



A Regional Open Space Strategy for the Central Puget Sound Region



DECEMBER 2016



Regional Open Space Strategy (ROSS)
UNIVERSITY OF WASHINGTON
UW Green Futures Research & Design Lab

A Regional Open Space Strategy for the Central Puget Sound Region

December 2016

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This report and its appendices have been developed by the UW Green Futures Lab Regional Open Space Strategy staff, its project partners, and volunteer contributors over the course of six years, 2010- 2016. This report should not be considered an agreement by its funders, members of the Executive Committee, or project contributors. It is hoped that the research, proposed strategies, and planning tools contained herein will support creation of a conserved and enhanced open space system for our region. Professional staff and partners during the project's life have been:

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UW Green Futures Lab
December 2016



PREFACE

LaKell Havens moved to Seattle last year to work as a freelancer in the area's burgeoning film production industry. Originally from Utah, she spent the last 5 years in New York City studying and working in the most bustling city in the world. She finally realized she needed a change and essentially, more nature in her life, but could not bear to forfeit city life. That's when Seattle came into play, giving her the perfect balance. Instinctively, she was drawn to the region's unrivaled physical beauty, strong economy, and culture of healthy living. And she isn't the only one.

For decades, employers and employees alike have been drawn to the unparalleled quality of life we enjoy in the Pacific Northwest, largely due to the beauty and uniqueness of the natural environment that still surrounds us. However, *the enormous pressures of a booming economy and corresponding population growth threaten the very qualities that make our region so attractive.*

This growth translates to approximately 7 individuals per hour locating to the central Puget Sound region. Over the next 25 years, we can expect more than 1 million additional residents to the central Puget Sound – the current populations of Everett, Seattle, Bremerton and Tacoma combined.

Safeguarding the Puget Sound region's natural beauty and unique landscape is essential. As our communities continue to grow, we must stop and ask ourselves: what steps are we taking now to preserve and enhance clean water, productive farmland, healthy forests, public parks, salmon and wildlife, and other open space resources essential to our region? How and where will we accommodate the one million newcomers, and what impacts will that have on our region, our environment, and our quality of life for future generations?

We lack adequate answers to these questions. We already see our natural infrastructure being stretched to its limits because of development, and while there have been significant efforts to stem the tide, radically more needs to be done. In the past 50 years, the Puget Sound region has lost approximately 66 percent of its remaining old growth forest, over 90 percent of its native prairies, and approximately 80 percent of its marshes. These troubling statistics have prompted some to say we could lose our last acre of farmland in the next 30 years. As these natural resource lands are lost, we are exposed to growing risk of floods, landslides, droughts, and water shortages.

These are big, seminal challenges affecting our entire region that must be addressed partially, but very significantly, by the preservation, restoration and enhancement of our collective open spaces, both developed and natural. While there have been some notable successes, we continue to lack a comprehensive, coordinated, planned, prioritized, and regionally funded open space system. And it is critical that an open space vision and institutional collaboration address the regional scale, because ecosystems and green infrastructure networks depend on regional landscapes.

This report lays out a strategy for what we in the Puget Sound region must do to confront this challenge: balance enormous expected future population growth with protecting the natural assets our thriving communities depend on. While we may not all agree on the specifics of these recommendations, **it is clear there is an urgent need to better coordinate our efforts and be more efficient with our dollars. We must protect the natural infrastructure that uniquely defines our region, or through inaction - lose it forever.**

In the Pacific Northwest we pride ourselves on our resourcefulness and optimism. We are fortunate to be as rich in skilled, dedicated human resources as we are in natural resources. As such, we embrace the challenges before us with optimism, and confidence in our ability to succeed by working together.

A handwritten signature in black ink that reads 'Nancy Rottle'. The script is fluid and cursive.

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Regional Open Space Strategy for Central Puget Sound

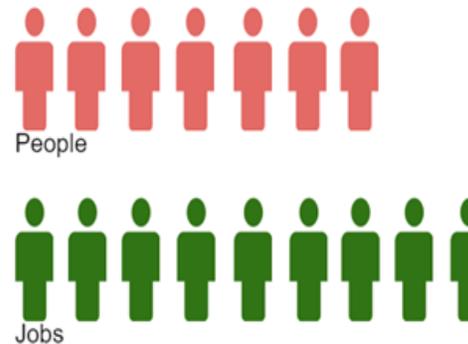
Executive Summary

The Challenge

Residents of the Puget Sound region treasure the area's environmental health, beauty, and recreational opportunities. Likewise employers and employees alike are drawn to the unparalleled quality of life enjoyed in our region. **These assets are not luxuries, they are essential life-sustaining assets.** Current and predicted future growth translates to approximately seven individuals per hour moving to the King, Pierce, Snohomish or Kitsap County areas, and almost nine newly created jobs per hour. Over the next 25 years, 1 million more residents are expected in the region – the current populations of Everett, Seattle, Bremerton and Tacoma combined. This expansion is a testament to the economic and environmental vitality of the region and its thriving communities. Yet, rapid growth can put tremendous strain on the same natural infrastructure that supports our way of life and makes the Puget Sound region so attractive.

Current growth in population and jobs per hour in the central Puget Sound region. *Source: PSRC, 2016*

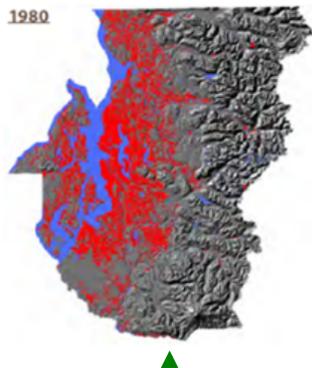
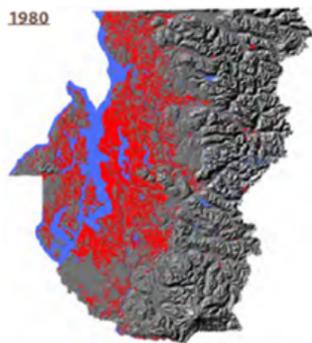
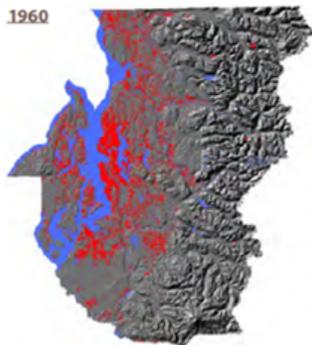
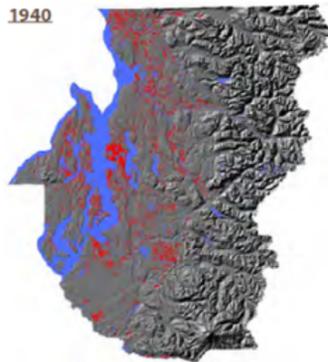
Growth per Hour



As development pressure stretches our natural infrastructure to its limits, the importance of safeguarding Puget Sound's open space resources and its benefits becomes more clear. Our rapidly growing population has resulted in segments of our communities without easy access to fresh food, parks, and trails and more vulnerable to the impacts of climate change. Limited access to open space deprives us all of the health benefits gained from opportunities to interact with nature. **The need to address the loss of open space resources is urgent.**

Since 1950, 60 percent of all farmland in the Puget Sound has been lost. Statewide we annually continue to lose 23,700 acres

Growth of the Region's Footprint



Growth of the Region's Footprint

Source: Urban Ecology Lab, University of Washington

of agricultural lands which have caused some to estimate that “the last acre of farmland in the region could be bulldozed or paved over by 2053” (Canty et al., 2012). The increasing land area lost to development degrades fisheries and aquatic habitat, increases risk of floods and landslides, and reduces our capacity to adapt to or mitigate against these natural disasters. These impacts are compounded by climate change, which aggravates drought conditions and wildfires in the summer, flooding and landslides in the winter. **While existing efforts to address these losses are meritorious, they are not sufficient.**

These challenges demand inclusive and comprehensive solutions. Yet our collective efforts to protect open space are disjointed, uncoordinated and – most importantly – inadequately funded.

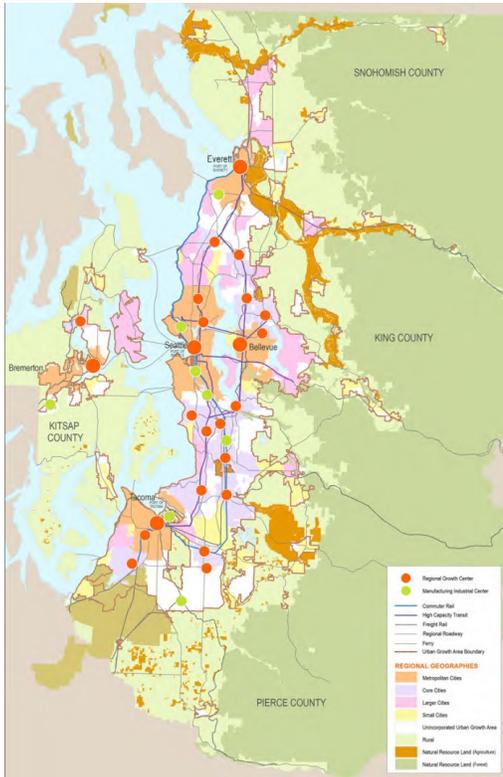
Over the last five years, the University of Washington’s Green Futures Lab has led the Regional Open Space Strategy (ROSS) – a collaborative research and planning initiative for the central Puget Sound region conducted with a broad network of open space experts. The ROSS undertook a cross-disciplinary, multi-pronged approach aimed at:

1. Creating a preliminary vision for a multi-jurisdictional and multi-objective regional open space system;
2. Improving regional coordination and decision-making on open space issues;
3. Building a regional open space advocacy community; and
4. Developing frameworks and tools to help advance the most important projects and actions.

Key Findings

In order to address the four objectives identified above, the ROSS team aimed to discover the issues related to the lack of an integrated open space system in this region renowned for innovative planning and sound environmental principles. Key findings are summarized below and are described in more detail along with others in Chapter 2.

