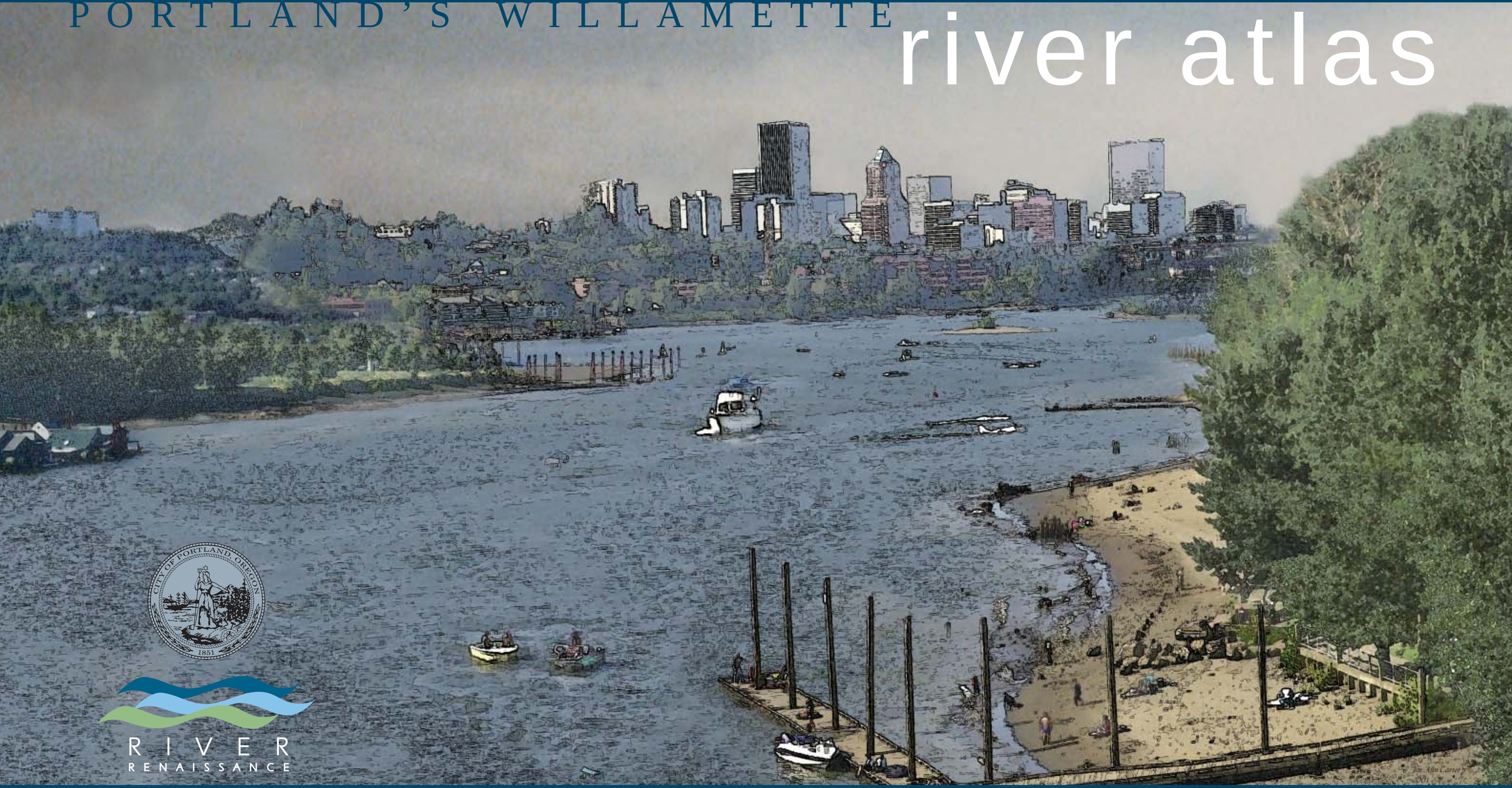
PORTLAND'S WILLAMETTE

river atlas



CITY OF PORTLAND, OREGON 1851

RIVER RENAISSANCE

AUGUST 2001

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TABLE OF CONTENTS

INTRODUCTION

The Willamette River and the city of Portland are inherently linked. The river is literally and figuratively the center of the city. It has been instrumental in shaping our economy, culture, and quality of life. Now, on its one hundred and fiftieth birthday, Portland looks to its past, and its reliance on the river, to guide its future.

Over the last 150 years, Portland's harbor and central city have flourished in and along the Willamette River. In 2001, Portland is home to a quarter of the region's two million people. The Portland Harbor is the seventh largest export gateway, the largest wheat exporter, and the sixth largest auto port in the nation. Eleven distinctive bridges cross the Willamette in Portland and twelve riverfront parks line its banks. In 1998, the national significance of the Willamette River was acknowledged through its designation as one of 14 American Heritage Rivers.

Despite these achievements, the Willamette River is facing many challenges. Growth and development have dramatically altered the river channel and its banks. Ironically, urbanization along the river has slowly reduced public access to its shores. Only a few places remain where people can connect with the river and, as a result, the community has become detached from Portland's defining natural feature.

The Willamette has been filled, dredged, redirected, and channeled. Its wetlands have been drained and filled. Combined sewer overflows, non-point source pollution, and pollutants from various industries have compromised water quality. In 1998 and 1999, steelhead trout and chinook salmon in the lower Willamette River and its tributaries were listed as threatened species under the federal Endangered Species Act (ESA). Cutthroat trout in the lower Willamette River are a candidate species for an ESA listing. In December 2000, the U.S. Environmental Protection Agency designated a six-mile stretch of Portland Harbor as a Superfund site—an area of national priority for the cleanup of contaminants. One of Portland's greatest challenges in the decades to come will be the restoration of the Willamette River's health for the benefit of fish, wildlife, and people.

Today, a new movement is emerging. River Renaissance is the City of Portland's comprehensive, multi-objective initiative to respond to the challenges of this new century. The River Renaissance Vision calls for a clean and healthy river, a prosperous working harbor, vibrant new waterfront districts and neighborhoods, enhanced access to the river, new recreational opportunities, partnerships for implementation, and community education. As part of River Renaissance, the Bureau of Planning is coordinating a citywide effort to create an integrated plan for the land along the Willamette River, develop partnerships between the public and private sectors to implement the plan, and expand awareness of and commitment to the river's future. Portland's Willamette River Atlas is a tool that will help us as we plan together for a vibrant city centered on a healthy Willamette River.

