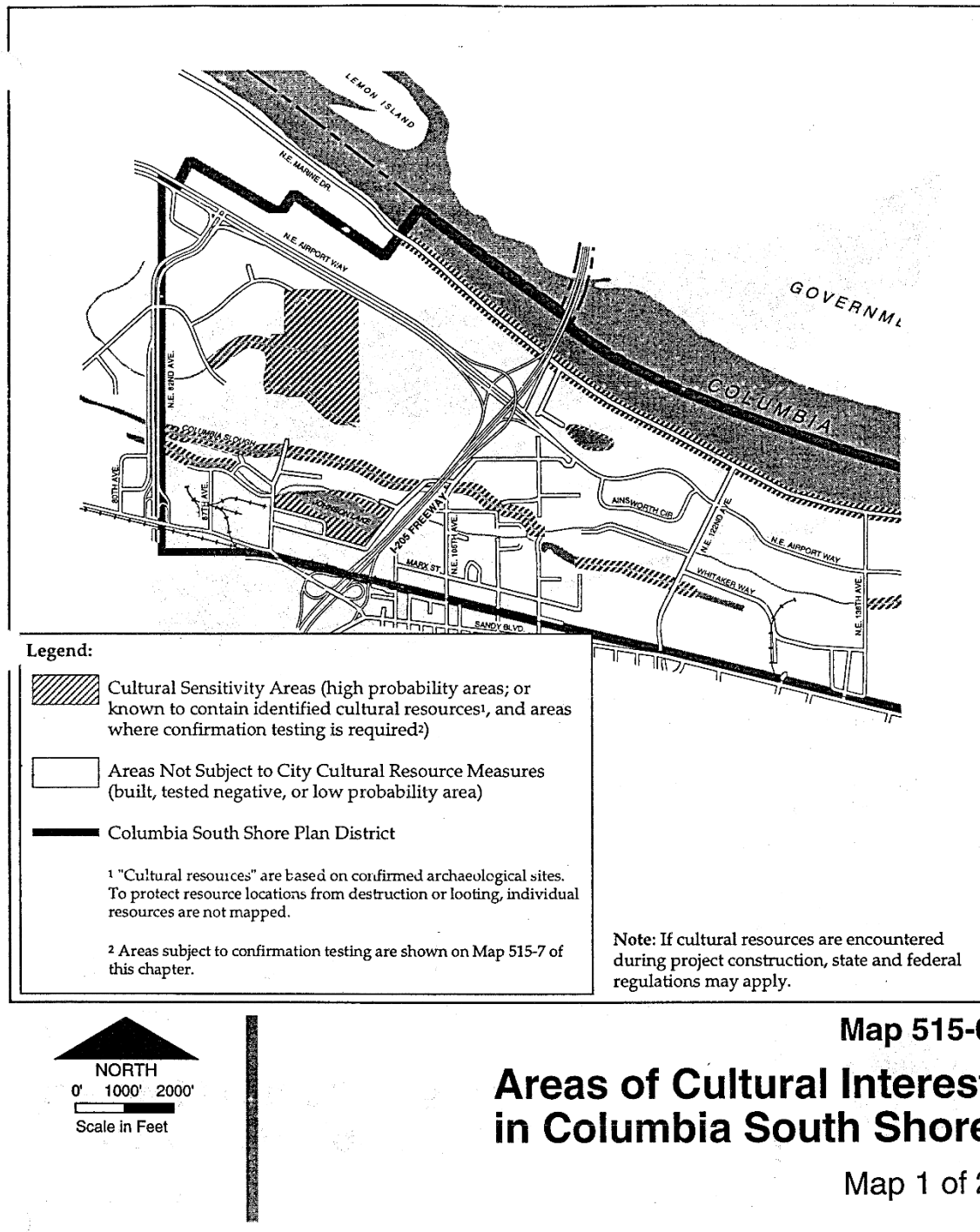
district of relatively high probability of encountering an archaeological resource (Indian use site) during project construction. Properties in the archaeological sensitivity areas either contain an identified archaeological resource, areas needing further confirmation testing, or are located so close to an identified archaeological resource on nearby property that removal of the property from the archaeological sensitivity areas would jeopardize resource locations. For more details of archaeological sensitivity areas, see Chapter 8 of this report.

Map 515-7 identifies areas that need further archaeological testing to assess the presence of archaeological resources. For each area, the number of subsurface auger probes is shown in a black circle. The Bureau of Planning will keep track of confirmation testing, and remove the map designations upon completion of recommended confirmation testing requirements in the plan district (PCC 33.515.262.D.6).