Confronting Regional Challenges Requires Regional Planning and Action. The defining issues of our time: climate change, human health, social equity, economic development, and biodiversity are challenges that need to be addressed in part through a healthy, connected open space system. This system needs to be regional in scale, connecting land use with



▲
Regional Growth Strategy,
Vision 2040. Source: PSRC,
2009

environmental planning. A series of ROSS task forces, comprised of regional experts, identified how a robust regional open space system would directly help to address these challenges. This work takes the form of five Open Space Overview Reports which are located within Appendix D.

The Region Lacks a Coordinated Vision for Protecting Open Space. Despite significant efforts made to protect open space resources, the region lacks a unifying vision of how to connect and leverage that energy at the regional level. Work tends to focus on a particular jurisdiction, project area or on a specific issue, and is often driven by opportunistic considerations rather than a carefully constructed set of regional priorities. This “silos” or compartmentalizes efforts and funding, hampering the ability to maximize scarce dollars, achieve multiple benefits for people and the environment, and attract additional funding. An initial effort to sketch a regional vision is represented in Chapter 4, and in a video that can be accessed at: <https://youtu.be/r19XEnZk0Wo>.

Conservation Funding Is Inadequate and Fragmented.

Funding for conservation and restoration efforts are vastly under-sourced and regrettably unsystematic, originating from over 50 federal and dozens of state agencies and programs. Grants are made available on varying schedules, typically with a single purpose and seldom coordinated to produce multiple benefits. The nearly 500 municipalities and taxing authorities, and the hundreds of non-profit and volunteer organizations often compete to obtain these limited funds. Organizations attempting to initiate or continue projects spend time, money, and resources applying for these numerous grant opportunities when they could be focused on executing projects and engaging a larger public. This results in diminishing returns on investments that are already inadequate.

Open Space Protections Are Imbalanced and Not Suitably Scaled. The regional growth strategy, documented in VISION 2040 by the Puget Sound Regional Council (PSRC)¹, has done a remarkable job of maintaining density in the urban areas and stemming growth outside of urban growth boundaries at a regional scale.

However, undeveloped lands both inside and outside the

¹ The PSRC is a governmental entity composed of representatives from Pierce, Kitsap, King and Snohomish Counties, its cities, and other governments that develops policies and plans and makes decisions on regional issues. Under the U.S. Department of Transportation, PSRC is also the Metropolitan Planning Organization responsible for regional transportation planning and implementation.



▲ The four counties and eight watersheds of the Central Puget Sound Region.



▲ Annual contribution of open space to the regional economy.

Source: Earth Economics, 2015.

urban growth boundaries are not systematically protected or conserved as connected open spaces to serve both rural and urban populations at local or regional scales. The time has come to refine the details of that vision to ensure open spaces are connected, protected and enhanced to maximize their benefits and are not neglected in either our local planning or in our regional planning efforts. Often local governments do not have the resources to prioritize open space for conservation because of other demands. They may need assistance, and where there is regional benefit, regional support could make those connections. The conservation of open spaces such as working forest and farm lands, greenbelts, and trails in both rural and urban areas is a method of connecting us to nature, but it is also a means to retain diverse life styles and economies, promote public health, reduce the risks of climate change impacts and improve habitat that increases biodiversity.

Watershed-scale Planning Is Critical. Environmental systems are best analyzed within a watershed framework, rather than within municipal boundaries. Each watershed planning group must be empowered to design its own process for developing an open space plan with local priorities, guided by a regional framework. The existing Watershed Resource Inventory Area (WRIA) salmon recovery plans are already excellent foundations. As the WRIs update their recovery plans, an expansion of focus to incorporate the expanded PSP vital signs of healthy human populations and quality of life would benefit both people and fish. These planning efforts which specify restoration and protection priorities must be better coordinated with local governments, and those local governments need to understand and coordinate salmon recovery planning with other municipal priorities. To serve as examples, the ROSS process initiated and accelerated planning efforts in three watersheds: The Puyallup White (WRIA 10), the Green-Duwamish (WRIA 9), and the Snohomish (WRIA 7) Watersheds. These reports will be discussed in more detail within Chapter 5, and the full reports are located in Appendices H-J.

The True Value of Nature Goes Unrecognized. Our economic and natural resource decision-making models fail to capture the true value of open space as natural infrastructure. Accounting for the role that nature, and nature-based systems, play in civic infrastructure is essential for making informed decisions. Our regional green infrastructure system has been valued at more than \$300 billion, annually contributing \$11 to \$25 billion in services to the regional

At the Puget Sound Regional Council (PSRC), central Puget Sound counties (King, Pierce, Snohomish and Kitsap), cities and towns, ports, tribes, transit agencies, and the state work together to develop policies and make decisions about regional issues. Its mission is to ensure a thriving central Puget Sound now and into the future through planning for regional transportation, growth management and economic development.

Source: <http://www.psrc.org/about/>

economy. Because these are not just optional services but essential services, such as keeping our air and water clean, when these assets and their services are lost, they need to be replaced. Replacing these services with grey infrastructure solutions is generally much more costly (Earth Economics, 2015). We need to ensure that the true value of these natural assets and services are incorporated into our regional decision-making.

Recommended Strategy: Five Key Actions

In response to the findings above, the ROSS recommends five actions that, together provide a powerful framework for accelerating and expanding the region's conservation goals:

Create a Dynamic Regional Vision. The central Puget Sound region must develop a forward-looking regional vision that integrates the strategy for population growth with ongoing conservation and restoration efforts. This new vision must advance progress on climate resilience, biodiversity conservation, enhancing human health, accelerating social justice, and continued economic development. As a blueprint for action, this new regional vision needs to be geographically, and graphically, represented as an open space system map that provides clear direction on regional priorities for conservation investment. As the Metropolitan Planning Organization, the Puget Sound Regional Council (PSRC) regularly convenes regional decision makers for dialogue and action on plans for our growing region and is well positioned to coordinate this type of effort. PSRC should be resourced to better articulate and integrate these concepts into its regional planning process, consistent with the goals and objectives established by the Puget Sound Partnership (PSP), the state agency leading the larger region's collective effort to restore and protect Puget Sound. And, similar in scale and detail to the regional transportation plan and map, PSRC needs to coordinate the development of a geographically-based, prioritized, regional open space plan and map as identified in VISION 2040.

Establish an Integrating Regional Planning Structure. The region needs to identify a single agency with regional reach to guide and coordinate open space activities across the four counties. This needs to be accomplished at multiple scales: regional, watershed, outside and inside Urban Growth Areas (UGAs). The tiered system of Growth Management Act (GMA)

The Puget Sound Partnership is the state agency leading the region's collective effort to restore and protect Puget Sound. The Puget Sound Partnership brings together hundreds of partners to mobilize partner action around a common agenda, advance Sound investments, and advance priority actions by supporting partners. Their mission is to accelerate the collective effort to recover and sustain the Puget Sound.

Source: <http://www.psp.wa.gov/puget-sound-partnership.php>



▲
A few of the many organizations involved in promoting open space in the central Puget Sound region.

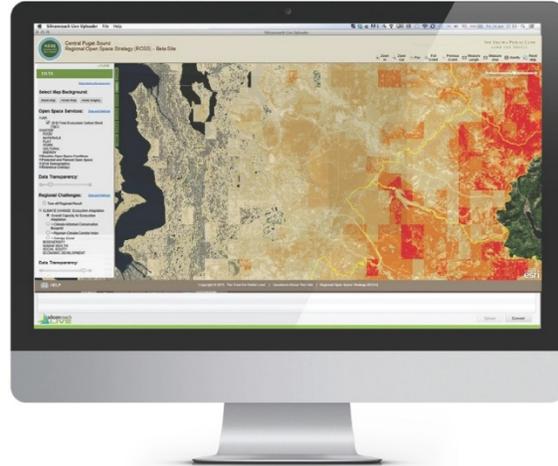
planning from regional to countywide to local, ideally positions PSRC to be that agency. If given the resources, PSRC could guide and coordinate open space activities across the four counties, much as they do for transportation and land use. There is no other regional entity suited to provide this needed regional leadership and coordination. Integrating environmental priorities with land use and transportation will be key to improving the effectiveness of our planning processes. Such a comprehensive planning framework would result in multiple benefits and efficiencies at all scales of the regional landscape.

Expand and Streamline Funding. The region needs a new framework for achieving consistency and coordination in the use of limited resources for open space work. The framework needs to align with the priorities identified in the vision, reducing the administrative burden on organizations currently competing for resources. Regional leaders should encourage a new system for coordinating federal and state dollars into as few categories as possible (e.g., acquisition, conservation planning, restoration, education/outreach) to be distributed by as few entities as possible. The entity(ies) should be given the flexibility to focus long-term funding on prioritized programs, projects, and activities that serve multiple benefits at multiple scales. This would allow staff and volunteer hours currently devoted to grant applications to be focused on direct services benefiting open space resources. Instead of creating a new entity, one option would be to have more funding managed by a state agency such as the Recreation and Conservation Office. Another would be to activate the non-profit foundation allowed under the Puget Sound Partnership. The region could work to promote this non-profit foundation as a hub to expand funding through authorizations, grants, and donations.

Advance Supportive Tools. The region’s policymakers need improved analytical and implementation tools for evaluating and monitoring land use options according to various criteria, such as carbon storage capacity, flood hazard reduction, and human health. They also need a way to more accurately evaluate open space project costs and to assess their full benefits. To be effective, such tools will require an expanded regional database of environmental and natural resource information, which needs to be augmented with additional research. These tools will help prioritize projects based on the full range of benefits a particular scheme might provide. Some of this work is already underway. The Trust for Public Land (TPL), as a member of the ROSS team, is developing a web-

based Open Space Benefits Assessment Tool, which will provide quantification of the values of our natural capital within the context of the regional challenges before us, allowing policymakers to better understand tradeoffs among various options and to simultaneously address multiple policy goals. See Chapters 3 and 5 for more details on this tool.