RIVER

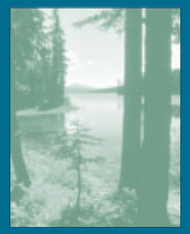
THE WILLAMETTE RIVER WATERSHED

The Willamette River Watershed

lies between the Columbia River on the north, the Calapooia Mountains on the south, the Cascade Mountain Range on the east and the Coast Mountain Range on the west. Over 11,500 square miles of land in the Willamette watershed drain into the Willamette River, making it the tenth largest river by volume in the continental United States. The Willamette River mainstem begins at the confluence of the Coast Fork Willamette and Middle Fork Willamette Rivers near Eugene. It flows north for 187 miles, drops 350 feet in elevation and empties into the Columbia River in North Portland. Several tributary rivers flow into the Willamette mainstem, including the Tualatin River and Clackamas River which are within the Portland metropolitan area. The location of the Willamette River in the lower Columbia River basin defines its role as a seaport and a spawning ground for seagoing fish, including salmon and steelhead trout.

Approximately 70 percent of the land in the fertile Willamette River watershed is forested. Twenty-two percent of the land is devoted to agriculture and eight percent is devoted to urban development. Forested land dominates the foothills and mountains of the Coast and Cascade Ranges. Most of the agricultural land is located in the Willamette Valley and is used to cultivate annual crops. Approximately 70 percent of the state's population of 3,400,000 people reside in the valley, primarily along the mainstem.

FIGURE 1:
Willamette River Watershed



Waldo Lake — source of the Middle Fork of the Willamette in the Cascades

The Willamette River

flows through Portland for 17 miles. Flow rates throughout the city range from 5,000 cubic feet per second during the summer to approximately 80,000 cubic feet per second during high flow periods in the winter and spring. Peak flows after heavy rains can swell from 200,000 to 400,000 cubic feet per second.

Figure 2, on page 2, a survey map of the Willamette River from the 1880s, shows the natural riverbanks and the numerous lakes that once surrounded the river. Comparison of the survey map with the current map in Figure 2 reveals the extent to which the course of the Willamette River and the shape of its riverbanks have been altered over the past century. Most notably, the river once flowed to the east of Swan Island. Figure 2 also shows the decreasing number of natural areas surrounding the river due to encroaching urban development.

A brief glimpse into Portland's history offers an explanation for the changing landscape of the Willamette River. It is believed that for thousands of years, Native Americans lived in harmony with the Willamette River, valuing its precious resources. In the mid-1800s, the first Western Europeans settled in Portland because the site offered deep-water moorage for sailing ships journeying up the Columbia River. Thereafter, multilayer wooden wharves and docks lined the riverbanks, allowing Portland to flourish economically.

Early Portland waterfront

The seawall under construction, 1929

Harbor Drive under construction in the 1940s

Tom McCall Waterfront Park, 2001

ATLAS

In 1929, the central city wharves were replaced with the seawall for flood protection. Agricultural exports from the fertile Willamette Valley farmlands and a boom in the shipbuilding industry during World Wars I and II defined the Willamette's role as a working river. Manipulation of the river and its banks continued as Guilds Lake and Swan Island were filled with river sediment to later become industrial districts. For a short time Swan Island was used as the city's airport. Ramsey Lake was also filled and is now the Rivergate Industrial District. Industry dominated the land use along the Willamette's riverbanks throughout the 1950s and 1960s. It has since concentrated in the northern stretch of the river, which is now known as "Portland Harbor".

Portland formed a new relationship with the Willamette River in the 1970s. A thriving and growing urban core and a desire to reclaim the riverbanks led to the replacement of Harbor Freeway with Tom McCall Waterfront Park. During the same period, *Statewide Goal 15* was adopted to protect, conserve, enhance, and maintain the natural, scenic, historical, agricultural, economic, and recreational qualities of lands along the Willamette River as the Willamette River Greenway.

Today, within the Willamette's urban setting in Portland, the river is heavily used for a variety of activities. The southern portion is largely used for fishing and recreation. In the north, river-dependent shipping and industry are the predominant activities. The intensely urban stretch of the river in the center of Portland is a focal point for the city.

As Portland's defining natural feature and a hub for numerous activities, the Willamette River inspires us to become a city in nature where a healthy economy and a healthy river can coexist.

