2007

Ecological landscapes : Connecting neighborhood to city and city to region

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ECOLOGICAL LANDSCAPES: CONNECTING NEIGHBORHOOD TO CITY AND CITY TO REGION

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"Connectivity is needed both within a particular network and across many networks of human, built, and natural systems in a region. Some structures and patterns would be more appropriately understood at a regional and metropolitan scale; others, at the city or neighborhood scale; and still others at the site scale."

Gerling and Kellett, Skinny Streets & Green Neighborhoods, Design For Environment and Community, 2006

While many factors are unique to communities on both sides of the Columbia River, our local and regional landscapes unite us and provide a shared sense of place. Bald eagles from the headwaters of the Tualatin basin are just as likely to forage in the Vancouver Lake lowlands as on Sauvie Island. Proximity to the Columbia Gorge, coast, high desert, and the Cascades adds to the region's mystique and quality of life. But it's the more proximate landscapes, those within our immediate radius of reach, that we treasure most. What matters most to the region's residents are their streetscapes, neighborhood parks, and regionally significant landscapes, from Clark County's Lewis River to the agricultural fields, wetlands, and floodplains along the Tualatin and Pudding rivers, and from the Tillamook Forest to the Columbia, Sandy and Clackamas gorges.

This paper summarizes past and current efforts to delineate the landscapes that define our region's sense of place, contribute to the region's biodiversity and ecological health, provide recreational opportunities, and ensure access to nature nearby—the landscapes Portland State University's Joe Poracsky refers to as the region's "emerald compass" (Poracsky, 2000, 13-16). We also describe some of the region's efforts to integrate its green infrastructure with the built environment across multiple landscape scales to attain a more sustainable metropolitan region.

Oaks Bottom Wildlife Refuge and Ross Island with Portland downtown skyline.

Salmon Creek Greenway, Clark County, Washington. Photos: Mike Houck

Early Park and Landscape Planning

Comprehensive efforts to describe and protect our special landscapes within the city of Portland date back to 1903 when landscape architect John Charles Olmsted observed that Portland was "most fortunate, in comparison with the majority of American cities, in possessing such varied and wonderfully strong and interesting landscape features" (Olmsted, 1903, 34). Olmsted's proposed "system of public squares, neighborhood parks, playgrounds, scenic reservations, rural or suburban parks, and boulevards and parkways" was built around features that are today's landscape icons: Forest Park, Mt. Tabor, Macleay Park, and the Terwilliger Parkway (Olmsted, 1903, 36-68).

Park and landscape planning at the regional scale began, when in 1971, the Columbia Region Association of Governments (CRAG) laid out a bi-state Urban-Wide Park and Open Space System (Figure 1) based on the premise that "open spaces are needed not only at the coast, or in the Columbia River Gorge, or in the mountains, distant from the daily urban hubbub, but also for immediate enjoyment and use within the urban complex." CRAG's regional open space system incorporated "environmental features which have stamped the region with its unique form and character, rivers and streams, Flood plains, and the high points" like Multnomah Channel, Sauvie Island, Lake River, Salmon and Burnt Bridge creeks, Boring Lava Domes, Government Island and the Sandy River Delta (CRAG, 1971, 3-4).

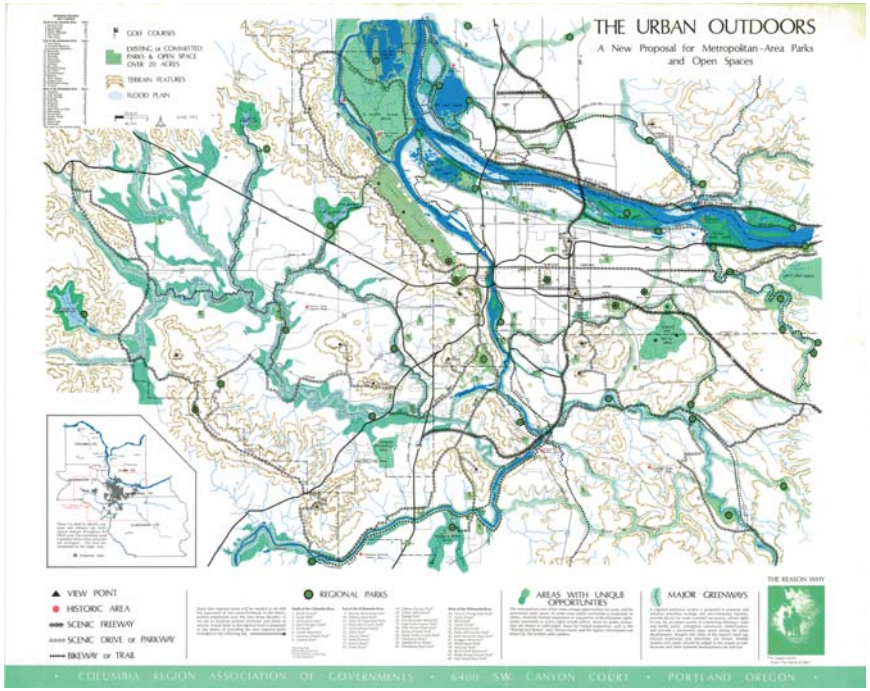

Figure 1: Columbia Region Association of Governments (CRAG) Bi-State Urban-Wide Park and Open Space System
Source: Metro

Regional Landscape Planning

Metropolitan Greenspaces Initiative

By the late 1980s, alarm at the loss of local greenspaces (Figure 2) led to the proliferation of grassroots citizen organizations throughout the region. This coalition of park, trail and greenspace advocates—inspired by the Olmsted plan, CRAG's Urban Outdoors scheme, and recommendations of the Columbia-Willamette Futures Forum's regional park study—ignited a grassroots effort to create a Portland-Vancouver parks and greenspaces system (Howe, 1999).