Snapshot of online ROSS
prototype portal of Open Space
Benefits Assessment Tool



Want to learn more?

The full Regional Open Space Strategy, as well as numerous other ROSS reports, are available in electronic format on the ROSS website:

www.openspacepugetsound.org

Convene a Collaborative Alliance. The region would be well served by the creation of a new umbrella organization that provides a powerful forum for collaboration and action to advance common open space goals. The Pacific Northwest is home to an extensive network of Tribal nations, non-profit organizations, government agencies, experts, business leaders, advocates, and other stakeholders with a vested interest in open space protection. These organizations have accomplished much in preserving the assets we enjoy today, largely independently. A new umbrella organization would improve coordination among these entities, surface opportunities for cross-sector partnerships, encourage resource-sharing and position the region for greatly enhancing conservation investments. Such an alliance would furnish the region with a consolidated voice of advocacy; critical, ongoing input on proposals that affect conservation efforts; a platform to educate constituents on the cross-disciplinary benefits of open space; and outreach to all who benefit from open space to continue to support conservation efforts and to take advantage of open space opportunities.



A REGIONAL OPEN SPACE STRATEGY

For the Central Puget Sound Region

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Report and Brochure
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- I. Green-Duwamish Stakeholder Involvement and Background Data**
- J. Snohomish Watershed Open Space Strategy**
- K. Regional Government and Finance Report**
- L. Open Space Services Assessment Tool**
- M. Videos and Flyover: Regional Open Space Strategy for Central Puget Sound**

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contained in Appendix D

(Addressing Regional

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(Snohomish WOSS); and

Appendix K (Government and

Finance)

ACRONYM LIST

APS	American Physical Society
ARL	Agricultural Resource Lands
CO ₂	Carbon Dioxide
CPP	Countywide Planning Policy
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
EIA	United States Energy Information Administration
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Administration
GIS	Geographic Information System
GMA	Growth Management Act
HUD	Housing and Urban Development
lbs	Pounds
MPO	Metropolitan Planning Organization
MPP	Multicounty Planning Policy
MRSC	Municipal Research & Services Center
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFM	Office of Financial Management
OSU	Oregon State University
PCBA	Pierce County Biodiversity Alliance
PCRC	Pierce County Regional Council
PDR	Purchase of Development Rights
PSCOG	Puget Sound Council of Governments
PSP	Puget Sound Partnership
PSRC	Puget Sound Regional Council
PSRPC	Puget Sound Regional Planning Council
RCW	Revised Code of Washington
ROI	Return on Investment
ROSS	Regional Open Space Strategy
RTPO	Regional Transportation Planning Organization

TDR	Transfer of Development Rights
TPCHD	Tacoma-Pierce County Health Department
UGA	Urban Growth Area
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
WAC	Washington Administrative Code
WAGDA	Washington State Geospatial Data Archive
WOSS	Watershed Open Space Strategy
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation



**Weaving Together
Watershed Priorities**



A REGIONAL OPEN SPACE STRATEGY FOR THE CENTRAL PUGET SOUND REGION

"The ROSS represents a real opportunity to develop a national model for doing conservation right at the regional scale"

- Ron Sims, former Deputy Director of H.U.D.





Chapter 1

Introduction

CHAPTER 1: INTRODUCTION

Overview



What is the ROSS?

The Regional Open Space Strategy (ROSS) project has been working to identify strategies to conserve and enhance the natural infrastructure of open space systems within the four-county region of Kitsap, Pierce, King and Snohomish Counties.

With leadership at the University of Washington, and an esteemed regionally-representative Executive Committee, the ROSS has facilitated an alliance between a broad spectrum of agencies, nonprofits, and private organizations with the goal of achieving an integrated set of priorities and tools for regional open space planning and stewardship in the central Puget Sound region.

Refer to Acknowledgements page xvi for list of Executive Committee members.

The Puget Sound region enjoys and relies upon world-class open space that provides food, timber, energy and clean air and water; helps keep us healthy; and enhances our ability to withstand disasters. Parks, trails, beaches, farm and forest lands, scenic views and wilderness areas support an unparalleled quality of life for those that call the region home.

This natural wealth has helped make the central Puget Sound region one of the fastest growing places in the country, attracting businesses and allowing them to retain and recruit employees.

Yet with seven people arriving per hour, many of these natural assets are being stretched to the breaking point. Intense population growth and associated development pressure is coming at a high cost.

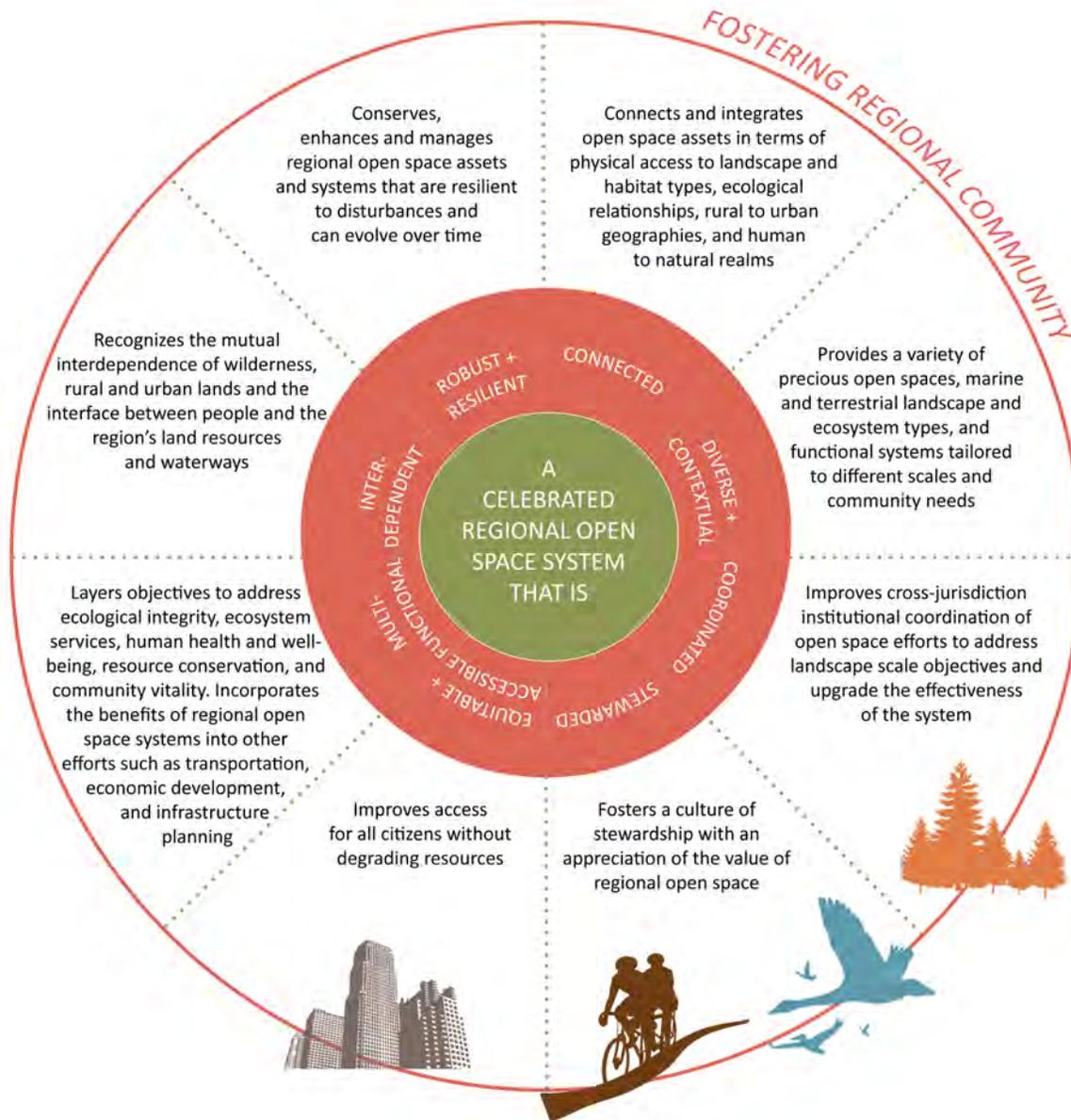
Securing the long-term viability of our natural assets is critical to maintaining the economic, ecological and cultural vitality our region is known for. And while the work of countless individuals and organizations over the past half century has created a legacy of conservation, there is much more to be done. The current structure of open space planning and implementation is underfunded and uncoordinated. Effectiveness and efficiency at conserving and enhancing our open space systems could be greatly improved by **strengthening connections, integrating efforts, and directing resources to the most critical priorities.**

The Regional Open Space Strategy (ROSS) is an effort to conserve and enhance the natural assets within the four-county central Puget Sound region. The ROSS envisions an **integrated regional open space system**, celebrated and stewarded by current and future generations, that enhances the ecological, economic, and social vitality of the region.

Region-wide integration is at the heart of ROSS goals. This effort provides a framework for planning at various scales, guidance for sustainable long-term stewardship, and tools to support the work. To best serve our communities, our open space systems must be viable at the regional level. Our farming and forestry economies, our recreational trails, and especially our natural infrastructure systems all function at the regional, inter-jurisdictional scale. These larger systems provide multiple benefits and services.

Vision and Values of a regional system that weaves together a connected system of open spaces and fosters effective collaboration among the many activities underway.

Source: ROSS Preliminary Comprehensive Strategy



ROSS's 16 open space service categories adapted from the Millennium Ecosystem Assessment Report. See Chapter 5



What Is Open Space?