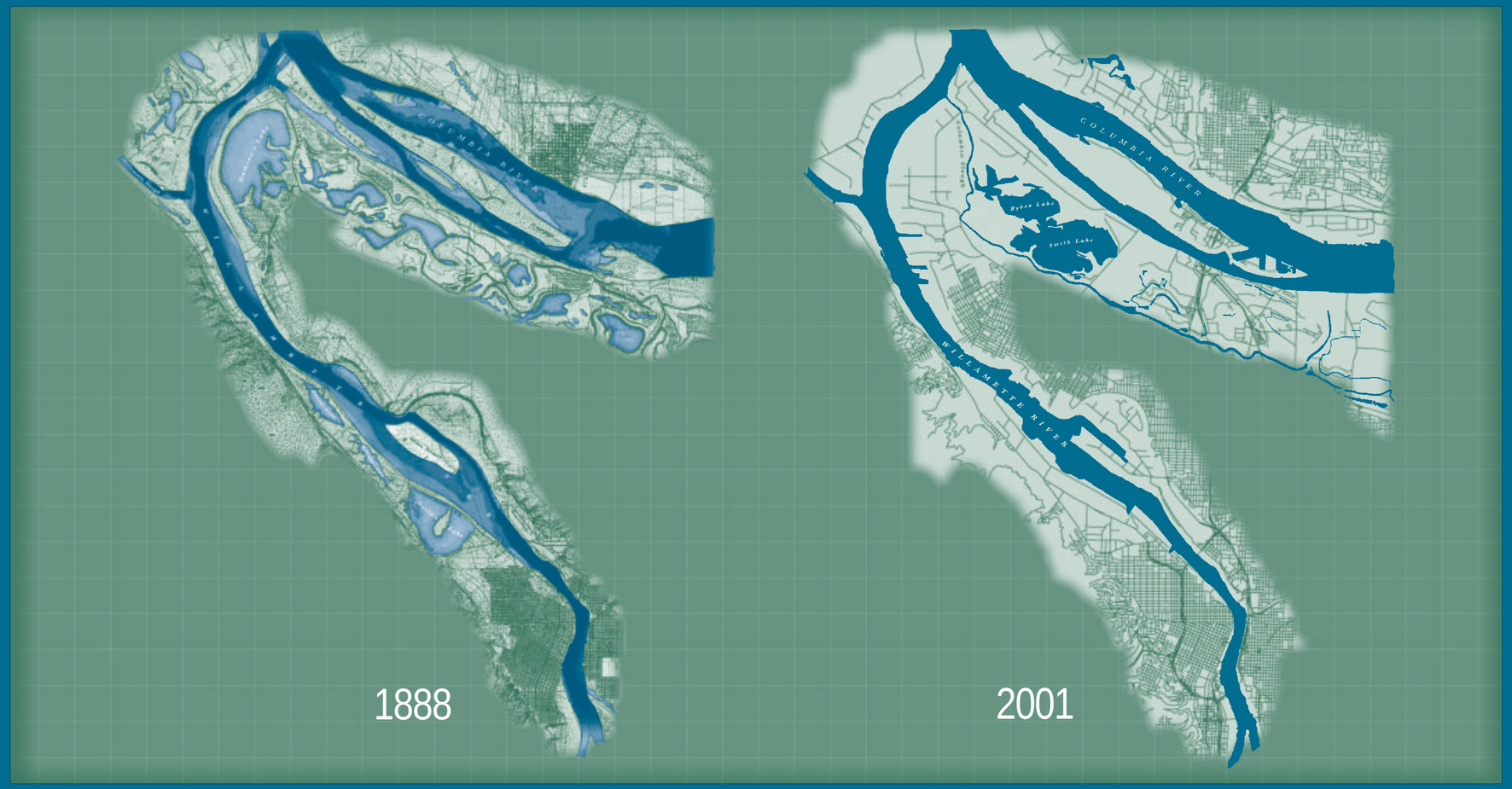


FIGURE 2:
Confluence of the Willamette and Columbia Rivers

Over the last century, urban development has dramatically altered the Willamette River and adjacent land. The shades of blue on the enhanced 1888 survey map, on the left, illustrate the lakes and wetlands that once surrounded the river. Today, many of these natural areas have been filled for industrial use as illustrated in the map on the right.

RIVER

MAP DESCRIPTIONS

Overview

The maps in this Atlas feature geographic information of the Willamette River corridor in Portland. They present an overview of environmental, regulatory, recreational, land use, and ownership information. Each map is represented at a scale of 1:2000 feet. The maps show taxlots (Multnomah County Assessment and Taxation, last updated in July 2000); freeways (Bureau of Planning, from City of Portland photogrametrics, 1989–1994); railroads, and generalized outlines of the Willamette River, Columbia Slough, and Smith and Bybee Lakes (Metro Regional Land Information System, 1994). The City of Portland, Bureau of Planning's Geographic Information System (GIS) generated the existing information portrayed in these maps.

Layout

Descriptions for the eight maps occur on pages 3–10. The maps are grouped at the end of the Atlas on pages 11–26 so that they may be easily compared.

MAP 1

Aerial Photo

Map 1, on pages 11 and 12, is a composite digital aerial photograph (1998) that features the Willamette River corridor. The aerial photograph provides a view of urban development, natural features, water bodies, and areas of remaining vegetative cover.

The geometric street patterns of downtown Portland and the inner eastside neighborhoods are visible on Map 1. The aerial photo shows the river's edge lined by urban development and transportation systems, with only a few fragments of natural areas still intact. Most of the riverfront and bottomland in North and Northwest Portland are developed as industrial districts. Southwest of the river corridor, the less developed areas reflect the rugged topography of the Tualatin Mountains and public ownership of Forest Park. Additional undeveloped areas along the southern portion of the river include parts of Hardtack Island and Ross Island, Oaks Bottom Wildlife Refuge, and Ira Powers Marine Park. The city limits, and various road and place names, are provided to help orient the reader.

MAP 2

Natural Resources

Map 2, on pages 13 and 14, highlights natural resources along the Willamette River corridor in the city of Portland. The map depicts the 100-year flood plain, 1996 flood inundation areas, bathymetry, streams, habitat sites, and steep slopes.

100-Year Flood Plain

The 100-year flood plain was derived from the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps used for the National Flood Insurance Program. Land located within areas designated as a 100-year flood plain has a one-percent chance or greater of being flooded within any given year.

1996 Flood Inundation

Map 2 shows the areas in Portland affected by a major flood in February 1996. The areas inundated include portions of most riverfront parks, areas east of SW Bond Avenue, and various riverfront industrial, commercial, and residential sites. The 1996 flood inundation area maps were digitized by the U.S. Army Corps of Engineers using aerial photos taken during the flood.

Bathymetry

River depth, or bathymetry, was derived from two sources. Main channel bathymetry is from the City of Portland, Bureau of Environmental Services' database and was developed using U.S. Army Corps of Engineers survey information. Bathymetry for the Swan Island Lagoon, Holgate Slough, Multnomah Channel, and the Columbia River was developed from U.S. Department of Commerce, National Oceanographic and Atmospheric Administration (NOAA) sounding and bridge clearance maps.

Streams

Stream data is derived from Metro Regional Land Information System (RLIS) Title 3 stream coverage (August 1999). The streams on the west side of the Willamette River flow through steep ravines on their way to the river. Most of these streams also pass through pipes or culverts before entering the Willamette River. On the east side, urban development has buried most of the streams once known to exist. One exception is Johnson Creek and its tributary Crystal Springs, located in Southeast Portland.

Habitat Sites

The habitat sites shown on this map were derived from a Willamette River habitat assessment conducted in 1999-2000. A survey of each of these areas was conducted to observe and record habitat quality. Detailed maps and descriptions of the areas are in the *Willamette River Greenway Inventory: Natural Resources* (2001).

Steep Slopes

Metro RLIS information, derived from U.S. Geological Survey 7.5 minute quadrangle maps (1993), was used to map topography and determine the location of steep slopes. The steep slopes depicted on this map are those that exceed 25 percent.

Many of the steep slopes occur in the Tualatin Hills, a small mountain range rising above Portland's west side and running roughly parallel to the river. Along the east side of the Willamette River, alluvial processes have formed several steep bluffs. As a result, excellent river viewing areas exist from Terwilliger Boulevard overlooking North Macadam, Sellwood Boulevard overlooking Oaks Bottom Wildlife Refuge, Willamette Boulevard overlooking Albina Yard and Mocks Bottom, and the University of Portland overlooking the Swan Island Lagoon.