Figure 2: Loss of forest canopy in the upper Cedar Mill Creek Watershed between 1990 and 2002. Rapid growth in the 1990s resulted in the loss of roughly 16,000 acres of natural areas, an area roughly the size of the City of Gresham.
Source: Jim Labbe

Working with a regional parks forum, Metro initiated a bi-state inventory of natural areas and in 1989 contracted with Bergman Photographic Services to fly the region to capture color infrared photographs of Clark County and the three counties on the Oregon side of the Columbia (Metro, 1989). PSU geographer Joe Poracsky digitized these photographs, creating for the first time a map depicting all of the region's remaining natural areas. Three years later, using this map to prioritize acquisition opportunities, a Greenspaces Master Plan calling for a "cooperative regional system of natural areas, open space, trails and greenways for wildlife and people in the four-county metropolitan area" was adopted (Metro, 1992). While Olmsted's rationale for an interconnected system of boulevards and parkways was based primarily on aesthetics and public access (Olmsted, 1903) the Greenspaces Master Plan integrated principles of landscape ecology with the complementary goal of providing equitable accessibility to parks and natural areas via a regional system of trails, paths, and greenways (Metro, 1992; Parks 2020 Vision, 2001).

In 1995 a $135.6 million bond measure was approved by over 60% of the region's voters (Oregon) with which Metro purchased 8,140 acres including 74 miles of river and stream riparian areas and added to the expanding regional trail network (Figure 3) (Metro, 2006b). The region's voters approved another $227.4 million bond in November, 2006 which will allow for the acquisition of another 5,000 acres of natural areas and trail corridors by Metro as well as park, trail and natural area projects by local park providers with their $44 million share of the regional bond. A $15 million "nature in neighborhood" competitive grant program that will also allow nonprofit organizations, neighborhoods, and local park providers to "re-green" nature and park deficient neighborhoods (Houck, 2006).

Integrating Greenspaces and Regional Growth Management

In addition to park and greenspaces planning, land use regulations have been adopted to protect water quality and fish and wildlife habitat and to reduce natural hazards as part of the Region 2040 planning process (Metro, 1998) (Metro, 2005a). In August, 2005 the Metro Council established a regional Nature In Neighborhoods fish and wildlife habitat protection and restoration program that covering 80,542 acres of the region's riparian or streamside corridors and fish and wildlife habitat inside and just beyond the Urban Growth Boundary (UGB) (Figure 3).