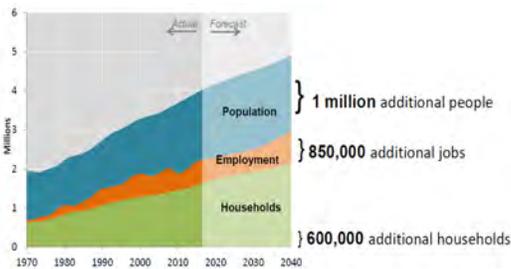
It's not just about parks. Open space is an expansive term that includes a wide spectrum of lands both public and private, rural and urban, large and small that together create the natural infrastructure on which society has always depended. Open spaces can be public parks, local and regional trail systems, wetlands and surface water bodies, wilderness lands, urban green spaces like parkways, rain gardens and green roofs, and resource lands for agricultural and timber production.

Open spaces support our communities in ways easily taken for granted: cleansing air and water, minimizing damage from floods, sequestering or capturing carbon, and providing habitat for wildlife. Access to open space for recreation reduces obesity and stress levels.

These open space services, once lost, are costly or impossible to replace with traditional engineered (grey) infrastructure. The movement to set back levees to improve flood management (green infrastructure) is a case in point. We are now finding that the natural floodplain can provide equivalent flood control benefits at less cost than engineered levees, while also providing a range of other environmental and socio-economic benefits.

The Challenge

Intense population growth is changing how we use the land. In the past 150 years, the Puget Sound region has lost approximately 66 percent of its remaining old growth forest, over 90 percent of its native prairies, and approximately 80 percent of its marshes to development (PSP, 2015). Since 1950, 60 percent of all farmland in the Puget Sound has undergone conversion, and Washington state continues to lose 23,700 acres of agricultural lands every year (Canty et al., 2012, 6; Cascade Land Conservancy, 2009).



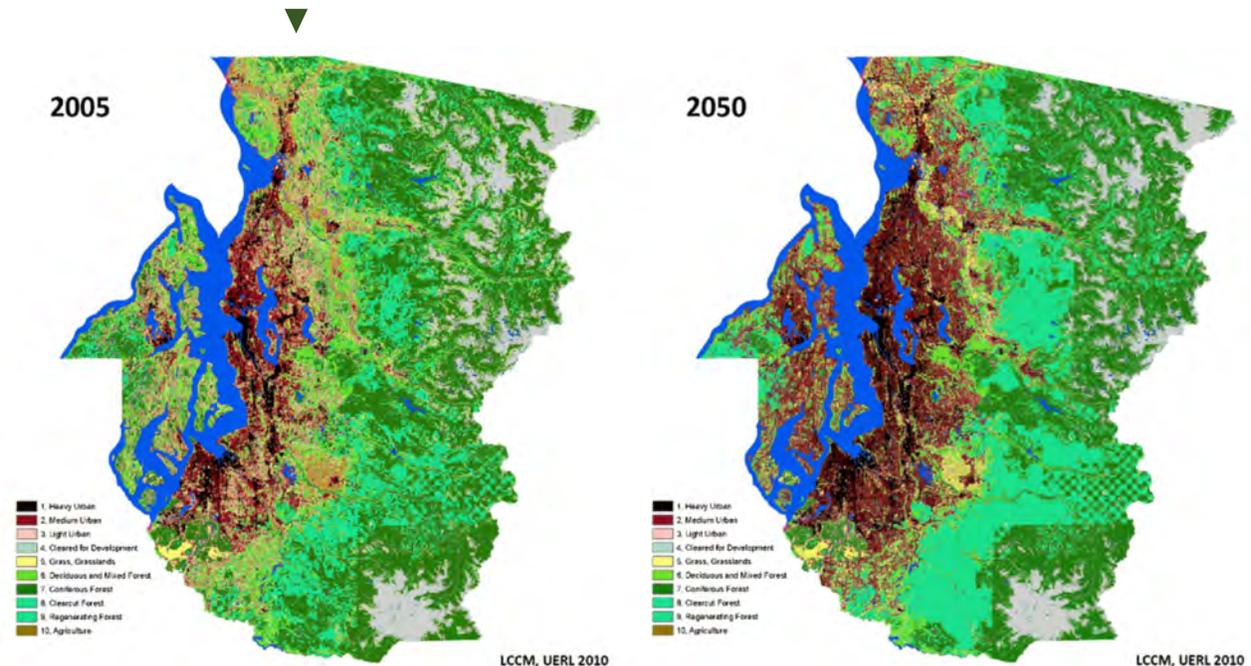
Expected growth in the Puget Sound region.

Source: PSRC, 2016.

These losses affect our communities in myriad ways: increased flood risk; declining air and water quality; loss of wildlife; and added strain on already aging infrastructure. As these systems erode, so will the region's reputation for natural wealth, compromising economic opportunities, which are already deficient for many individuals in our region.

In order to adequately preserve and enhance the region's open spaces, we must understand what they do – and the consequences of losing them. The ROSS identified five challenges which, collectively, reflect the impact of the loss of our open space, and also identified the benefits of protecting them.

Expected urban land cover change in the central Puget Sound region. *Source:* Urban Ecology and Research Lab, University of Washington



The Role of Open Space in Confronting Regional Challenges

When recognized as a solution, open space becomes an opportunity to integrate numerous, seemingly divergent needs under a common agenda to confront some of our primary challenges. Specifically open space can help to:

- 1) Adapt to and mitigate against **climate change**;
- 2) Advance **social equity**;
- 3) Preserve **biodiversity**;
- 4) Improve **human health**; and
- 5) Enhance **economic development** opportunities.

These regional challenges represent opportunity areas where open space plays an essential role. The objective in examining open spaces through these regional filters is to illustrate the overall importance of open space in the health and continued success of the region. The potential for open space to address these five challenges is summarized below, with full papers contained in Appendix D.

Climate Change: Open space plays a huge role in both climate change mitigation and adaptation. Open spaces, and the vegetation within them, are some of the most effective and

efficient agents for storing carbon dioxide (CO₂) to help mitigate the effects of climate change. However, central Puget Sound urbanizing open spaces are being converted to developed land uses at staggering rates.

Land conversion since 1966 in Central Puget Sound



Open Space Type	Total Acres		Difference
	1966	2012*	
Forests <i>(including timberlands, national and state forests, and national and state parks)</i>	2,337,210	2,407,466	70,256
Urbanized Open Spaces	1,497,750	106,538	(1,391,212)
Agriculture	447,000	177,133	(269,867)

*Most recent data available. Forest acres and urbanized open spaces are from 2011 land cover data (Ecology, 2014) and the agriculture acres are from the Census of Agriculture (USDA, 2014)

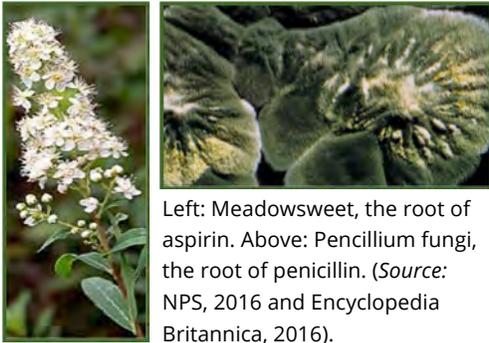
Even if massive revegetation efforts were to start today, the CO₂ already accumulated in the atmosphere creates a lag effect, and the impacts of climate change will continue to be felt: hotter summers, drought, bigger storms and wetter winters. Here too, open spaces can be of service in terms of helping the region adapt by retaining floodwater, filtering air and water of pollutants, reducing the urban heat island effect and decreasing temperatures of both surface and ground water (Phillips, 2014). (See also Appendix D 2, Gregg, et.al., 2015.)

Biodiversity: The central Puget Sound region is home to a great number of plants and animals. This biodiversity is allowed to flourish because of the open spaces that provide habitat for plants and where associated creatures can travel, sleep, hunt, and forage (Carrara et al. 2014). The richness and long-term health of our regional biodiversity depends both on the amount and quality of open space, and its spatial structure and configuration. The changes in the landscape over the last 200 years have resulted in significant declines for many of Washington’s native species, both aquatic and terrestrial. Forty animal and fish species and 10 plant species are near extinction. Various state and federal agencies maintain lists of species that are of conservation concern; all of these lists continue to grow as landscape changes overshadow conservation efforts (WA Biodiversity Council 2007). (See also Appendix D3, Koontz, et.al, 2015)

Social Equity: Community parks and larger open spaces provide residents and visitors with opportunities to participate in a wide variety of outdoor activities; improve health of individuals; foster environmental education; and promote communal and social

The Importance of Biodiversity

In the central Puget Sound region it is increasingly important to conserve open space to maintain biodiversity across and within the entire urban to rural landscape in order to preserve genetic diversity. This is crucial for the maintenance of cultural heritage; preservation of ecosystem and economic health; and for the creation of new life saving medicine. For instance, 40 percent of prescribed medications have been derived from plants, animals or, micro-organisms (Chauhan and Varma, 2006).



Left: Meadowsweet, the root of aspirin. Above: Pencillium fungi, the root of penicillin. (Source: NPS, 2016 and Encyclopedia Britannica, 2016).

There has also been a significant rise in the body of research showing how important access to any contact with nature is to our health and happiness. We know that we need that connection, that contact with nature, not just during an occasional holiday or summer vacation, but we need it daily or hourly.

-Timothy Beatley, 2016)

activities. Social equity can be advanced when individuals have equal access to quality open spaces. Unfortunately studies have shown that, in comparison to the general population, low income populations and communities of color have less access to green space, lower quality and less culturally-relevant recreational options, and higher rates of poor health and obesity that can be linked to lack of open space opportunities (Active Living 2011). In addition, minority populations may have limited voice and power in planning and decision-making processes, thus perpetuating disparities in access and quality of experiences tied to open space. People of color currently make up over 30% of the region's population and are growing in number. In order to ensure our regional prosperity can be shared by all, it is increasingly important to engage residents that have traditionally been left behind in open space planning decisions. (See also Appendix D4, Childers and Gelb, 2015.)