Mouth of the Columbia Slough as it enters the Willamette River

The Tualatin Hills frame Portland's west side

Swan Island Lagoon from the University of Portland overlook

Willamette

MAP 3

Willamette Riverbanks

Map 3, on page 15 and 16, shows the Willamette riverbank composition, contaminated sites, and the location of documented stormwater outfalls.

Riverbank Composition

The riverbank composition data were produced for the City of Portland based on field surveys conducted in 1999. The Bureau of Planning updated the information in 2001. The riverbank composition is classified into seven generalized categories described in Table 1.

Outfalls

Outfalls are discharge pipes that release storm-water, stream water, wastewater, or a combination of the three into larger water bodies such as rivers and lakes. Map 3 shows the location of documented outfalls along the Willamette River. The outfall information was obtained from a City of Portland, Bureau of Environmental Services' May 2000 inventory and from a survey of unrecorded outfalls conducted for the Bureau of Planning in March and November, 1999.

Portland Harbor Investigation and Clean-up Sites

The sites identified on Map 3 are undergoing cleanup or investigation for environmental contamination in the Portland Harbor. This information was provided by the Oregon Department of Environmental Quality. These sites are located within a six-mile stretch of the river between Sauvie Island and Swan Island. Sediments found in this area of the Portland Harbor contain detectable levels of contaminants, including PCBs, pesticides, herbicides, metals, dioxins, arsenic, chromium, and petroleum-related hydrocarbons.

TABLE 1:
Willamette Riverbank Composition

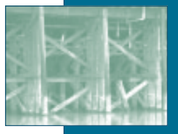
Natural
Relatively undisturbed banks composed of rock outcrops or native earth material. Vegetative cover varies; both living and dead vegetation may be present.

Rip Rap
Banks armored with rocks of various sizes; generally devoid of vegetation but may be covered with trees and shrubs.

River Beach
Shallow shoreline, usually with a grade of 20 percent or flatter, that consists of sand, silt, fine gravel, or other sedimentary deposits. In some locations, the beach may be visible below other bank conditions only at low water. In other locations, the beach may extend gradually up to the adjacent flood plain.

Sea Wall
Constructed, impervious vertical walls, generally composed of concrete, timber, or sheet pile that extend below ordinary low water.

Bio-technical and Bio-engineered Banks
Banks that rely on vegetation and other materials for bank stability. Bio-technically engineered banks incorporate vegetation as a visible component of the bank, but inert and man-made materials provide the physical structure that ensures bank stability. Bio-engineered banks rely on vegetation and natural fabric materials for bank stability.

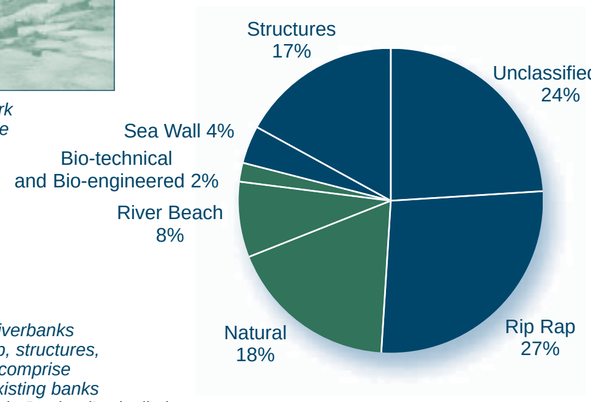


Structures
Banks covered by piers, wharves, supporting docks, buildings, and other structures.

Unclassified Fill
Areas along banks that have been filled over time with miscellaneous unconsolidated materials consisting of debris of various types.

The riverbank at Cathedral Park in North Portland is an example of river beach.

FIGURE 3:
Existing Willamette Riverbank Composition



As illustrated in Figure 3, the riverbanks are mostly non-natural. Rip rap, structures, unclassified fill, and sea walls comprise approximately 72 percent of existing banks along the Willamette River within Portland's city limits. Twenty-six percent consist of natural and river beach banks. Bio-technical and bio-engineered banks constitute only two percent of existing bank types, but that percentage is expected to grow over time as riverfront redevelopment and restoration occurs. Riverbank composition data was provided by GreenWorks, PC Landscape Architecture, Portland. Some information was updated by the Bureau of Planning in 2001.

MAP 4

Recreation, Scenic, and Trail Resources

Map 4, on page 17 and 18, provides an overview of the recreation and trail resources located in the vicinity of the Willamette River in Portland. The map features bikeways, Willamette Greenway Trail segments, conceptual trails, parks, public boat docks, boat launches, viewpoints, greenway view corridors, and scenic view vantage points.

Willamette Greenway Trail

The Willamette Greenway Trail displayed on this map represents the alignment proposed in the City of Portland's *Willamette Greenway Plan* (1987) and the various stages of trail completion to date. The trail information was obtained from the *Willamette Greenway Trail Inventory* (1999) conducted by the Bureau of Parks and Recreation. The Bureau of Planning updated the information in 2001. The greenway trail is planned as a 41-mile pedestrian and bicycle trail, extending along both sides of the river as a combination of on-street and off-street paths.

Conceptual North Portland Trails

Map 4 also shows various conceptual trails in North Portland which are discussed in the *Draft North Portland Willamette Greenway Trail Feasibility Study* (2000). The draft study, conducted by the Bureau of Parks and Recreation, analyzes the feasibility of implementing these trails in the future. The trails extend along a stretch of mostly waterfront properties in the Central Eastside, Swan Island and North Portland Areas.

Bikeway Network

The Portland bikeway network displayed on Map 4 includes both existing and recommended/ proposed bikeways. Portions of the network that overlap with the Willamette Greenway Trail are not shown.

TABLE 2:
Willamette River Greenway Trail

Off-Street Trail
Existing greenway trail segments separated from vehicular traffic.

On-Street Paths
Existing greenway trail segments on streets or sidewalks.

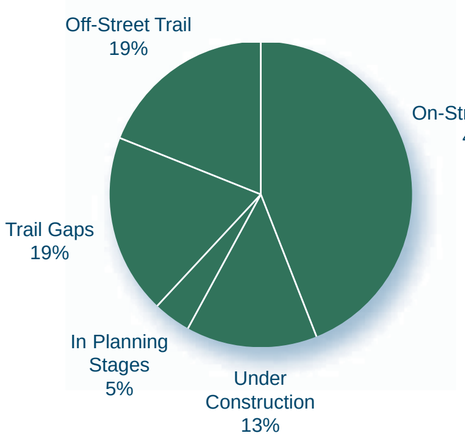
Trail Gaps
Undeveloped segments of the greenway trail along designated alignment.