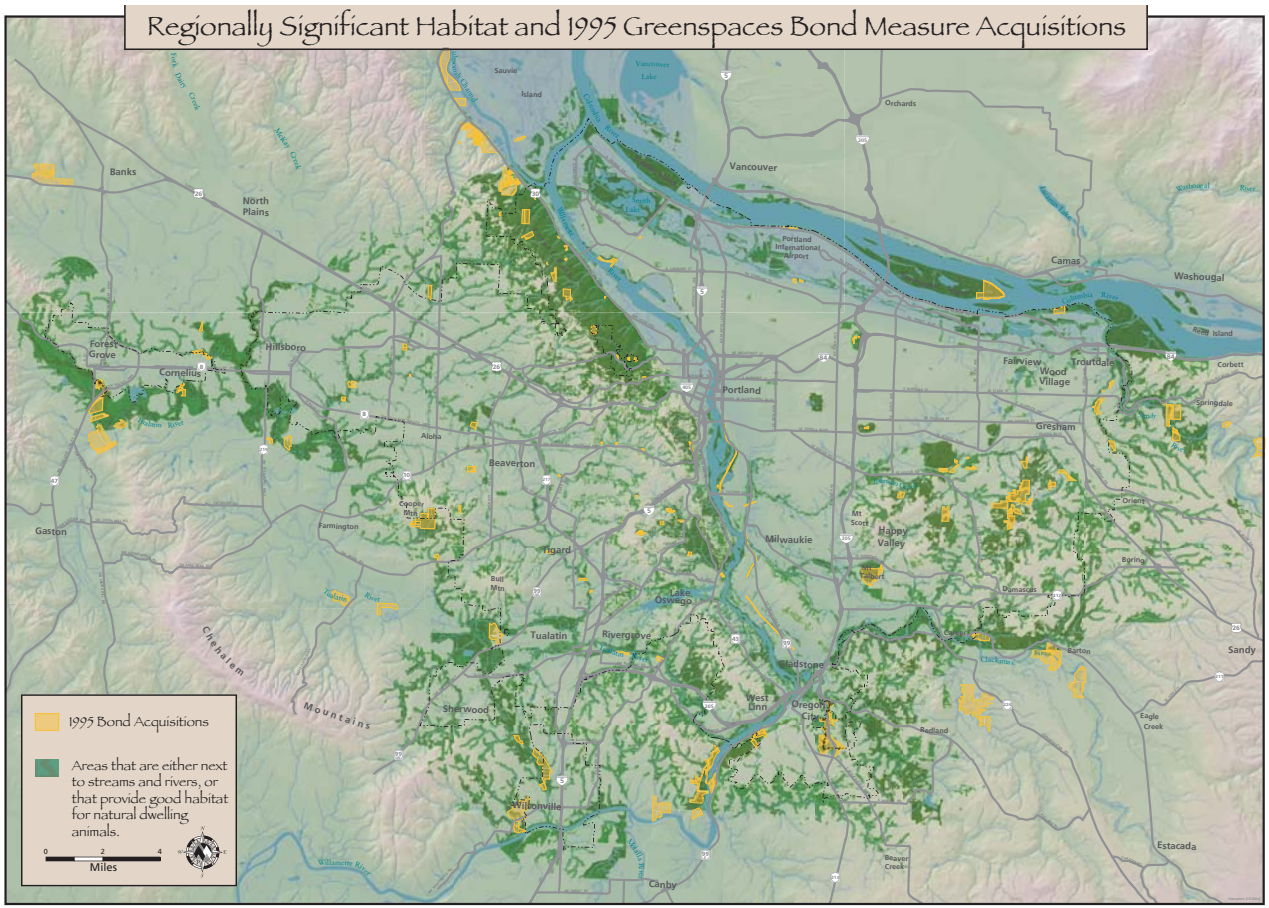

Figure 3: Metro Fish and Wildlife Habitat map depicting 80,000 acres of regionally significant fish and wildlife habitat inside and extending one mile outside the Portland region's Urban Growth Boundary. Source: Metro

Regulatory protections were applied to only 39,299 acres (49%) of the most significant streamside corridors, leaving over 40,000 acres of regionally significant fish and wildlife habitat inside the Portland region's UGB to be protected through voluntary, non-regulatory programs. Metro's Nature in Neighborhoods includes performance measures such as "preserving and improving streamside, wetland, and floodplain habitat and connectivity, increasing riparian forest canopy by 10%; limiting floodplain development to 10%; and preserving 90% of forested wildlife habitat within 300 feet of streams by the year 2015" (Metro, 2005a, 44-46).

Natural Area Planning in Clark County, Washington

"People who pay more attention to abstract figures than to realities are accustomed to look upon a river as a dividing line, so it appears on maps. But rivers are dividing lines from only one point of view: military attack. From every other standpoint the river basin as a whole is a unit." (Mumford, 1938)

Across the Columbia River similar efforts to acquire, protect, and restore natural resources and to create an interconnected parks, trails and natural areas system have been undertaken by Clark County and the City of Vancouver. In 2003, Clark County adopted its Conservation Areas Acquisition Plan, identifying critical habitat and greenway acquisition priorities within its 627 square mile planning area. The Conservation Futures Program, funded by a 6.25% per $1,000 assessed value property tax adopted in 1985, has made possible acquisition of 3,800 acres of shoreline, greenway, and fish and wildlife habitat (Clark County, 2003).

The county's new Conservation Areas Real Estate Excise Tax (CREET) will allow the purchase of additional critical habitat and greenways. Clark County's acquisition of farmland is justified in part because agricultural lands "abutting habitat and greenway areas provide complementary benefits and public value" (Clark County, 2003, 19). Acquisition priorities include the East fork and upper Lewis River, Salmon Creek, Vancouver Lake Lowlands, Washougal River, Lacamas Lake and Creek, and Burnt Bridge Creek. Vancouver-Clark Parks and Recreation District also owns 7,400 acres of park land, including 1,106 acres of natural areas and 1,826 acres of trails and greenways (Vancouver-Clark Parks, 2006).

Policy Implications

It remains to be seen how performance measures will be evaluated and how efficacious stewardship, education, and acquisition programs will prove to be over time. One concern is whether upland habitats will be protected. New urban expansions provide the opportunity for enhanced protection of natural areas. Oregon's Big Look process offers an opportunity to incorporate more holistic ecosystem protection and restoration than the existing land use program achieves (Wiley, 2001). Finally, given our shared landscape and ecosystems, natural resource planning between Clark County and the Oregon side of the Columbia should be better integrated. Both Metro's New Look and regional parks, trails and greenspaces planning should be utilized to achieve that objective.

A New Look at the Regional Landscape

"I have found that people who feel very strongly about their own landscape are more often than not the same people who are pushing for better comprehensive planning. But it is the landscape that commands their emotions. Planning that becomes too abstract or scornful of this aspect will miss a vital motivating factor. The landscape element of any long-range regional plan, more than any other element can enlist a personal involvement. People are stirred by what they can see." (Whyte, 1968)

Metro's New Look is exploring new relationships between the built and natural environments and between rural and urban landscapes (Metro, 2006a). The New Look anticipates policies necessary to accommodate a million new residents within the next 25 years, while maintaining compact urban form, retaining quality of life, ensuring equitable access to parks and nature, and addressing issues of sustainability. A burgeoning population, development pressures on remnant greenspaces, and uncertainty surrounding Measure 37 impacts on the extra-UGB landscape make protection of the region's signature landscapes, inside and outside our cities and on both sides of the Columbia River, more urgent now than ever.