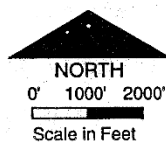
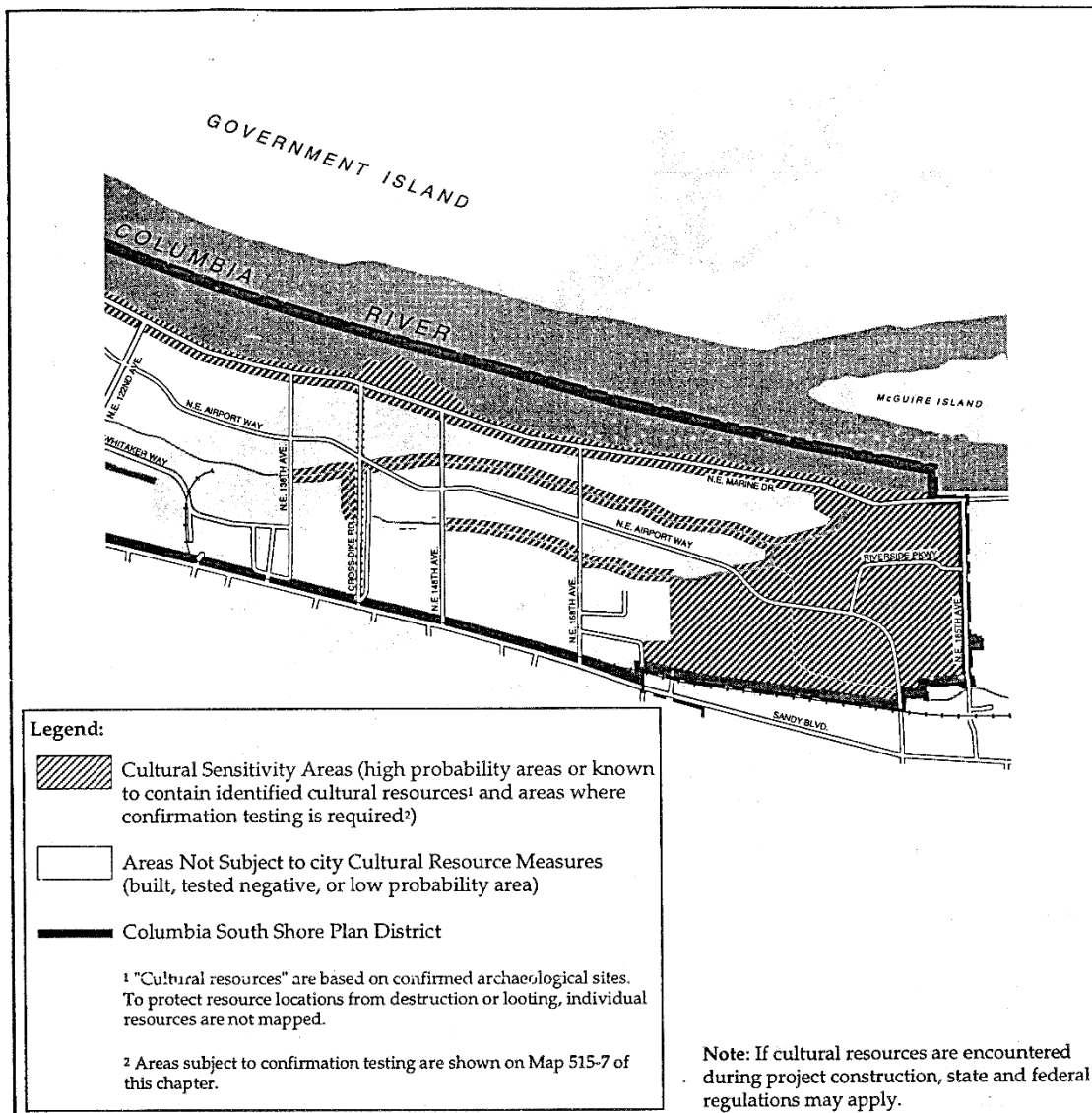
On June 5, 1996, City Council amended Map 515-7 to recognize the completion of confirmation testing which was in progress on two properties. Sample testing on those properties occurred during the later stages of public review of this plan. Map 515-7 reflects this amendment.

Between June 1996 and December 2003, confirmation testing was completed on six properties. Map 515-7 (page 1 of 2) does not change; only the second page changes, show on the next page.