Interim Routes
Short-term routes to connect existing greenway trail segments near the alignment of currently undeveloped trail segments.

In Planning Stages
Undeveloped greenway trail segments being planned.

Under Construction 2001
Greenway trail segments under construction beginning in 2001.

FIGURE 4:
Existing Willamette River Greenway Trail



As of July 2001, approximately 26 miles (63 percent) of the 41-mile greenway trail network had been implemented in accordance with the Willamette Greenway Plan (1987). *Seven miles (18 percent) are either under construction or in the planning stages. The remaining trail gaps represent approximately eight miles (19 percent) of the total network.*

Parks and Open Spaces

The parks and open space information displayed on Map 4 was assembled from Metro's parks and open space GIS coverages, and the *Draft Willamette River Greenway Inventory: Recreational Resources and Visual Character* (2000) conducted for the Bureau of Planning. Twelve parks currently provide public access to the Willamette River in Portland. From north to south, these parks include Kelley Point Park, Cathedral Park, McCarthy Park, Eastbank Esplanade, Tom McCall Waterfront Park, South Waterfront Park, Cottonwood Bay, Willamette Park, Oaks Bottom, Butterfly Park, Sellwood Riverfront Park, and Ira Powers Marine Park. The map shows the eastside neighborhoods dotted with numerous community-oriented parks and a regional park in the Smith and Bybee Lakes area. Beyond the river's edge on the west side, there are large regional parks including Forest Park, Washington Park, and Tryon Creek State Park.

South Waterfront Park

Eastbank Esplanade

Sellwood Riverfront Park

Willamette

ATLAS

Public Boat Launches

Boat launches identified in Map 4 indicate areas where facilities exist for the public to launch boats or other watercraft into the Willamette River in Portland. *The Draft Willamette River Greenway Inventory: Recreational Resource and Visual Character* (2000) identifies six publicly-owned boat launch sites. They are located at Cathedral Park, Swan Island Lagoon, McCarthy Park, South Waterfront Park, Willamette Park, and on the Columbia Slough. With the exception of South Waterfront Park, McCarthy Park, and the Columbia Slough, these sites provide ramps for motorized boats. Only non-motorized boats (such as canoes and kayaks) may be launched at South Waterfront Park, McCarthy Park, and the Columbia Slough. Other privately owned boat launches in Portland, which do not appear on Map 4, provide additional places for the public to launch boats and other watercraft.

Public Boat Docks

Boat docks on Map 4 indicate areas where City-owned facilities exist for the public to dock boats or other watercraft along the Willamette River. The *Draft Willamette River Greenway Inventory: Recreational Resources and Visual Character* (2000) identifies eight boat docks owned by the City of Portland. They are located at Cathedral Park, Waterfront Park (one at SW Ankeny Street and one at SW Salmon Street), the Eastbank Esplanade, SE Madison Street, Willamette Park, Sellwood Riverfront Park and Butterfly Park. The dock at SW Salmon Street, owned by the City of Portland's Bureau of Parks and Recreation, is leased to the Portland Spirit and does not allow for public docking. Other privately owned docks in Portland, which do not appear on Map 4, provide additional places for the public to dock.

Boat launch at Willamette Park

Public boat dock at Sellwood Riverfront Park

Developed and Undeveloped Viewpoints

Viewpoints are public places along the Willamette Greenway Trail that provide resting or stopping points to view the river and surrounding environment. The *Willamette Greenway Plan* (1987) identifies sites that require the construction of public viewpoints as part of new development or redevelopment. On Map 4, viewpoints are classified as developed and undeveloped. Undeveloped viewpoints are those that are designated in the *Willamette Greenway Plan* (1987) and have not yet been built.

Greenway View Corridors

View corridors are public or private rights-of-way that provide unobstructed views to the river from nearby neighborhoods or business districts. The *Willamette Greenway Plan* (1987) designates 23 rights-of-way as view corridors. Thirteen of the designated greenway view corridors are on the west side of the river in the central city except for one just south of the Hawthorne Bridge. The remaining view corridors are located south of the Ross Island Bridge, in the vicinity of Willamette Park and Sellwood Riverfront Park.

Scenic View Vantage Points

Scenic view vantage points are places that have clear views of the city, mountains, or bridges. The vantage points identified on Map 4 are documented in the *Scenic Resources Protection Plan* (1991). These are generally located in parks or along public rights-of-way and may, or may not, be developed as viewpoints.

Developed viewpoint at SE Caruthers

Scenic view vantage point of the Albina Yard and downtown Portland from Overlook Park

Greenway view corridor at SE Clay

Developed viewpoint at McCarthy Park

MAP 5

Base Zones and Plan Districts

Map 5, on pages 19 and 20, depicts the base zones and plan districts of the *Portland Zoning Code* near the Willamette River.

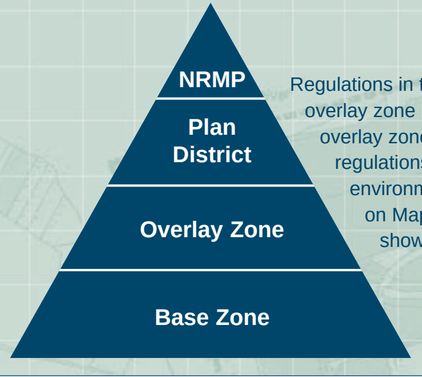
Base Zones

Base zones regulate general land use patterns envisioned for the city. The source of this information is the Bureau of Planning's GIS zoning data (July 2000) that is used for Portland's official zoning maps. All properties in the city are mapped with base zone designations that fall into the general categories of single and multi-dwelling residential, commercial, industrial, employment, and open space. These base zone groupings are comprised of more specific categories listed in Table 3 below. Each base zone has a general land use specification but also permits other uses. For example, commercial zones allow residential uses. This map does not represent existing land uses but rather, the desired land use pattern set out in the goals and policies of Portland's *Comprehensive Plan* (1999). The land use pattern illustrated on the map is implemented through the *Portland Zoning Code,* Chapter 33.100–33.140. The code also sets development, density, and design standards for new development and property alterations.

Plan Districts

Plan districts are established to address issues unique to a specific area in the city when base zone and overlay zone regulations are inadequate to achieve desired results. The unique characteristics of the areas may be based on factors such as environmental, economic, or historic attributes. Each plan district has its own specific set of regulations that supercede base zone and overlay zone provisions to achieve district-specific objectives. Those directly adjacent to the river are the Central City Plan District, the Swan Island Plan District, and the Macadam Plan District. Plan district regulations are implemented through the *Portland Zoning Code,* Chapter 33.500–33.585.