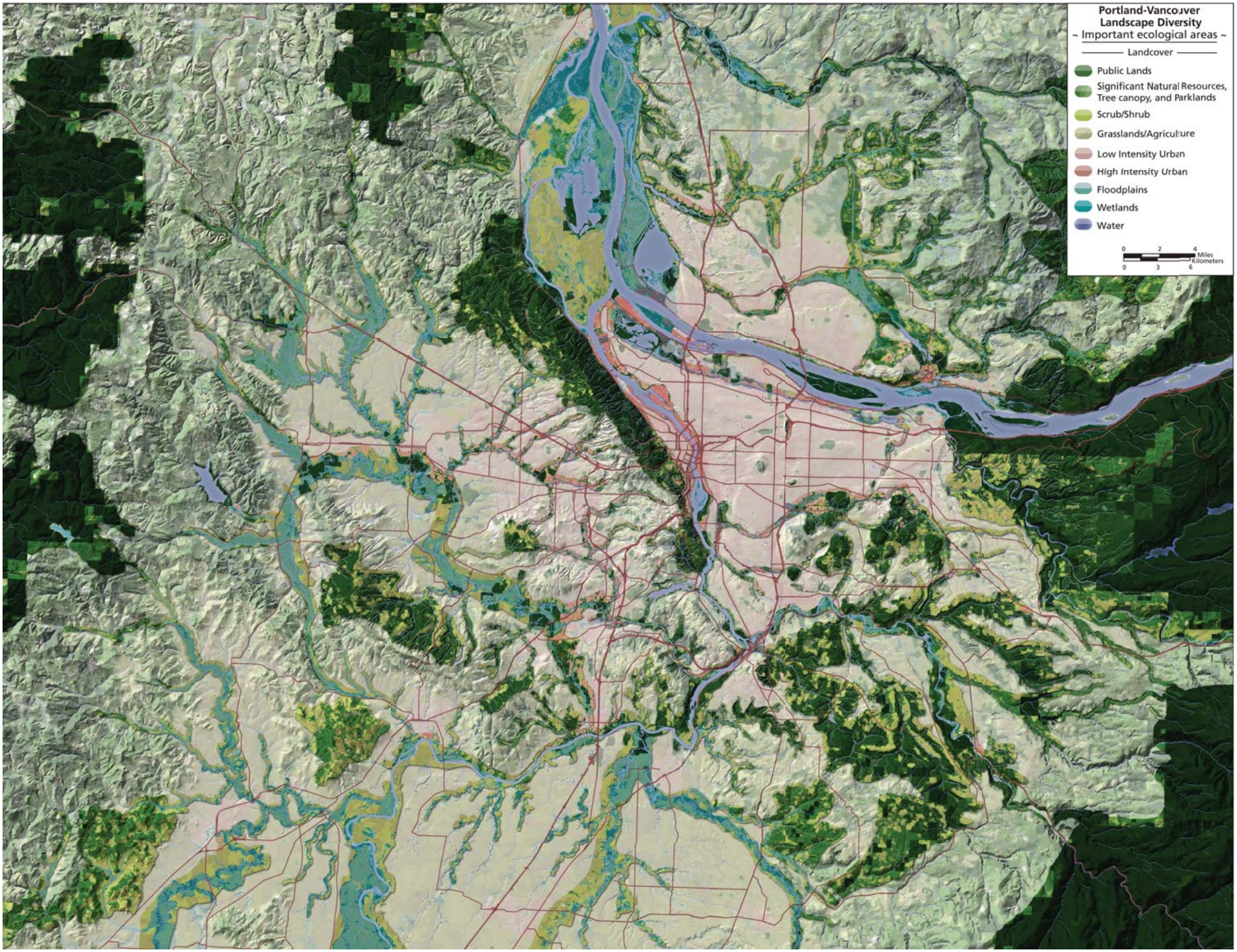

Figure 4: Working draft Greenspaces Policy Advisory Committee map of Ecologically Significant Landscapes Inside and Outside the Urban Growth Boundary in the Portland-Vancouver Metropolitan Region.

Integrating Urban and Rural Landscapes

For the past 30 years Oregon's land use program has focused on maintaining urban growth boundaries to create compact urban form and to protect rural working landscapes outside the UGB. Meanwhile, too little has been done to protect natural resources inside the UGB (Wiley, 2001). Metro's adoption of a 1996 regional Greenspaces Resolution raised the protection of natural resources to the same political and policy levels as farmland protection and maintaining a tight UGB.

In June, 2006 a regional mapping charette hosted by Metro's Greenspaces Policy Advisory Committee (GPAC), resulted in an ecologically based map delineating landscapes that landscape ecologists and park planners identified as regional landscape features that would (Metro, 2005b):

- Preserve significant natural areas for wildlife habitat and public use.
- Enhance the region's air and water quality.
- Connect the region's communities with trails and greenways.
- Provide sense of place and community throughout the bi-state metropolitan region.
- Support an ecologically sustainable metropolitan area.

Information from this charette was integrated with other natural resource data to create a composite map, covering 3,620 square miles (2.3 millions acres) of Columbia, Clark, Multnomah, Clackamas, Washington and Yamhill counties (Figure 4). Oblique aerial perspectives were also created to provide a more generalized landscape perspective, juxtaposing potential future farmland and natural area preserves (Figure 5).