Map 515-6 (page 1 of 2)



Map 515-6 (page 2 of 2)



Map 515-6
Areas of Cultural Interest
in Columbia South Shore

Map 2 of 2

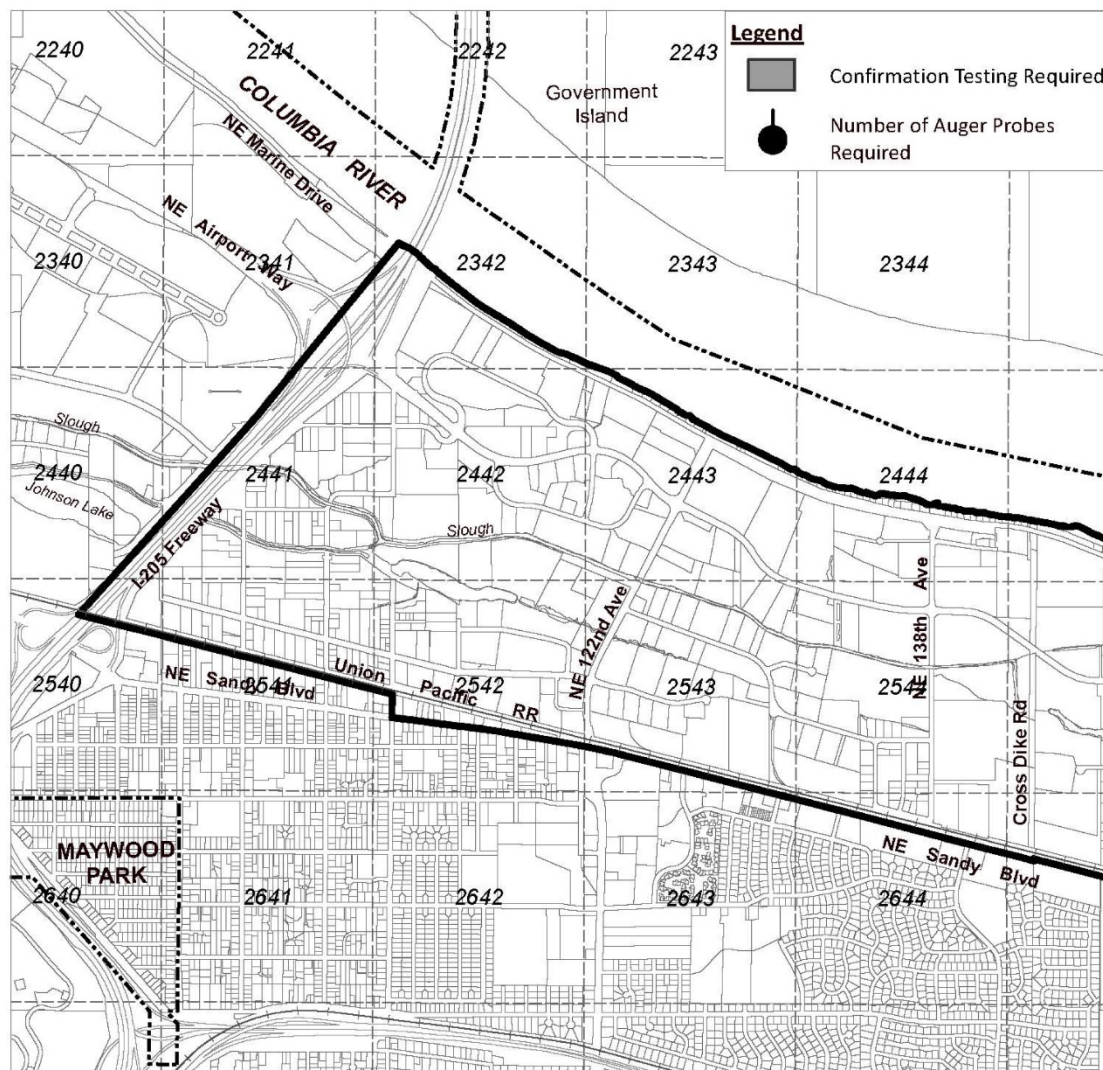
Map 515-7 (page 1 of 2)