Human Health: Having access to open spaces for recreation and aesthetic enjoyment supports physical and mental well-being. Open spaces also filter air, water and soil contaminants, and produce healthy food, shelter and jobs (TPCHD, 2015). This is especially significant from a public health standpoint since non-communicable diseases (such as cardiovascular, diabetes, and respiratory diseases) have surpassed infectious diseases as the leading cause of illness and death. Experts anticipate that by 2020 mental and substance abuse disorders will surpass physical diseases as a major cause of disability worldwide (Hyde, 2011). Evidence suggests that outdoor exercise and spending time in nature and open spaces can improve mental health and help fight disease. Research is on-going to help understand the types of open space elements that might improve specific health outcomes. (See also Appendix D5, Andrews and Wolf, 2015.)

Economic Development: Open space investments have a direct role in supporting many of the industries within the central Puget Sound region including farming, timber and tourism. At 18.5% of total employment, tourism ranks as the third largest employment cluster and the 4th fastest growing cluster in the region. On whole, tourists contribute \$4.6 billion to Washington's economy, with nearly 80 percent of the state's revenue from tourism occurring in the Puget Sound region (OFM, 2007).

Conserving open space is also critical to the region's economic success and potential for creating new industries in resource management, natural science and human health research. Open spaces also play a less direct, but no less important, part in the region's economic health by attracting (and helping retain) world class businesses and talent (Prosperity Partnership, 2012, 8). (See also Appendix D6, Raker and Masterson, 2016.)



▲ Open spaces, such as pumpkin patches, are big draws for local tourism in the central Puget Sound region, as well as opportunities for recreation and environmental education.

For open space conservation to most effectively advance public policy goals, a region-wide approach is critical. Solutions must be coordinated comprehensively at the inter-jurisdictional level to ensure that the benefits of our many conservation activities can be leveraged to their fullest potential.

Want to learn more?

More details can be found in overview papers on each regional challenge at <http://regionalopenspacestrategy.org/ross-reports>.

The ROSS Preliminary Comprehensive Strategy (PCS)



▲ Sammamish Water Trail. Healthy river corridors are a central ingredient in a robust open space network.

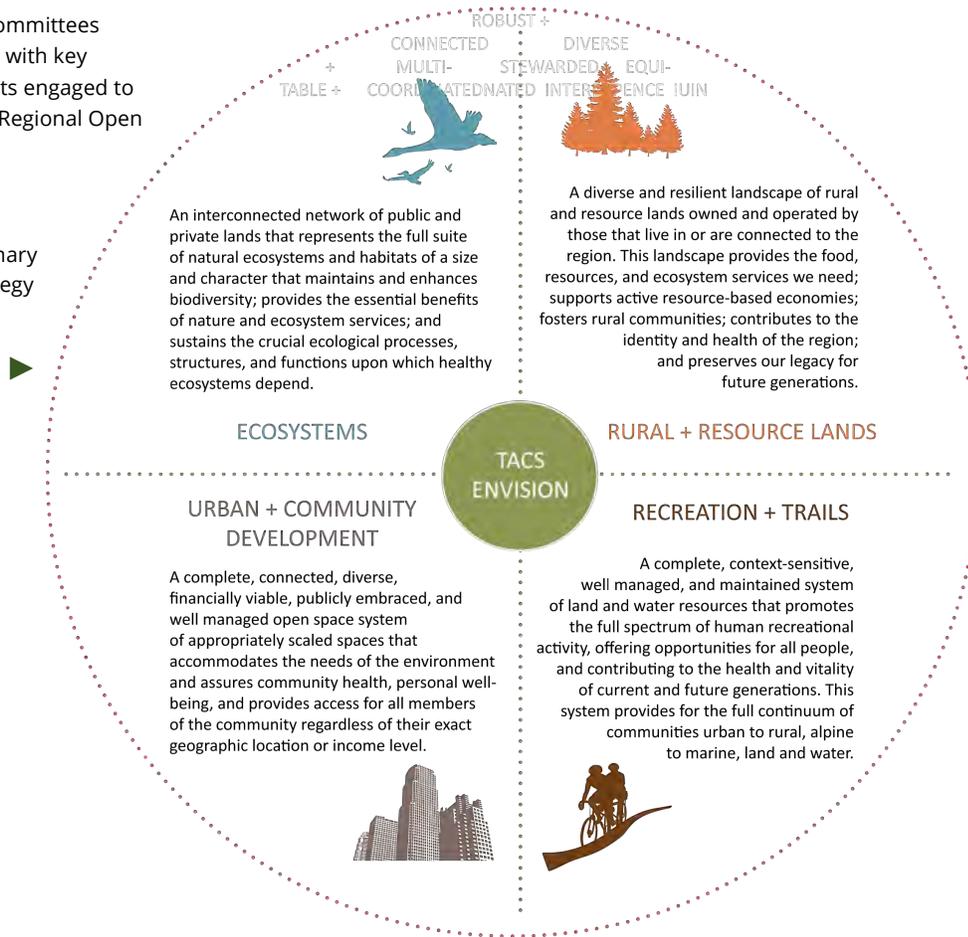
Much of the current momentum for a regional focus on open space can be found within the Puget Sound Regional Council's (PSRC) Vision 2040. Policies calling for the development of a regional open space strategy were developed as part of that document in 2008. This Regional Open Space Strategy aims to create momentum toward addressing these VISION 2040 goals.

In 2012, the ROSS engaged over 100 regional leaders and experts to create a Preliminary Comprehensive Strategy, which outlined the principles and goals of a regional open space system and a work plan towards the final strategy. The preliminary ROSS goals were to:

- Build a regional open space system;
- Advance the most important projects and actions;
- Improve regional coordination;
- Expand analytical tools; and
- Build a regional open space advocacy community

Technical Advisory Committees comprised of leaders with key expertise and interests engaged to form a vision for the Regional Open Space system.

Source: ROSS Preliminary Comprehensive Strategy



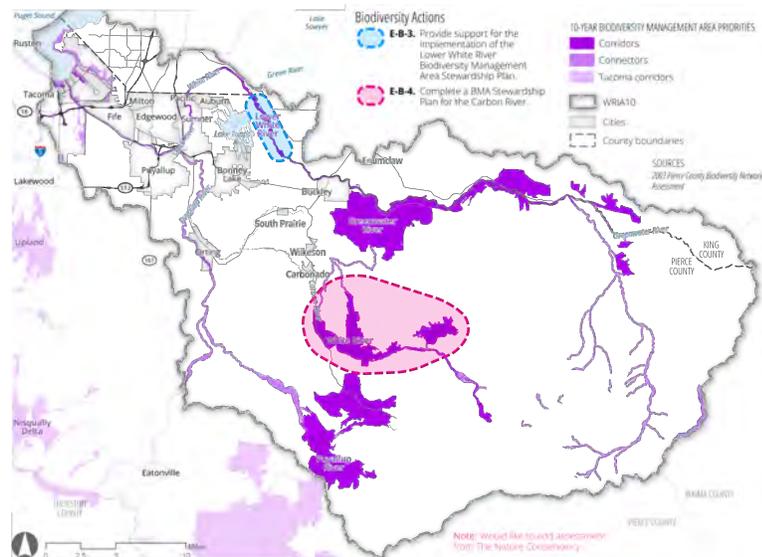
First, a scoping process was initiated to identify the need, inter-organizational collaboration, technical methods, time and resources necessary to complete the ROSS. An Executive Committee was formed to guide the overall project. Four Technical Advisory Committees (TACs) were convened to focus on: Ecosystems, Rural and Resource Lands, Urban and Community Development, and Recreation and Trails. The leadership of these committees was essential in creating a shared vision, goals, and potential actions. The PCS can be found in Appendix C.

Implementing the PCS

To address the first tasks of the PCS work plan, “build a regional open space system” and “advance the most important projects”, the ROSS began with the concept that it is important to build from the local level up to the regional level. But by local level, it was clear early on that to be most comprehensive, planning needed to be at a watershed scale, not necessarily at

the local government scale. Salmon recovery planning at the watershed scale in water resource inventory areas (WRIA) has already been conducted for years in the region. And, while more singly focused on habitat and water quality to protect the anadromous fishery, a good deal of information and collaboration has already been established. The ROSS engaged in open space planning at this watershed level for the Puyallup-White river basin, taking advantage of work and processes undertaken in WRIA 10 and working with newly formed “communities of interest” established through the The Russell Family Foundation’s Puyallup-White Watershed Initiative (discussed in more detail in Chapters 3 and 4).

Excerpt from the Puyallup-White Watershed Open Space Strategy



Related to the tasks of “improving regional coordination” and “building a regional community”, over its five years of effort the ROSS continued to convene the Executive Committee to promote conversations toward increasing collaboration and to solicit feedback on work products. Subgroups of the Committee with other pertinent stakeholders were brought together for development of both technical and strategy work products including for topics such as regional governance and finance and mobilizing non-governmental organizations (NGOs).

Concurrently, two major work efforts provided the foundation for subsequent work. Under “advance the most important projects and actions”, there was considerable discussion on what would constitute “important” which led to improved articulation of the major **regional challenges** that open space could affect, described earlier. And under “expand on analytical tools” a focus on ecosystem services as a means to measure and compare actions was taken with five overview papers



Example of a Forterra success on their 100 Year Cascade Land Agenda

written to explore the relationship of open space to regional challenges. Ecosystem services were redefined as **open space services** to be more specific to the role of open space in addressing the regional challenges, and this framework was used in developing an online tool to enable policymakers to assess diverse values of our regional open spaces. (See also Chapter 5.)

The Preliminary Comprehensive Strategy guided the development of three Watershed Open Space Strategies and ultimately the establishment of this integrated Regional Open Space Strategy to advance and coordinate regional-scale implementation mechanisms.

A Regional Open Space Strategy

This document contains the findings and recommended strategies from the five years of study and collaborative planning that are needed to effect a robust, responsive, integrated open space system. The electronic version of this document also contains the complete set of specific planning studies and tools developed during this initiative to support implementation and expansion of a Regional Open Space Strategy for the central Puget Sound region.