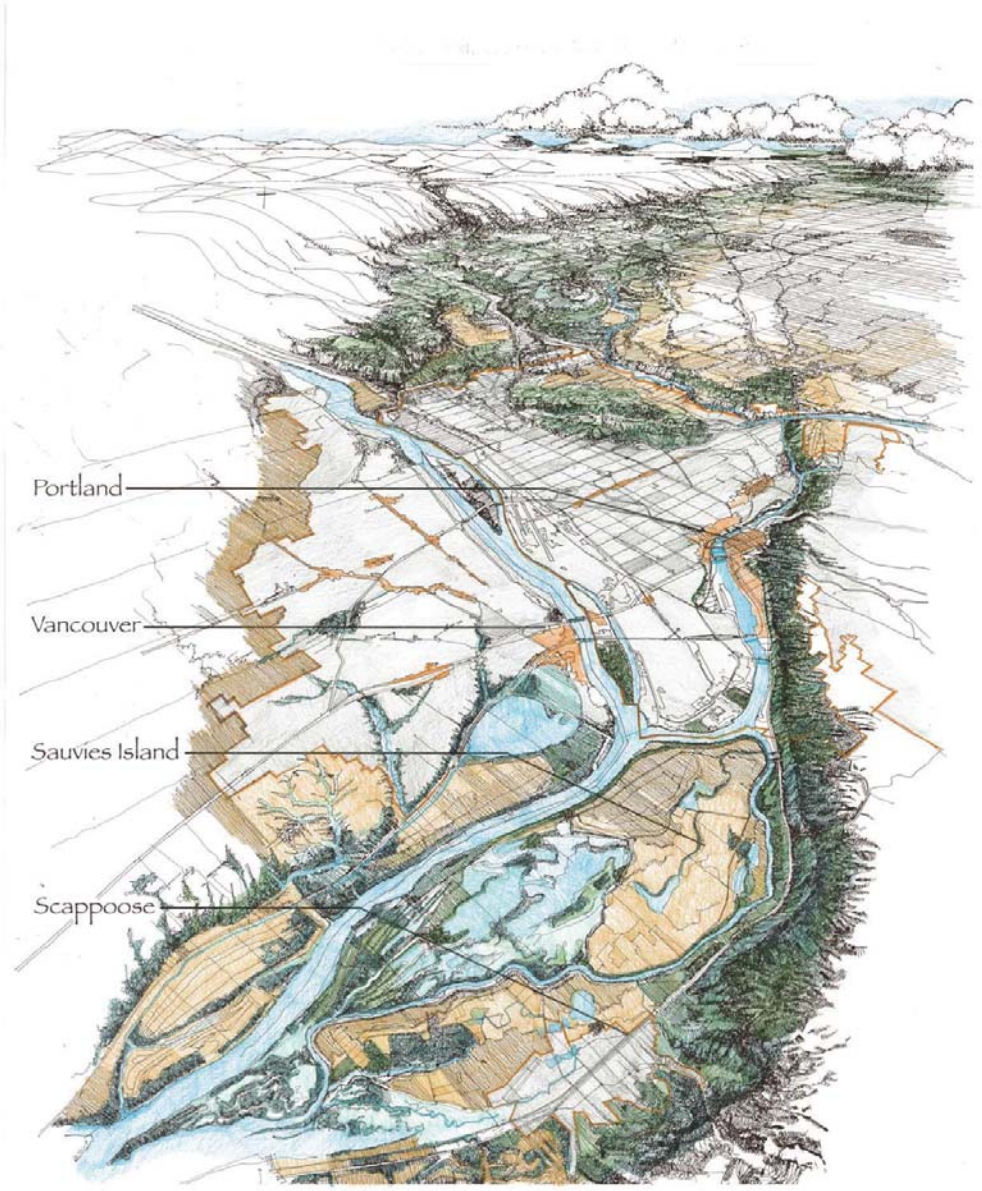

Figure 5: James Pettinari, Professor of Architecture at the U of O School of Architecture produced this oblique aerial view over Sauvie Island looking south over Vancouver and Portland.

Policy Implications

Information from the GPAC and New Look mapping processes provide critical data for identifying the natural areas component of the regional system of parks, trails, and natural areas and for future UGB expansion decisions. These maps will also aid in future ecosystem-based planning across the urban and rural landscapes on both sides of the Columbia River.

Planning Across Scales

Innovative Watershed Planning

"The belief that the city is an entity apart from nature and even antithetical to it has dominated the way in which the city is perceived and continues to affect how it is built. This attitude has aggravated and even created many of the city's environmental problems. The city must be recognized as part of nature and designed accordingly."

Anne Whiston Spirn, The Granite Garden, 1984

Creating an ecologically sustainable metropolitan region means ecological processes must be considered from a "nested" perspective, telescoping up and down the scale, integrating the built and natural environment, from large regional landscapes to watersheds and sub-watersheds, down to the individual neighborhoods and streetscapes. One key to implementing this landscape based planning is innovative watershed planning. Portland's newly adopted Watershed 2005 Plan, which seeks to "incorporate stormwater into urban development as a resource that adds water quality benefits and improves livability, rather than considering it a waste that is costly to manage and dispose of" (City of Portland Environmental Services, 2006, 15) is a good example of planning across landscape scales.