FIGURE 5:
Hierarchy of Land Use Regulations



Regulations in the *Portland Zoning Code* are organized into a hierarchy. For example, overlay zone regulations supercede base zone regulations on property that is subject to overlay zone regulations. If a property is subject to both overlay zone and plan district regulations, plan district regulations take precedence. NRMPs take precedence over environmental overlay zone regulations.Base zones and plan districts are illustrated on Map 5. Overlay zones and natural resource management plan (NRMP) areas are shown on Map 6.

TABLE 3:
Generalized Base Zone Sub-Categories

Open Space	Single Dwelling Residential	Multi-Dwelling Residential	Commercial	Employment	Industrial
Open Space (OS)	Farm and Forest (RF)	Townhouse Multi-dwelling (R3)	Neighborhood Commercial 1 (CN1)	General Employment 1 (EG1)	General Industrial 1 (IG1)
	Limited Single Dwelling (R20)	Low Density Multi-Dwelling (R2)	Neighborhood Commercial 2 (CN2)	General Employment 2 (EG2)	General Industrial 2 (IG2)
	Low Density Single Dwelling (R10)	Medium Density Multi-Dwelling (R1)	Office Commercial 1 (CO1)	Central Employment (EX)	Heavy Industrial (IH)
	Medium Density Single Dwelling (R7)	High Density Multi-Dwelling (RH)	Office Commercial 2 (CO2)		
	High Density Single Dwelling (R5)	Central Residential (RX)	Mixed Commercial/Residential (CM)		
	Attached Residential (R2.5)	Institutional/ Residential (IR)	Storefront Commercial (CS)		
			General Commercial (CG)		
			Central Commercial (CX)		

Note: See Portland Zoning Code on the Bureau of Planning website, www.planning.ci.portland.or.us, for precise information on allowable uses in the base zones.

MAP 6

Overlay Zones and Urban Renewal Districts

Map 6, on pages 21 and 22, illustrates the scenic, environmental, design, and greenway overlay zones, seven urban renewal districts and the natural resource management plan areas surrounding the Willamette River.

Overlay Zones

Overlay zones carry out Portland's *Comprehensive Plan* goals and policies through regulations that address the unique characteristics of specific areas throughout the city. Overlay zones are applied in conjunction with base zones and alter base zone regulations to meet specific goals. The information displayed on the map is derived from the Bureau of Planning's GIS zoning data. Overlay zone regulations are implemented through the *Portland Zoning Code*, Chapter 33.400–33.480.

Scenic Resource Overlay Zones

The scenic resource overlay zone is a zoning tool used to implement the policies of Portland's *Scenic Resources Protection Plan* (1991). This overlay zone identifies where specific development standards for view corridors and scenic corridors are applied in relation to new development or redevelopment. Scenic resource overlay zones are implemented through the *Portland Zoning Code*, Chapter 33.480.

FIGURE 6:
Greenway Overlay Zones

River Natural
Protects, conserves, and enhances land of scenic quality or of significant importance as wildlife habitat.

River Industrial
Encourages and promotes the development of river-dependent and river-related industries that strengthen the economic viability of Portland as a marine shipping and industrial harbor, while preserving and enhancing riparian habitat and providing public access where practical.

River General
Allows for uses and development that are consistent with the base zoning that allow for public use and enjoyment of the waterfront, and that enhance the river's natural and scenic qualities.

River Recreational
Encourages river-dependent and river-related recreational uses that provide a variety of public access opportunities to and along the river, and enhances the river's natural and scenic qualities.

Environmental Overlay Zones

The environmental overlay zones protect natural resources and functional values identified by the City as providing public benefits. Large areas subject to environmental overlays include Smith and Bybee Lakes and Forest Park. Natural areas located along the Willamette River are protected through the Greenway River Natural Overlay Zone and by reference to the *Lower Willamette River Wildlife Habitat Inventory.* Environmental overlay zones are implemented through the *Portland Zoning Code,* Chapter 33.430. The environmental overlay zones are as follows:

Environmental Protection Overlay Zone — Provides the highest level of protection to the most important resources and functional values identified by the City. Development in this zone is only approved in rare and unusual circumstances.

Environmental Conservation Overlay Zone — Conserves important resources and functional values in areas where they can be protected while allowing environmentally sensitive urban development.

Natural Resource Management Plan Areas

Map 6 illustrates both the Smith and Bybee Lakes and the Forest Park Natural Resource Management Plan Areas. The *Forest Park Natural Resource Management Plan* (1995) protects Forest Park's natural resources and enhances its recreational and educational resources. The *Smith and Bybee Lakes Natural Resource Management Plan* (1990) seeks to implement the management framework, identify funding, and institute the processes needed to restore and maintain the Smith and Bybee Lakes in their original natural condition. Natural resource management plan areas are implemented through the environmental overlay zone, Chapter 33.430 in the *Portland Zoning Code*.

Greenway Overlay Zones

The greenway overlay zones are intended to protect, conserve, enhance, and maintain the natural, scenic, historical, economic, and recreational qualities of the lands along the Willamette River. The greenway overlay zones include river natural, river general, river recreational, and river industrial. Descriptions and map notations are described in Figure 6. Greenway overlay zones are implemented through the *Portland Zoning Code,* Chapter 33.440.

Design Overlay Zones

The design overlay zone encourages greater urban and architectural design sensitivity in parts of the city with important scenic, architectural, or cultural value. This overlay zone applies to design districts and sub-districts with established design guidelines. The Central City and the Macadam Avenue corridor are examples of areas, adjacent to the river, that are subject to established design guidelines. Design overlay zones are implemented through the *Portland Zoning Code,* Chapter 33.420.

Urban Renewal Districts

Map 6 also shows the urban renewal districts around the Willamette River. The purpose of urban renewal is to help communities improve and redevelop areas that are deteriorated, unsafe, have a lack of infrastructure such as streets, utilities and sidewalks, or have extensive vacant and underutilized property. The revitalization efforts are paid for by urban renewal bonds, which are eventually paid off by the rise in property tax revenue from the urban renewal area. The urban renewal districts that are shown on Map 6 include: Downtown Waterfront, South Park Blocks, Central Eastside, Oregon Convention Center, River District, North Macadam, and Interstate Corridor.