Columbia South Shore Areas Where Confirmation Testing is Required

Map 515-7

Map 1 of 2

Map Revised January 1, 2015



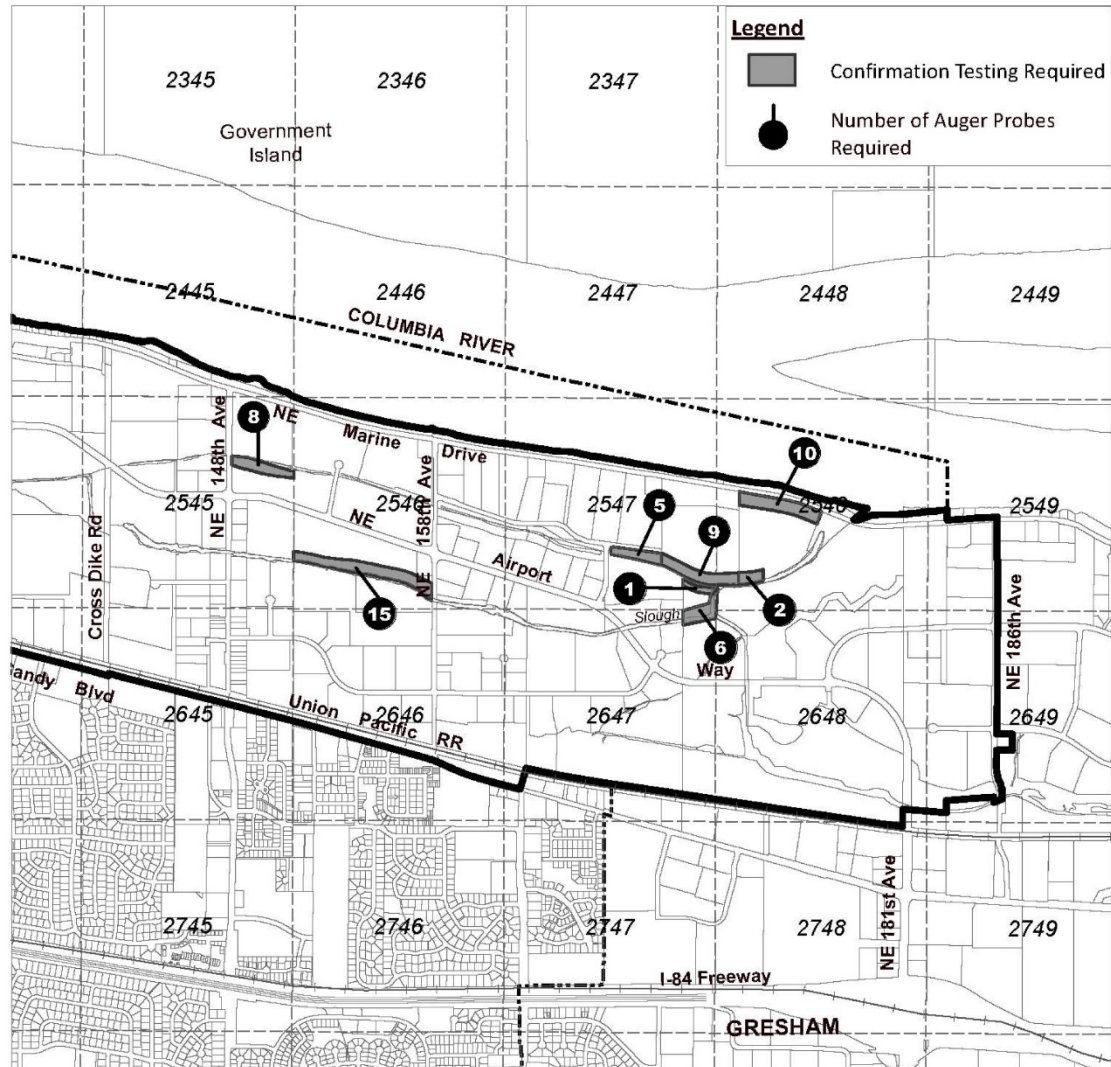
Map 515-7 (page 2 of 2)