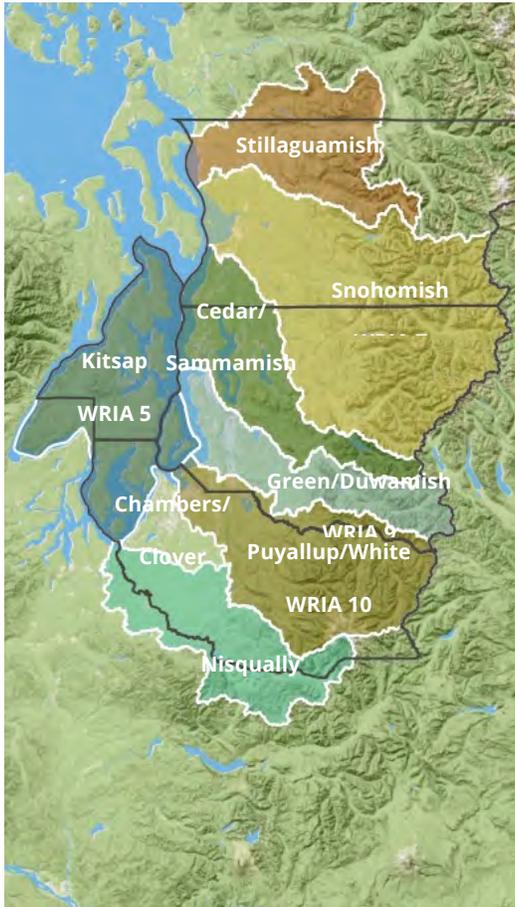




Chapter 2

Key Findings

CHAPTER 2: KEY FINDINGS



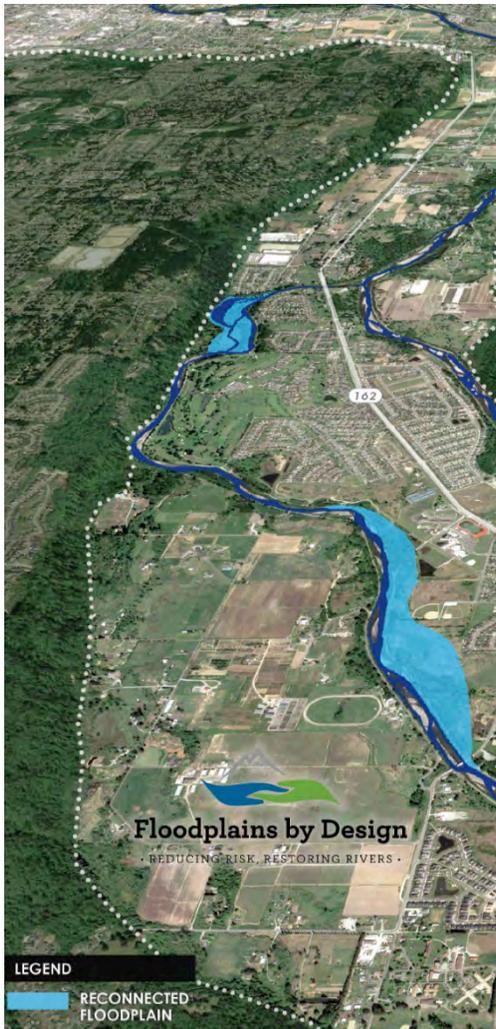
The eight watersheds within the four-county central Puget Sound region.

The Central Puget Sound region is comprised of eight major watersheds stretching from the crests of the Cascade Mountains to the shorelines of Puget Sound. Drawn by the region's unique natural amenities and thriving economy, the number of people living in the central Puget Sound area has been growing for decades. That growth continues to accelerate, severely straining the region's natural resources, threatening the environmental assets that have defined the region and fueled its economic growth and extraordinary quality of life. **These assets are not luxuries, they are essential life-sustaining assets.** While numerous efforts are aimed at protecting and restoring Puget Sound landscapes and waters, we continue to lose our natural infrastructure assets at alarming rates. **Existing efforts to address these losses are meritorious, but they are not sufficient.** Government and nonprofit initiatives have been inadequately resourced and not suitably coordinated to confront these major challenges at appropriate scales.

While conservation and enhancement of the region's landscapes can help to provide resilience to challenges such as climate change, loss of biodiversity, health and social inequities, and reduced economic development opportunities, current economic and natural resource policymaking processes fail to account for the full value of our natural assets, leaving open space investments consistently under-prioritized and chronically under-funded. **The need to address the loss of open space resources is urgent.**

These challenges cross political and geographic boundaries. The impacts of climate change, for instance, are not only felt in our rural areas but in our towns and cities as well. The solutions to these issues must be regional. To fully understand the range of benefits provided by open spaces, a comprehensive approach that examines the entire region and engages a broad set of constituents is essential. This chapter highlights the key findings of research conducted by the ROSS effort concerning the region's current open space planning efforts.

The following pages describe key findings concerning open space in the central Puget Sound region:



▲
Levee setbacks within the Puyallup River have reduced flood risks within the city of Orting and surrounding farmlands, and been effective at improving salmon habitat.

1. **Confronting regional challenges requires regional planning and action.** Regional planning of open space resources can provide a rich opportunity to confront five key challenges of our time: biodiversity, climate change, social equity, human health, and economic development. Making open space resource management decisions at a regional level would empower our response to these challenges.
2. **The region lacks a coordinated vision for protecting open space.** The lack of a unifying physical image inhibits the region's ability to identify where and what efforts should be prioritized conserved and enhanced.
3. **Open space protections are imbalanced.** Planning and management of open spaces differs across political boundaries and among different constituents. Lands both inside and outside urban growth areas are not protected or conserved with consideration for providing connected open spaces.
4. **Watershed-scale planning is critical.** The watershed is the most appropriate scale for analyzing natural processes. The extensive work of existing salmon recovery planning efforts can provide the foundation for regional planning.
5. **Conservation funding is inadequate and fragmented.** It results in duplicative administrative costs, competition and constrained opportunities for deeper collaboration and multi-objective initiatives that address more than one location specific challenge or problem at a time.
6. **The true value of nature goes unrecognized.** Our current system does not value the ecosystem services that open space provides as natural capital, and therefore fails to account for the benefits returned on investments to preserve and enhance them.
7. **Data services need to target decision making.** Baseline data is inconsistent across geographies; our research needs to better target information and metrics to understand how our efforts are performing; and we need tools that integrate land use with environmental system health to adequately inform decision making.
8. **Regional collaboration needs a boost.** The Puget Sound region is home to hundreds of public, private, and non-profit organizations employed in open space conservation whose efforts could be enhanced with a unified alliance to improve communication and coordination, and provide a consolidated voice of conservation advocacy.

1. Regional Challenges Need Regional Planning

“The general lack of legislative as well as full public support and/or recognition of parks as being ‘essential’ or reasonably ‘necessary’ has also inhibited county and municipal governments from assuming more comprehensive responsibilities in public recreational needs or in making substantial progress toward eliminating public park deficiencies.”

Source: PSRPC, 1966, 46

The defining issues of our time: climate change, human health, social equity, economic development, and biodiversity are regional challenges that cross political boundaries. They need to be addressed at the regional level. Because research confirms that our natural infrastructure can powerfully and economically address these challenges, making open space resource management decisions at a regional level would empower our response to these challenges. The ROSS Ecosystem Service Task Forces, comprised of regional experts, identified how a robust regional open space system would directly help to address these challenges. This work takes the form of five Regional Challenge and Open Space Reports, which are located within Appendix D.

Each of these issues is influenced by how we use the land. In the central Puget Sound region, planning is conducted under a tiered system consistent with the Growth Management Act (GMA), with regional planning in the central Puget Sound region conducted by the Puget Sound Regional Council (PSRC). The PSRC’s attention has mostly been aimed at land use of the built environment or where development has and should occur to accommodate growth. Multicounty Planning Policies (MPPs) developed by the Council guide the location of regional and industrial centers to a connected regional transportation system. The MPPs subsequently guide development of countywide planning policies, which then guide development of comprehensive plans of the cities and towns within each county. The comprehensive plans subsequently guide the land use regulations of local governments who have ultimate authority for how land is used. Under this system, regional planning is fundamental to integrating land use with transportation infrastructure, which also affects local land use planning and implementation. The PSRC currently has unrealized jurisdictional capacity to create MPPs that guide environmental and open space planning. These policies would be implemented at the local level, thereby applying open space conservation and enhancement to achieve both regional and local outcomes.

“PSRC’s mission is to ensure a thriving central Puget Sound now and into the future through planning for regional transportation, growth management and economic development.”

PSRC 2016(a), <http://www.psrc.org/about/>

The Puget Sound Partnership (PSP) is another regional agency, overseeing the recovery of Puget Sound, so has a larger geographic reach than PSRC. The agency focuses on facilitating water quality and habitat conservation, which are implicitly connected to how land in the Puget Sound area is used.

Open Space in Puget Sound: Unheeded Warnings

Open space is not a new concept and its protection is not a new idea. Even 100 years ago Seattle Park Commissioners enlisted the Olmsted Brothers to develop a comprehensive park plan to guide the City's future park system. The Olmsted plan became the foundation for some of the City's landmarks such as Golden Gardens, the Arboretum, and Seward Park to name a few. And 50 years ago, regional leaders saw a need to address the pressures of expansive growth.

In 1966, the Puget Sound Governmental Conference and Puget Sound Regional Planning Council (precursors to our current Puget Sound Regional Council) wrote *Project Open Space*. The authors believed that open spaces were essential for recreation, conservation of natural resources, and structuring urban development. The report also noted that open space in the Puget Sound region needed to increase by 15,000 acres in counties and 1,500 acres in urban areas to accommodate the existing recreational demand in 1966 (PSRPC, 1966, 45). It also predicted a larger deficit for the year 2000 if steps weren't taken to protect existing open space resources. At the time, the focus was on protecting open spaces for recreational opportunities, ecological balance, and cultural heritage.