Portland's Watershed 2005 Plan "is built on the principle that urban areas do not have to cause damage to watershed health" and that "a healthy urban watershed has hydrologic, habitat, and water quality conditions suitable to protect human health, maintain viable ecological functions and processes, and support self-sustaining populations of native fish and wildlife species" (City of Portland Environmental Services, 2006, 38).

Photo: Mike Houck

Photo: Mike Houck

Photos: BES

Clockwise from top: Ecoroof on PSU residential building; Astor Elementary School before and after rain garden installation; stormwater infiltration, street retrofit on SW 12th and Montgomery at PSU.

Policy Implications

The Watershed 2005 Plan also mandates that watershed health be integrated into all city bureaus and policies and that potential impacts on stormwater be considered at the front end of project planning. In the Tualatin Basin, Clean Water Services' Healthy Streams Plan (Clean Water Services, 2005) promotes progressive watershed and stormwater management programs as well. A regional watershed and stormwater management advisory panel should be convened by Metro to identify the best elements of local watershed policies to craft a regionally consistent approach to watershed health and stormwater management.

Urban Forest Canopy

"The urban forest should be managed as a healthy ecosystem. Understood as green infrastructure, the urban forest is a interwoven system of landscapes performing multiple human and natural functions."

Gerling and Kellett, Skinny Streets & Green Neighborhoods,
Design for Environment and Community

The urban forest canopy, one of the most integrative and multi-functional elements of the region's green infrastructure, decreases urban heat island effect, reduces air pollution and energy consumption, absorbs greenhouse gases, enhances biodiversity, attenuates stormwater runoff, and provides numerous public health, aesthetic, and enhanced property values (Portland Parks and Recreation, 2003) (Netusil and Chattopadhyay, 2005).

Vancouver, Washington has inventoried its 46 square miles of urban forest canopy (City of Vancouver and Vancouver-Clark Parks, 2005) and a PSU study for Portland Park and Recreation's urban forestry program tracked urban forest canopy changes in a 126 square mile area covering nearly 100 Portland neighborhoods. The latter study found increases of 5% to 20% in forest canopy in many older nature-poor neighborhoods in North and Northeast Portland over a 30-year-period from 1972 to 2002 (Poracsky and Lackner, 2004). These increases were attributed in part to citizen-based tree planting programs. Metro has also inventoried the region's urban forest canopy as part of its Nature In Neighborhoods monitoring program.

Urban forest canopy over Portland's Park Blocks
Photo: Mike Houck

Policy Implications

The urban forest canopy's influence over multiple environmental, social and ecological parameters led the Portland-Multnomah County Sustainable Development Commission to consider using urban forest canopy trends as one of several "ecological indicators of sustainability" (City of Portland Office of Sustainability, 2006). A cooperative effort expanding the monitoring of urban forest canopy across the region should be undertaken and targets established for canopy retention and expansion.

Regional Equity: Access to Parks and Natural Areas

Access to public parks and to nature, whether public or private, underpins our regional growth strategy for compact, walkable, and livable communities. Provision of public open space is widely recognized as the quid pro quo for public acceptance of denser, more transit-oriented urban neighborhoods.

While natural landscapes unify the region, there are also disparities regarding access to these landscapes and public parkland. These disparities are a result of a number of factors including past policy decisions regarding where and how public investment has occurred, development patterns, access to affordable housing, and demographic changes. Today, most jurisdictions have neighborhoods that are deficient in access to parks or nature relative to the rest of the region. Most neighborhoods fall short of park access goals established by Metro, local park providers and non-governmental organizations (CLF, 2006). Given lack of public

financing and inadequate System Development Charges (SDC), park providers face chronic funding shortages that, without significant policy changes, are likely to exacerbate these deficiencies as the region grows (Metro, 2001).

How do cities and neighborhoods across the Portland-Vancouver region compare regarding access to parks and natural areas? Answering this question was one goal of the Regional Equity Atlas (CLF, 2006; Audubon Society of Portland, 2006), which measured access to public parks and proximity to private and public natural habitat.[1]

Access to Public Parks and Greenspaces

Park access and level of service within a geographic area can be measured using

- Walkable distance to nearest public park.
- Acres of public parks per capita.
- Diversity of park types.
- Social, economic, or cultural barriers to accessing public parks.

four criteria:
In assessing access, the Atlas measured the more objective factors of per capita parks and walkable distance to the nearest park, and calculated them by jurisdiction and neighborhood. The Atlas combines these measures into an integrated assessment of park access across the Portland-Vancouver region.

While now widely considered an insufficient measure of park access, acres of parkland per 1,000 residents has historically been the easiest way to measure and compare park service levels among communities. The more commonly used measure today is the percent of the population within walking distance from a public park. Increasingly, this criterion is becoming the preferred measure of park access (Harnik, 2003, 43). Roughly half of the region's urban population lives within ¼ mile walking distance from public parkland. Percentages range from 3% (Maywood Park) to 92% (Sherwood). Twenty-eight percent of jurisdictions have less than 50% of their populations living within ¼ mile from any public park. Access by this measure varies more widely between neighborhoods than jurisdictions. About half in the region have more than 50% of their populations living within a ¼ mile from any public parkland.
Figure 6 presents a more comprehensive measure of access to public parks and greenspace. It combines per-capita and walking distance measures into an integrated park access score for every location (1/4 acre) in the region along the walkable street and trail network. This measure of access accounts for the walking distances to reach the nearest public parkland, the quantity of that parkland, and the number of people who share it.