Columbia South Shore Areas Where Confirmation Testing is Required

Map 515-7

Map 2 of 2

Map Revised January 1, 2015



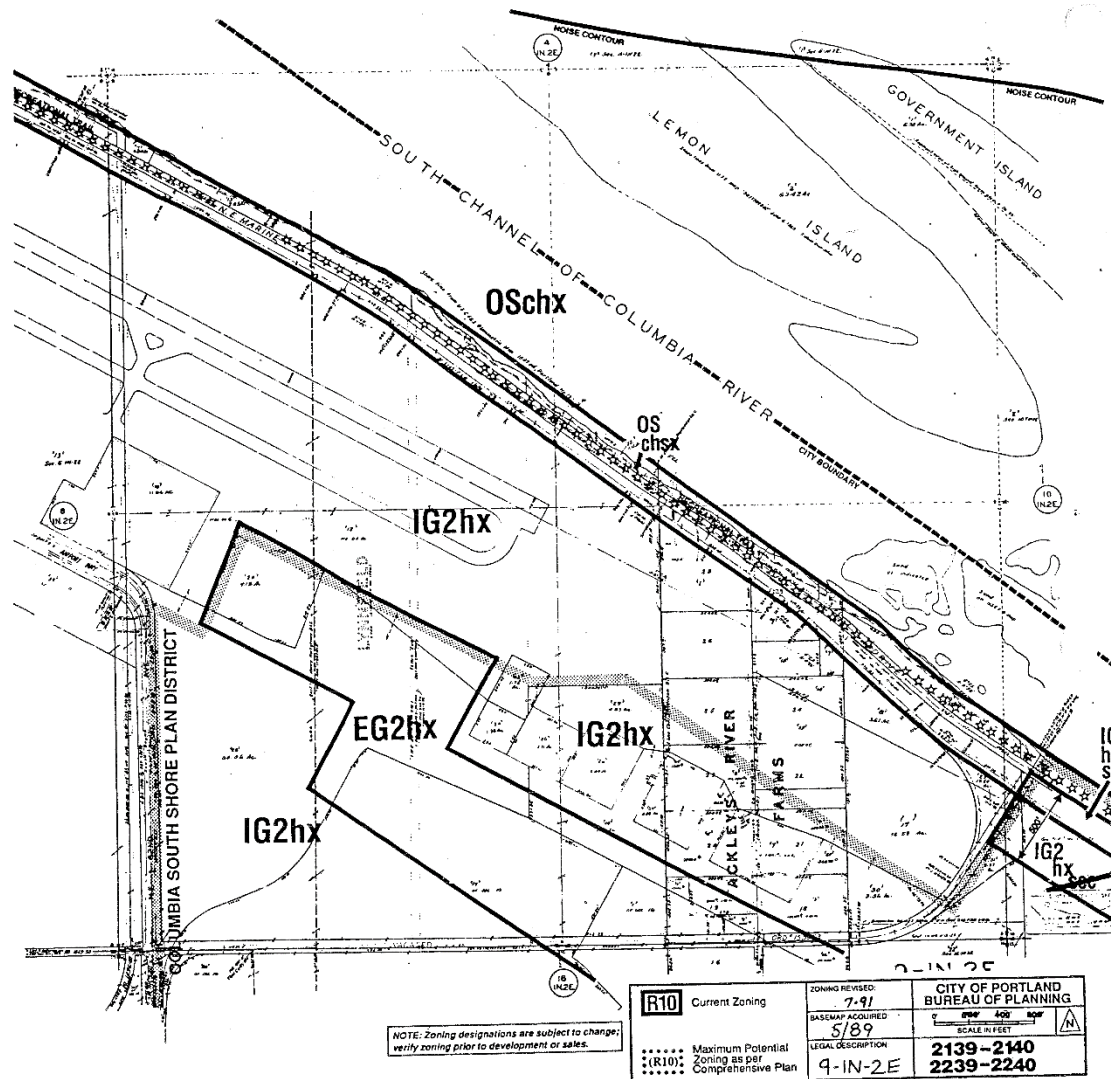
----- City Boundary
 Plan District Boundary

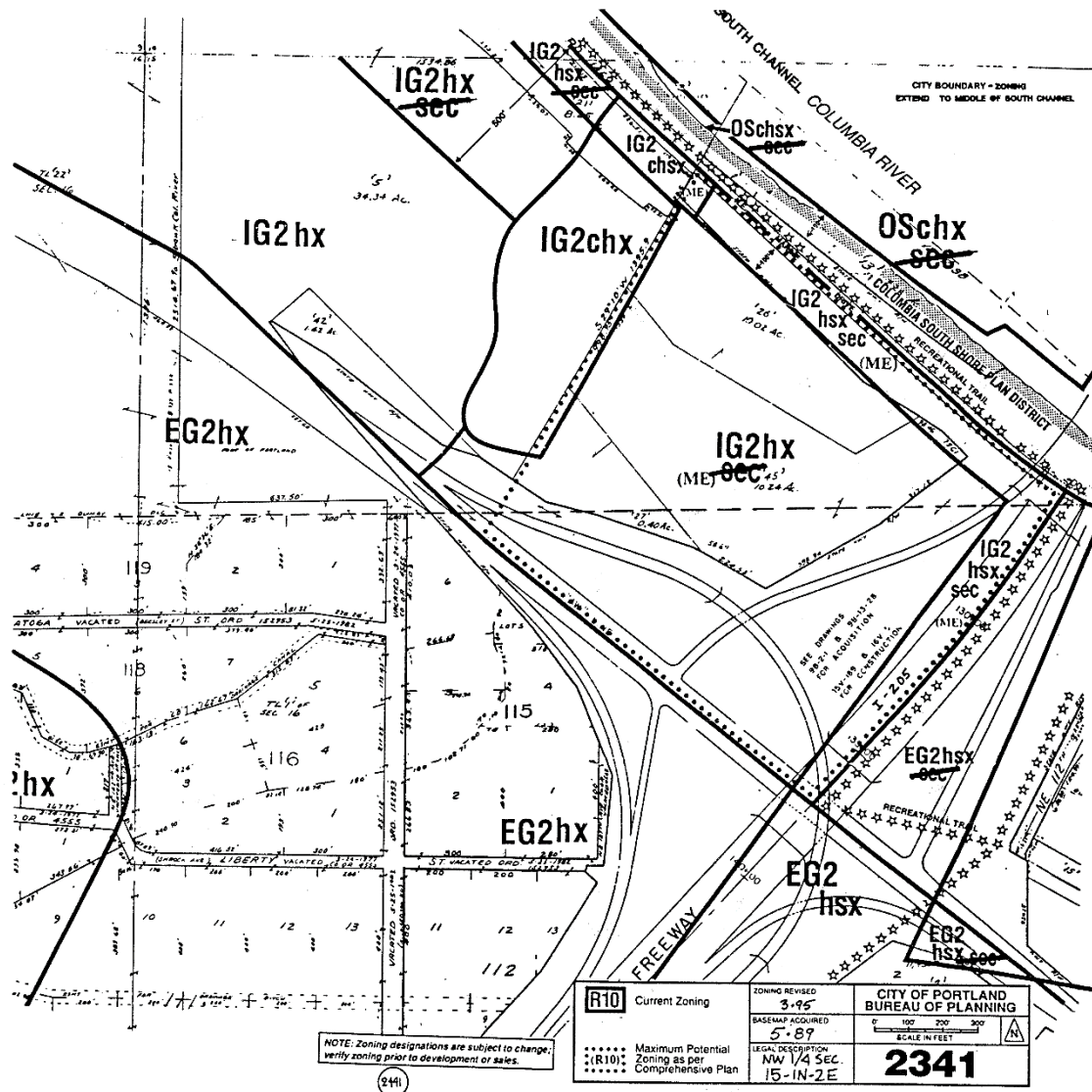
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 Bureau of Planning and Sustainability
 Portland, Oregon