"The general lack of legislative as well as full public support and/or recognition of parks as being 'essential' or reasonably 'necessary' has also inhibited county and municipal governments from assuming more comprehensive responsibilities in public recreational needs or in making substantial progress toward eliminating public park deficiencies" (PSRPC, 1966).

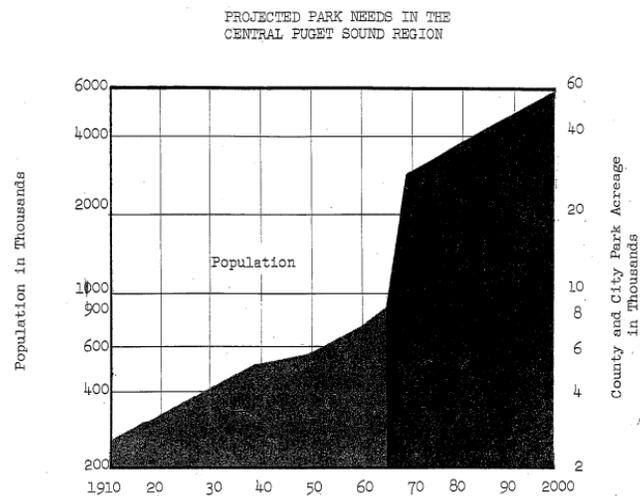
Since the publication of *Project Open Space*, open space protection efforts have remained sporadic and disjointed. As a region today we are living with the consequences of not having acted on the report's recommendations. Despite the authors' warnings, open spaces, and especially agricultural and forested lands, have continued to be converted to developed land uses at staggering rates.

However, the PSP has no regulatory authority over land use. It has relied on efforts developed by watershed forums and councils in a complex interjurisdictional process that concentrates on salmon habitat restoration projects but is expanding its reach with a broadening understanding that healthy human populations and quality of life are integral to the health of Puget Sound. That process is an outgrowth of the listing of Puget Sound Chinook salmon as threatened under the federal Endangered Species Act nearly 20 years ago.

The differences between land use planning and environmental planning can be considered subtle to some and substantial to others. Land use has traditionally focused on the built environment, where environmental planning has focused on the natural environment. These are arbitrary constructs created to segregate planning activities for purposes of specialization. Even with today's emphasis on sustainability where built and natural environments ought not to be separated, these arbitrary divisions are consequential due to the regulatory framework in which we operate and due to organizational structures we have created that hamper our progress toward integration. PSRC has had a land use orientation; PSP has had an environmental orientation. PSP's geographic reach is larger than the central Puget Sound region; PSRC's geographic reach is coincident with that of the ROSS study area. Of the existing regional agencies, the PSRC appears most suited to link land use with environmental planning, and it is clearly within their mission to address the regional challenges through open space planning.

2. The Lack of a Coordinated Vision

The idea for a region-wide open space plan began to take shape in 1966 with the Puget Sound Governmental Conference's¹ *Project Open Space*. The report's goal was to comprehensively study the open space networks within the region to determine future needs. It recommended treating open spaces like any other infrastructure system that needs an asset management system. The 1966 report helped start a conversation on the need for a regional green infrastructure system conserved through long-range regional planning (PSRPC, 1966).



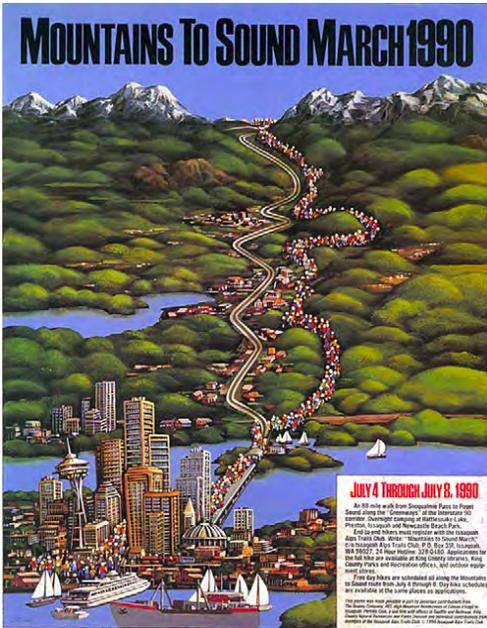
▲ Projected park needs from the 1966 report (PSRPC, 1966).

Fifty years later we are still trying to create a unifying and comprehensive vision for open space planning. The region has yet to successfully create an inventory of our existing assets, much less maintenance or expansion plans. The ROSS team has taken first steps towards the creation of an open space inventory, although identifying priority areas for conservation and enhancement is still a critical next step.²

The central Puget Sound region continues to need a forward-looking regional vision that integrates land use planning with conservation, enhancement and restoration efforts. Nearly every successful planning initiative has a physical image or plan that helps act as a rallying focus to stimulate action.

¹ Predecessor to the current PSRC, see discussion in Chapter 1.

² See Chapter 4 for the initial ROSS sketch regional strategy that highlights priority areas.



This 1990 poster advertised a 55-mile hike initiated to bring awareness to the Mountains to Sound Greenway concept in 1990. *Source:* Mountains to Sound Greenway Trust, 1990.

The term “greenlining” was used in the 1980s to identify areas, often privately owned and in productive use that needed to be protected and managed in order to retain their natural, scenic, or historic attributes (Corbett, 1983; Zube, 1995). The Mountains to Sound Greenway effort used greenlining to identify the concept of a trail that traversed from the Cascade Mountains to Puget Sound. The “flexible, fuzzy,” but physical greenline outlining the route was “effective for advocacy: because geography is tangible, identifiable, and immutable, it provides conceptual clarity, and elicits a level of passion needed to sustain successful greenway efforts” (Rottle, 2006).

While the 100-year vision of Forterra (formerly Cascade Land Conservancy) has fuzzier green lines associated with its Cascade Agenda, it nonetheless has a physical image on which to drape its goals of conserving 1.3 million acres of working forests, farmlands, shorelines, parks and natural areas and ensuring a park within ½ mile of every city resident. The Agenda’s geographic reach is the landscape of Snohomish King and Pierce Counties and also extends over the Cascade Mountains into Kittitas County.

PSRC has also identified the continued need for an open space vision, and began to outline its potential form within its VISION 2040 document. That document emphasizes environment and sustainability as a foundation for the regional growth strategy.

The VISION 2040 policy base could help the central Puget Sound region accelerate development of a regionally coordinated open space plan. This shared vision could help integrate land use, environmental, and transportation planning to a degree seldom seen at the regional scale if open space is more directly addressed as a central part of the solution. Such “a unifying vision of the ways those efforts interconnect at the regional level would be a valuable contribution to environmental management activities” (PSRC, 2009, 10). This vision would further help to prioritize funding and ensure that the quality of life that enticed many people to move here in the first place can be sustained into the future. With a vision in place it will also be possible to create a strategy to transition open space goals into reality. Without this vision or strategy the conversion of open spaces to developed uses will continue. In the last 150 years, the Puget Sound has lost “at least two-thirds of its remaining old growth forest, more than 90 percent of its native prairies, and 80 percent of its marshes” (PSP, 2015).

3. Open Space Protections Are Imbalanced and Uncoordinated

At PSRC, central Puget Sound counties (King, Pierce, Snohomish, and Kitsap), cities, towns, ports, tribes, transit agencies, and the state work together to develop policies and make decisions about regional issues. The full PSRC General Assembly includes all council and commission members from member jurisdictions. All members are eligible to vote on Assembly actions. See the PSRC webpage for more information:

<http://www.psrc.org/about/>

Vision 2040 is a regional strategy for accommodating the 5 million people expected to live in the central Puget Sound region by 2040. It is an integrated, long-range vision for maintaining a healthy region – promoting the well-being of people and communities, economic vitality, and a healthy environment. The concept of people, prosperity, and planet provides a central theme for VISION 2040. This concept signals that regional leaders use an approach that takes into account social, cultural, economic, and environmental benefits when making decisions.

Source: <http://www.psrc.org/growth/vision2040>

The regional growth strategy envisioned in PSRC’s VISION 2040 has made great strides at the macro level to focus growth in urban centers while protecting rural areas as mandated by the State’s Growth Management Act (GMA). As the Metropolitan Planning Organization, the PSRC regularly convenes regional policymakers for dialogue and action on regional growth strategies and particularly transportation issues. The transportation network connects urban centers, cities and towns compliant with federal requirements to obtain funding support. Although the PSRC evaluates municipal and county comprehensive plans for consistency with the growth strategy, there is no requirement to include open space considerations within these plans. While the PSRC is authorized to review and comment on the transportation element of comprehensive plans, review of other plan elements occurs only through voluntary agreements. Except for the efforts of individual local governments and their partners, open space and natural resource planning and management are not incorporated into the overall regional growth strategy, resulting in disconnected, fragmented and inequitable distribution of parks, open space, shoreline access, trails, wilderness areas and working farms and forest.

Current efforts to coordinate planning are substantial but organizational structures, advocacy constituencies, and funding sources restrict the collaborative, multi-objective efforts called for in this open space strategy. The reliance on individual local governments means that those with the conservation-minded leadership and/or enough funds can move their open space agendas forward. This results in imbalanced protections that may not necessarily address regional needs.

Open space conservation work in the four-county central Puget Sound region is accomplished through the tireless work of dozens of federal and state agencies, 86 municipalities, nearly 500 taxing authorities, and hundreds of nonprofit and volunteer organizations. The sheer number of organizations demonstrates the magnitude of interest and need for systematic coordination. There are no entities evaluating open space plans or projects to determine priority

on a regional, or often even a local scale. These issues are inextricably linked to the lack of an organizational structure, which is discussed in the need for regional planning.