Areas particularly park deficient include Northeast Portland, West Gresham, Milwaukie, and Oak Grove. The developing city of Damascus has poor access despite its low population due to low acreage and the length of walking distances. Despite the larger districts with poor access, there is considerable local variability in access across the region. Pockets of poor access can be found in most corners of the region.

Proximity to Natural Habitat

We define "access to nature" as the chance to encounter the region's native fish and wildlife and to explore natural areas that sustain them. Definitions of "nature" in this context may vary over time and space with changes in cultural preferences or in the landscape itself. For example, it does not account for the return of urban forest canopy in many older urban neighborhoods. Nevertheless, we believe this definition has a strong basis in the region's history and shared culture as well as in contemporary assessments of individual and community preferences.

Nature-poor communities are concentrated in older urban centers, although similar nature deficient pockets can be found throughout the region. Using these data and the 2000 census, it was possible to calculate the acres of habitat per capita by neighborhood, jurisdiction, and for the region. Roughly 64% of the Portland metropolitan population inside the UGB lives within a linear quarter mile "as the crow flies" of a natural area. Fifteen of 28 jurisdictions have at least 90% of their populations living within ¼ mile of a natural area. The jurisdictions with the lowest ¼ mile access to a natural area are Cornelius (64%), Gresham (60%) and Portland (34%).

[1]To receive or review a copy of the CLF *Regional Equity Atlas*, please see www.slfuture.org.

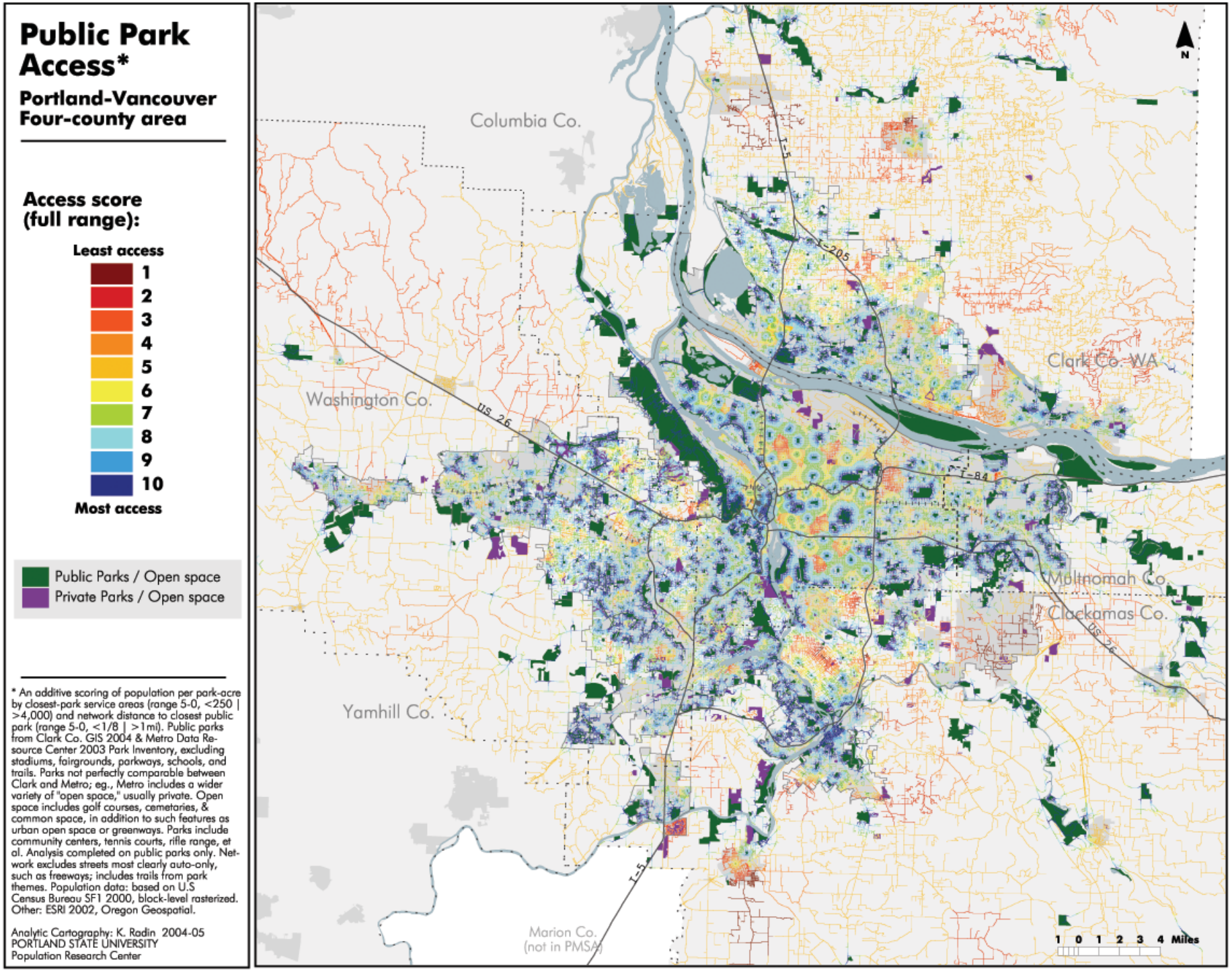

Figure 6: Public Park Access, Portland-Vancouver Metropolitan Region
Source: Coalition for a Livable Future