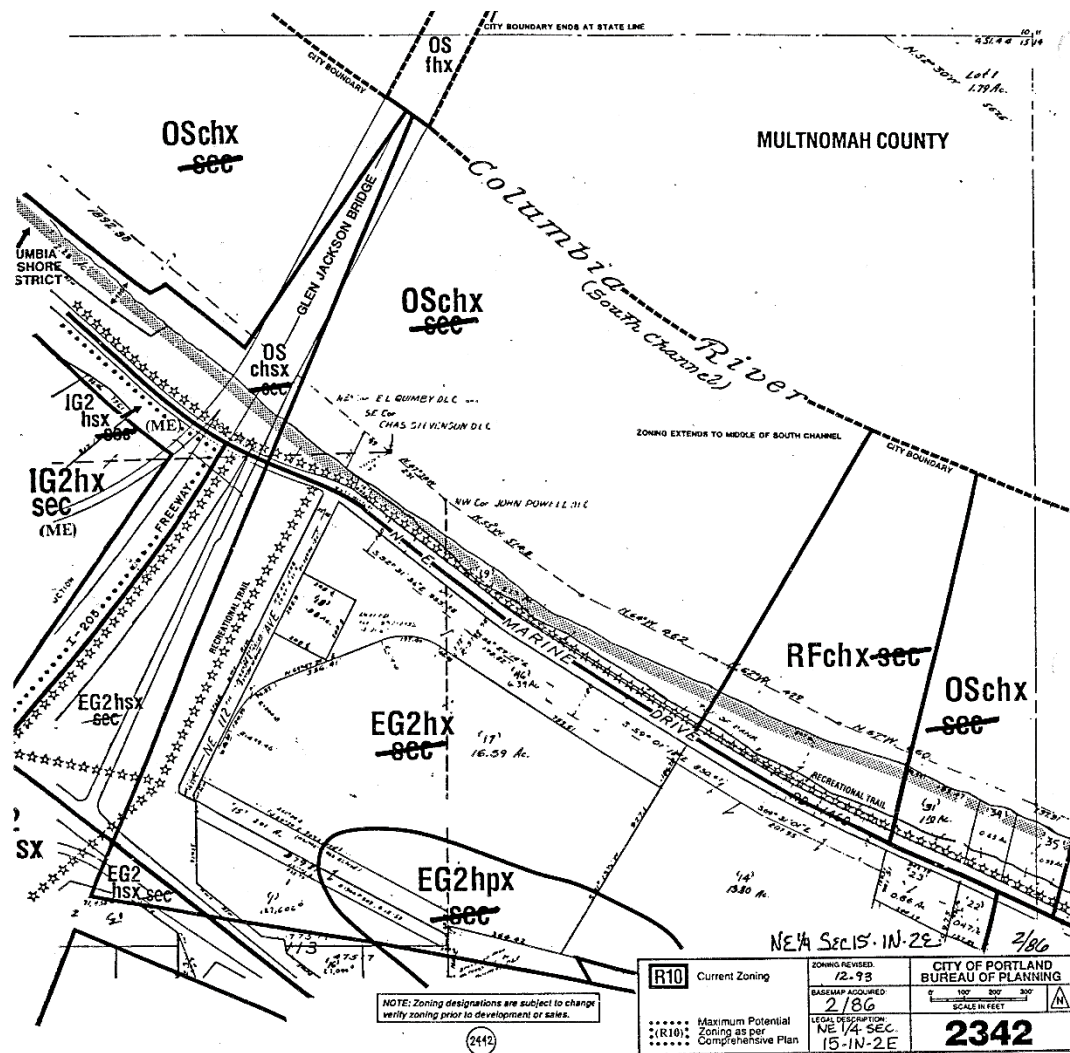
3) AMENDMENTS TO OFFICIAL ZONING MAPS

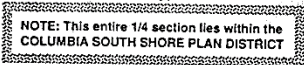
Delete the sec zone from appropriate zoning maps.

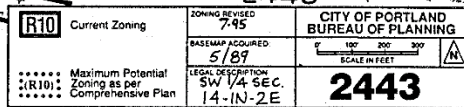
In the Columbia South Shore, there are fifteen quarter section maps with the interim cultural resource protection zone (shown as "sec"). The recommended plan removes the sec zone from these zoning maps. With the adoption of the cultural plan, the sec zone is no longer needed as an interim protection measure.