Two Historic Districts Along the Willamette River

The Yamhill and Skidmore Fountain/Old Town Historic Districts, known for their large collection of mid-to-late 19th century buildings in the Central City, are the only historic districts next to the Willamette River. The nomination forms that state the significance of each district do not mention their historical relationship to the Willamette River.

MAP 7

Current Land Ownership

Map 7, on pages 23 and 24, illustrates public and private land ownership. This information was obtained from the Multnomah County Tax Assessor's records as of July 1999. The Bureau of Planning updated this information in 2000. Ownership categories include private landowners with more than 50 acres either completely within or intersecting the greenway overlay zone. The map also shows public land ownership throughout the Willamette River corridor. Public landowners include the City of Portland, Multnomah County, Metro, the State of Oregon, the U.S.A., and the Port of Portland as listed in Table 4. Private land owners are shown in Table 5.

Figure 7 shows the percentage of linear riverfront owned by public and private interests. Approximately 56 percent of the riverfront (20.8 miles) is in public ownership while the remaining 44 percent (17.2 miles) is in private ownership.

TABLE 4:
Public Landowners within the Greenway Overlay Zone*

Landowner	Approximate Number of Acres
Port of Portland	804
City of Portland	415
State of Oregon	34
U.S.A.	28
Metro	17

**Includes public landowners with acres completely within or intersecting the greenway overlay zone.*

Source: Multnomah County Assessment and Taxation (ownership) and Bureau of Planning GIS (acreage) as of July 1999. Some information updated by the Bureau of Planning 2001.

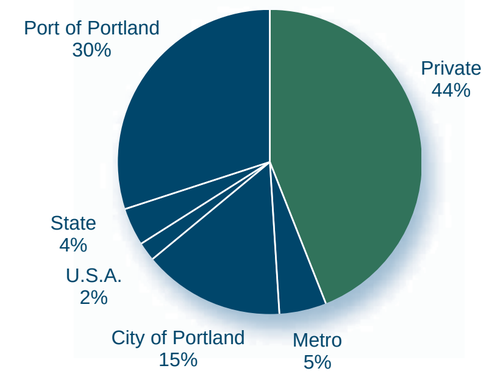
TABLE 5:
Largest Private Landowners within the Greenway Overlay Zone*

Landowner	Approximate Number of Acres
Ross Island Sand and Gravel Company	186
Schnitzer Investment Corporation	166
Oregon Steel Mills Incorporated	148
Oregon Washington Railroad	104
University of Portland	86
Portland General Electric Company	85
Wacker Siltronic Corporation	79
Atochem North America Incorporated	59
Gunderson Incorporated	55

** Includes private landowners with more than 50 acres either completely within or intersecting the greenway overlay zone. Calculations are based on primary landowners according to the Multnomah County Tax Assessor's records as of July 1999.*

Source: Multnomah County Assessment and Taxation (ownership) and Bureau of Planning GIS (acreage) as of July 1999. Some information updated by the Bureau of Planning 2001.

FIGURE 7:
Percentage of Linear Riverfront in Public and Private Ownership



Port of Portland

City of Portland, Oaks Bottom Wildlife Refuge

University of Portland

8 Existing Land and River Uses

Map 8, on pages 25 and 26, focuses on the waterfront land use pattern. Industry is the predominant use, particularly in the working harbor downstream of the Broadway Bridge. To illustrate the marine industrial context of the harbor, the map shows types of industrial uses, names of cargo dock operators, and the associated network of railroads and truck routes. In-water structures (such as docks), properties with river-dependent uses (those that require access to the river for transportation or recreation), and existing and proposed light rail and streetcar lines are also shown. The land use inventory area generally extends from the river to the nearest continuous street or railroad.

Land Uses

Map 8 depicts primary land uses, in contrast to accessory uses. Primary uses are the activities of chief importance on a parcel, such as manufacturing or residential; while accessory uses are incidental to the primary use, such as a parking lot or dormitory on a university campus. The Bureau of Planning developed the land use information using Port of Portland publications *(1997 Portland Harbor Land Use Inventory; South Rivergate: Here's Who's Here, 1992)*, Multnomah County Assessment and Taxation data (October 1999), aerial photographs (1998), and site observation. The land use categories shown on the map are described in Table 6.

River-Dependent Uses

Properties with a use that must be located on, in, or adjacent to the river, because the use requires river access for waterborne transportation or recreation, are shown on the map as river-dependent uses. Examples include marine cargo terminals, ship repair yards, barge services, dredge facilities, U.S. Coast Guard facilities, and recreational boat marinas.

TABLE 6:
Land Use Categories

Manufacturing
Manufacturing, processing, fabrication, or assembly of goods. Examples in the inventoried area include scrapmetal processing, cement production, fiber optic cable manufacturing, semiconductor manufacturing, and specialty chemicals manufacturing.

Marine Cargo
Loading or unloading of ships and associated storage and distribution of cargo. Examples include the Port of Portland terminals, private grain elevators, and petroleum storage facilities.

Warehousing
Storage, distribution, and wholesale trade of goods, except for marine cargo facilities and rail yards which are categorized separately. These facilities typically rely on trucks for freight distribution.

Railroads
Main freight railroad lines, rail yards, and associated waterfront properties owned by railroad operators.

Industrial Services
Repair or service related to machinery, equipment, products, or by-products. Waterfront examples include ship repair, barge services, and dredge facilities.

Utilities
Infrastructure services, such as those related to water supply, sewer, electrical, communication, natural gas, and solid waste.

Mining
Minerals extraction for off-site use. Gravel extraction at Ross Island Lagoon and Hardtack Island is the only mining use in the inventoried area.

Residential
Household and group living facilities. Tenancy is arranged on a month-to-month or longer basis. Houseboats are also a residential use.

Commercial
Retail trade and services for the general public, offices, and lodging.

Mixed use
Combination of residential and commercial or industrial uses on a parcel.

Institutions
Community services (typically by public or non-profit providers), schools, colleges, medical centers, and religious institutions. Riverfront examples include Oregon Museum of Science and Industry and the University of Portland. Utilities, parks, and open spaces are shown in separate categories and not as institutions.

Vacant
Entire parcels with no usable buildings or improvements. Most examples are undeveloped land. Other examples include improved properties that are constrained by inconsistent zoning, site contamination, or inadequate infrastructure. Vacant does not include parcels that are actively used for outdoor storage of machinery, equipment, products, or by-products. It does not include parcels with usable buildings that are temporarily unoccupied.