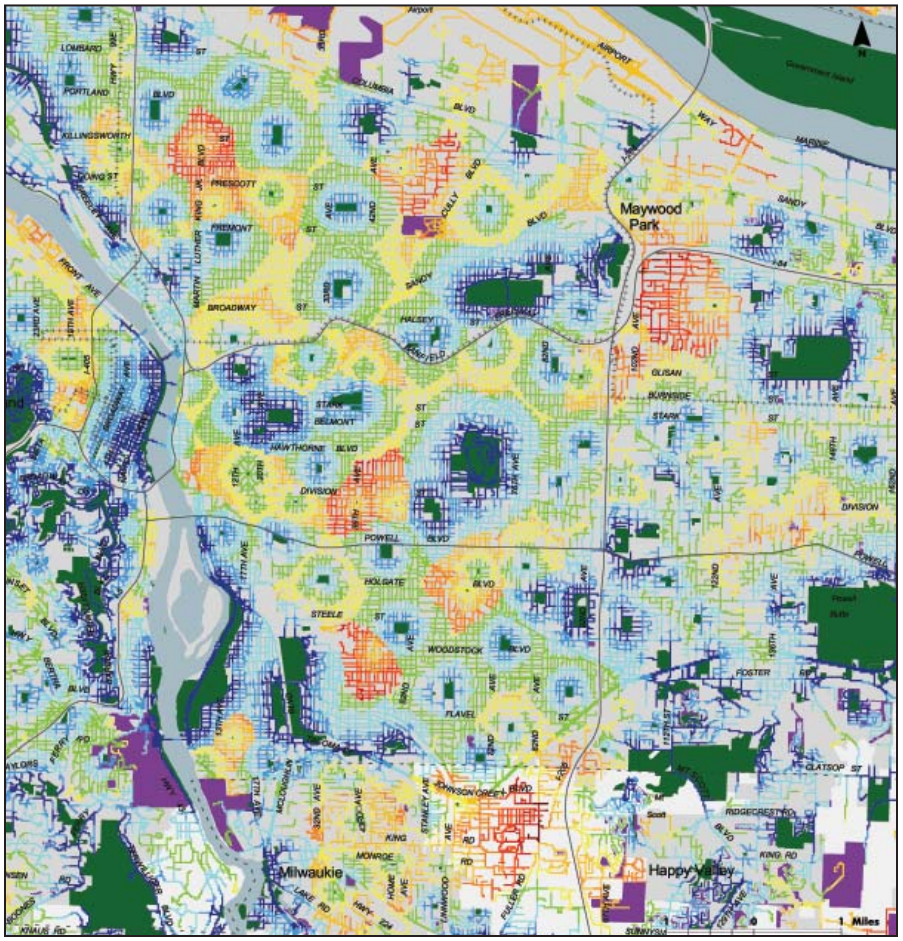

Figure 7: Public Park Access, Southeast Portland Close In.
Source: Coalition for a Livable Future, courtesy of Jim Labbe

Policy Implications

Expanding the quantity and accessibility of public parks and natural areas at the neighborhood scale will be increasingly important to reducing disparities among neighborhoods and across the region. Policymakers should consider two strategies for more equitable access. First, address wealth and income barriers by fostering diverse housing and transportation choices. This approach will help reduce disparities in access based on race, wealth, and income that exist in the region. Second, establish local and regional level of service goals and develop funding mechanisms to ensure basic levels of access across the region. Metro's Greenspaces Policy Advisory Committee, working with regional and local park and natural area providers, is taking a lead in these issues (Metro, 2005a).

Opportunities to increase public park and natural areas are greatest in newly urbanizing communities like Damascus. These areas are park deficient but also have abundant high quality habitat relative to the rest of the region. The value of and opportunity to re-nature existing urban areas is also needed. As older urban centers redevelop, new opportunities will emerge to enhance access to nature while restoring ecological functions.

Finally, most natural areas are not publicly owned yet still provide contact with nature in our neighborhoods. Therefore, educating private landowners regarding ecological stewardship of private property and fostering habitat-friendly development practices will be vital to sustaining access to nature in our region.

Conclusions

The region's residents care deeply about their landscape, not just the inspiring view of Cascades in the distance, but the "emerald compass" that frames the view in every direction, from the streetscape to the neighborhood; from the neighborhood to the city; and from the city to the region.

In order to create a livable, socially and environmentally just, and ecologically sustainable metropolitan region, the gray and green infrastructures must be integrated to ensure access to parks, trails, and greenspaces in every community and neighborhood. Policies that aim solely at protecting large landscapes within and outside our cities will not be sufficient to achieve ecological sustainability across the region. Greenspaces, parks, and trails must be recognized, valued, and funded as integral elements of the region's green infrastructure at every scale, large and small, across the urban landscape. Doing so will help us design cities where the built and the natural are interlaced, and where access to parks and nature is a part of our everyday lives.

A more detailed discussion with additional photos and maps can be found online at www.urbangreenspaces.org.

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