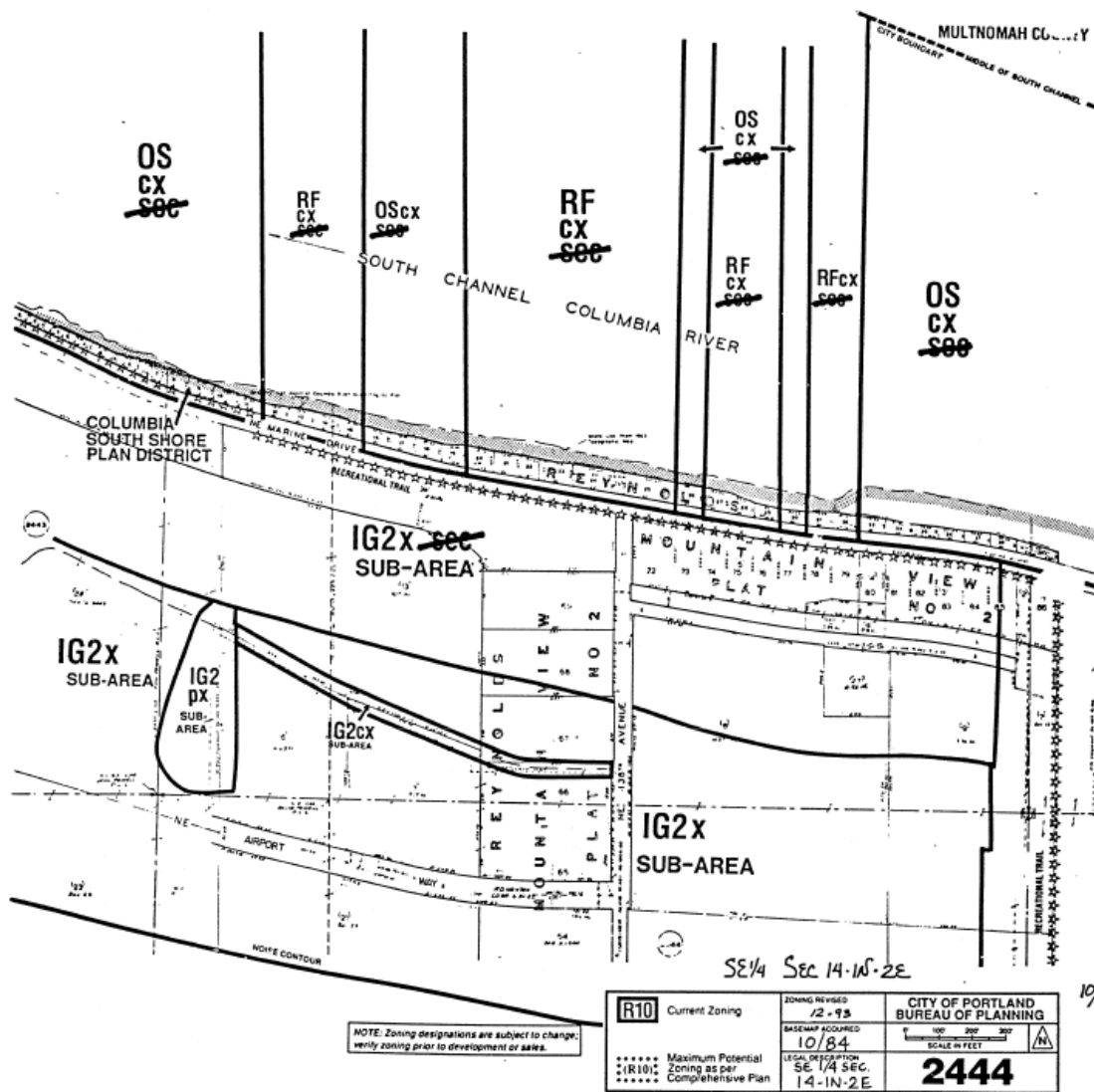


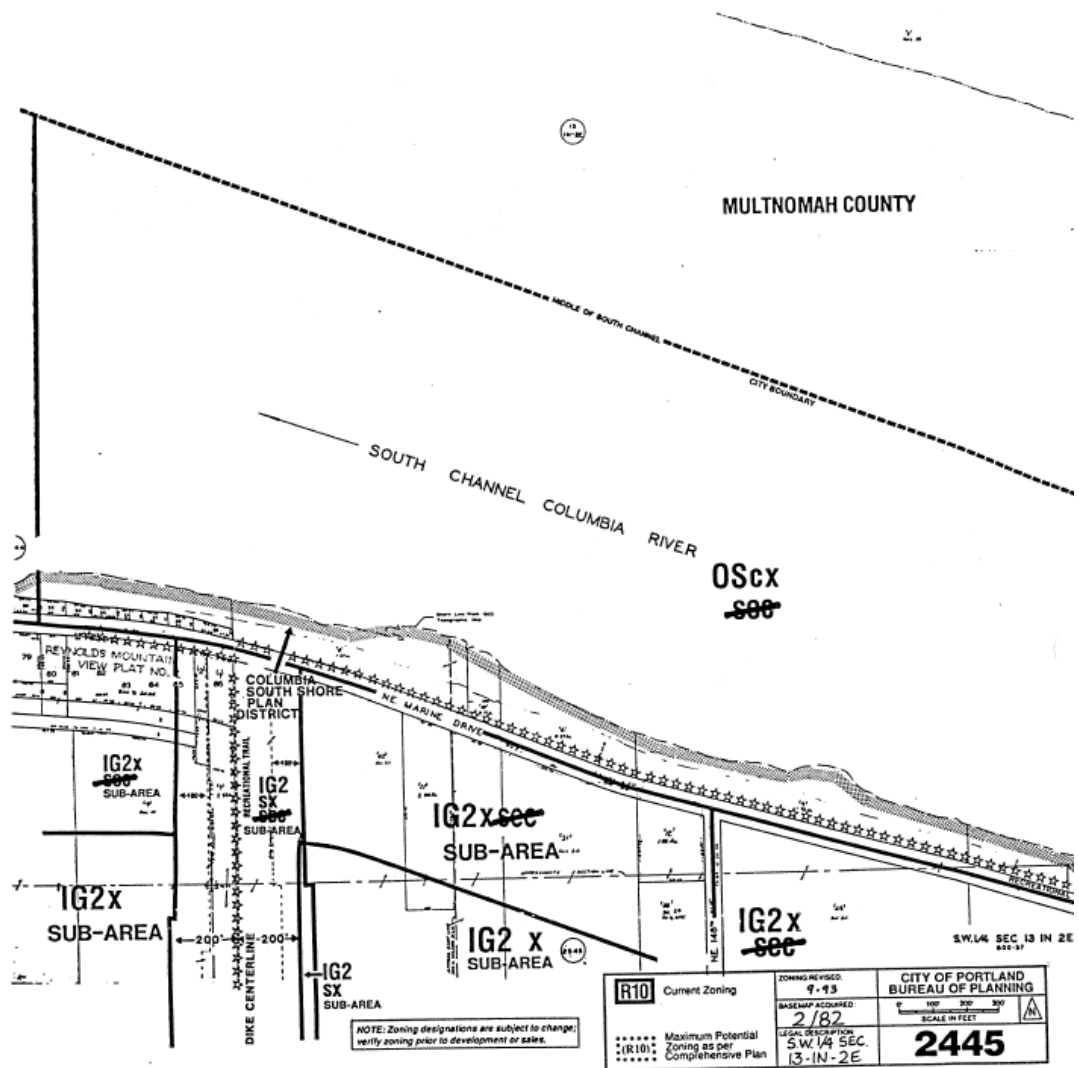


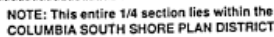












NOTE: Zoning designations are subject to change
verify zoning prior to development or sales.

<div>R10</div> Current Zoning	ZONING REVISION 7-93	CITY OF PORTLAND BUREAU OF PLANNING
	BASEMAP ACQUIRED 5-89	
***** Maximum Potential (R10): Zoning as per Comprehensive Plan	LEGAL DESCRIPTION N.E. 1/4 SEC. 23 - 1N - 2E	2544