Freight Network

Supporting Portland's economic role as an industrial and freight distribution center, the working harbor area is a hub for marine, rail, and truck transportation. Map 8 shows the harbor area, main freight railroad lines, rail yards, and regional truck routes. The harbor's 40-foot deep shipping channel for oceangoing vessels is maintained along the Willamette River to the Broadway Bridge, encompassing about two thirds of the Willamette's length through Portland, and along the Columbia River to the Port of Portland Terminal 6. Barge transportation extends further up-river on the Willamette and Columbia Rivers.

Map 8 shows the main and branch rail lines designated on the Regional Freight System map in the *1999 Regional Transportation Plan.* Two transcontinental railroads operate along both sides of the harbor. The Union Pacific main line follows the river's east side between the Hawthorne Bridge and Swan Island, with spur lines extending to other parts of the harbor. The Burlington Northern-Santa Fe main line through Portland extends along the river's west side into the Northwest Industrial District, crossing at the Railroad Bridge. Map 8 also shows the associated rail yards used for railcar switching, loading, and assembling trains.

The trucking network depicted on Map 8 shows regional truck routes, major truck streets, minor truck streets, and truck district streets (Transportation Element of the Portland *Comprehensive Plan*). Interstates 5 and 84 intersect in Portland near the river, and connect with highways and truck streets that serve the industrial districts along Portland Harbor.

DATA SOURCES

Data layer	Original GIS Data Sources	Date	Data Capture Scale
100-Year Flood Plain	U.S. Army Corps of Engineers. Digitized using Federal Emergency Management Association (FEMA) flood plain maps.	1992	1:24,000
1996 Flood Inundation Areas	U.S. Army Corps of Engineers developed from 1996 digital photography	1996	Unknown
Aerial Photograph	Spencer B. Gross, Inc.	1998	20x20 foot pixel resolution
Assessor Data	Multnomah County Assessment and Taxation 1999 and 2000 data. Some information updated by the City of Portland, Bureau of Planning.	1999-2000	Independent of Scale
Base Zones	City of Portland, Oregon, Bureau of Planning, Official Zoning Maps	2000	1:100-1:400
Bathymetry	*Willamette River Main Channel:* City of Portland, Bureau of Environmental Services developed from U.S. Army Corps of Engineers survey information, City Harbor Master and NOAA navigation maps	2000	Unknown
	Swan Island Lagoon, Holgate Slough, Multnomah Channel, and the Columbia River: City of Portland, Bureau of Planning based on 2000 NOAA Sounding and Bridge Clearance Maps	2000	Unknown
Conceptual North Portland Trails	City of Portland, Bureau of Parks and Recreation	2000	Unknown
Existing Land Use	*North of Steel Bridge:* City of Portland, Bureau of Planning based on Port of Portland 1998 data. Some information updated by the Bureau of Planning through research in 2001.	1998	Unknown
	South of Steel Bridge: City of Portland, Bureau of Planning based on 1999 Multnomah County Assessment and Taxation data. Some information updated by the Bureau of Planning through research in 2001.	1999	Unknown
Freeways	City of Portland, Bureau of Planning	1989-1994	Unknown
Habitat Sites	Adolfson Associates, Inc., Portland, Oregon for the City of Portland, Bureau of Planning	2000	Unknown
Land Ownership	Multnomah County Assessment & Taxation. Some information updated by the Bureau of Planning through research in 2001.	1999	1:100-1:400
Light Rail	Metro, RLIS data	2001	Unknown
Natural Resource Management Plans	City of Portland, Bureau of Planning	2000	1:100-1:400
Outfalls	*North of Fremont Bridge:* City of Portland, Bureau of Environmental Services	2000	Unknown
	South of Fremont Bridge: Adolfson Associates, Inc., Portland, Oregon, for the City of Portland, Bureau of Planning	1999	Unknown
Overlay Zones	City of Portland, Bureau of Planning, Official Zoning Maps	2000	1:100-1:400
Parks and Open Space	*Parks:* Metro, RLIS data	2000	1:100-1:400
	Open Space: City of Portland, Bureau of Planning	2001	1:100-1:400
Plan Districts	City of Portland, Bureau of Planning, Official Zoning Maps	2000	1:100-1:400
Portland Bikeway Network	City of Portland, Office of Transportation	2000	1:100-1:400
Portland Harbor Sites	City of Portland, Bureau of Planning from DEQ web page: http://www.deq.state.or.us/wmc/cleanup/PortlandHarbor/StudyArea.htm	2000	Unknown
Portland Streetcar	City of Portland, Bureau of Planning from Portland Streetcar web page: http://www.portlandstreetcar.org	2000	Unknown
Railroads (cartographic)	Metro, RLIS data	1995	Unknown
Railroads (freight network)	Metro for the Regional Transportation Plan	1999	Unknown
Riverbank Composition	GreenWorks, PC Landscape Architecture, Portland, Oregon, for the City of Portland, Bureau of Planning. Some information updated by the Bureau of Planning 2001.	1999	Unknown
Rivers and Lakes	Metro, RLIS data	1994	Unknown
Scenic View Vantage Point	City of Portland, Bureau of Planning	2000	Unknown
Steep Slopes	U.S. Geological Survey	1993	1:24,000
Streams	Metro, RLIS data	1999	1:100-1:400
Taxlots	Multnomah County Assessment and Taxation	2000.	1:100-1:400
Truck Routes	City of Portland, Portland Department of Transportation	2000	Unknown
Urban Renewal Districts	City of Portland, Portland Development Commission	2000	Unknown
Willamette Greenway Trail	City of Portland, Bureau of Parks and Recreation. Updated by the City of Portland, Bureau of Planning 2001	2001	1:100-1:400
Willamette Riverbank Conditions	GreenWorks, PC Landscape Architecture, Portland, Oregon for the City of Portland, Portland Development Commission	1999	Scale undetermined
Willamette River Parks, Greenway View Corridors, Greenway Viewpoints, Public Boat Launches, Public Boat Docks	Adolfson Associates, Inc., Portland, Oregon for the City of Portland, Bureau of Planning	2000	Scale undetermined

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Metro, Portland, Oregon. *2000 Regional Transportation Plan,* 1999.

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Photo credits

Inside front cover and table of contents background image: *Portland Panorama* by C.E. Watkins, 1867. Courtesy of the Oregon Historical Society. (OrHi 21588, OrHi 21589)

Page 1: *Early Portland waterfront and Constructing Harbor Drive along the Willamette River in the 1940s*: Oregon Historical Society. *Building the seawall, 1929*: Stanley Parr Archives and Records Center.

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