Without a more organized structure in which to unify open space planning priorities and decisions, there is no urgency to communicate the actions of individual organizations between or among stakeholders. Without an oversight body, organizations and projects tend to focus on a particular geographic area or issue, instead of leveraging the co-benefits of open spaces and actions of other organizations to complete an effort with regional significance. A lack of a unifying vision and balanced strategies or protections across borders hampers the ability of stakeholders to attract larger sums of funding to the region, maximize scarce dollars and secure multiple open space benefits for people and the environment.

The region must remedy this disconnect and create a planning process that joins governmental structures, public and private interests, and creates an agreed-upon unified vision with prioritized actions. This could further garner commitment and support to implement actions for the entire region.

4. Watershed-scale Planning is Critical

While regional open space planning is essential, the need for open space planning at the watershed scale is as well. Open space planning that connects natural and built systems can best be performed at the watershed scale, where jurisdictional boundaries are not dominating criteria, but at a scale where local governments can more easily coordinate efforts. In this way watershed-scale planning becomes a critical link between regional scale planning and local scale planning. A regional open space network needs to be a nested, connected system, and this is not currently the case in the central Puget Sound region.

Comprehensive planning at the watershed scale can be the bridge to help connect environmental planning with land use planning.

By definition a river watershed is a drainage area for a surface water system that connects the mountain fresh water sources to the sea. The watersheds draining to these dynamic river systems also provide transportation systems for people,

plants, and wildlife. The watershed also forms the connection between and through habitats that do not follow the political boundaries of cities and counties. In the central Puget Sound region there are eight major river watersheds, identified by the state water resource inventory area (WRIA) system: Stillaguamish, Snohomish, Cedar-Sammamish, Green-Duwamish, Puyallup White, Chambers-Clover, Kitsap, and Nisqually.

Working with local governmental and advocacy groups, the ROSS team was involved in three Watershed Open Space Strategies (WOSS's), each in varying stages of preliminary planning. These were: the Puyallup-White, Green-Duwamish, and Snohomish watersheds. Valuable lessons were acquired through each of these three planning efforts.

Each WOSS took a slightly different approach, all three aimed to identify targeted local strategies, projects, and actions to better inform development of the overarching ROSS. Prioritized projects were those that would require outside assistance and collaboration; contribute most to the development and function of the inter-watershed, regional open space system; and provide maximum open space values. While each of the three watershed studies employed different processes that reflected the unique needs and capabilities of their constituency, all three engaged local advisors and advocates in the analysis and planning process through a series of interactive meetings and workshops. The WOSS's went beyond considerations for salmon habitat, proving these river watersheds to be effective planning jurisdictions to combine land use, trails, parks, working lands, and habitat for multi-use open space systems. Each is discussed in greater detail in Chapter 4 Analytical Tools.

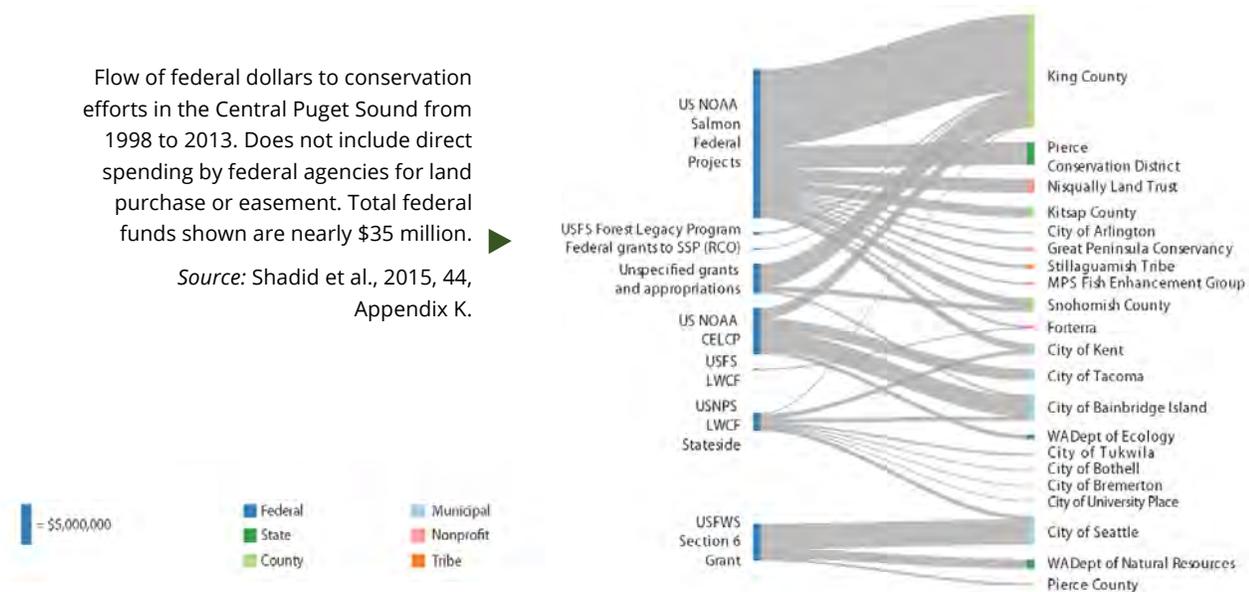
The lessons learned from these three initial planning efforts demonstrate the unique approaches comprehensive watershed open space planning can take to address local interests. The different process approaches also can be used as models for future development of watershed open space strategies in the other five watersheds.

5. Conservation Funding is Inadequate and Fragmented

Funding for open space conservation and restoration efforts is insufficient, unsystematic, and originate from numerous federal and state agencies and programs. Grants typically are made on varying schedules with singular purposes, and are very seldom coordinated to generate multiple benefits. Organizations attempting to initiate or continue funded projects spend far too much time, money, and resources applying for grants when they could be focused on performing the actual conservation work or delivering services for the public to benefit from open space enhancement projects.

Flow of federal dollars to conservation efforts in the Central Puget Sound from 1998 to 2013. Does not include direct spending by federal agencies for land purchase or easement. Total federal funds shown are nearly \$35 million.

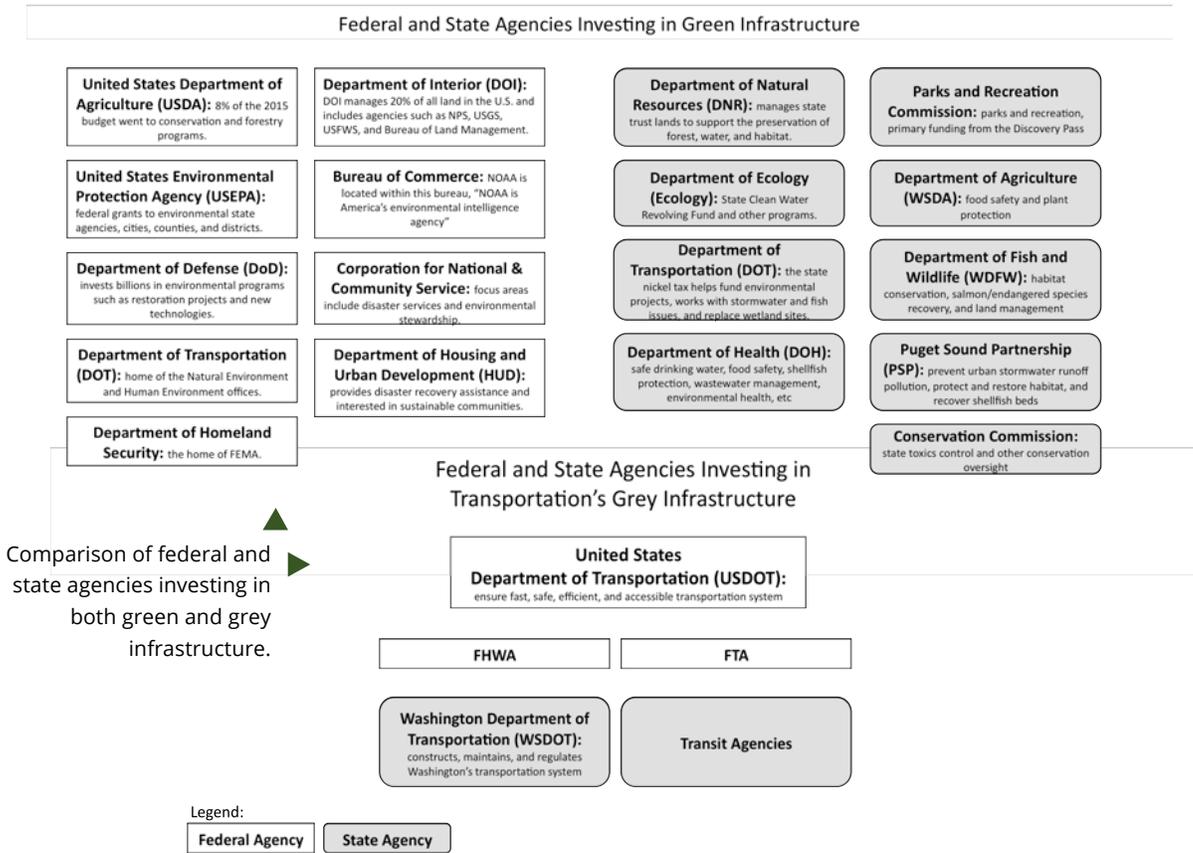
Source: Shadid et al., 2015, 44, Appendix K.



The figure above visually displays the diversity of federal funding sources for conservation projects and a sampling of the wide variety of participants. This system is inefficient and full of redundancies simply because it is so complex.

In 2015 there were nine federal agencies with more than 50 programs that awarded money in the form of grants, contracts, loans, etc. to environmentally based projects across the United States (USA Spending.gov, 2015). These federal agencies with multiple programs provide funding to state agencies with multiple programs – who then fund local and regional organizations and projects – as well as provide funds directly to local organizations. This diversity and sheer number of decision makers, as well as the complexity in flow and limited dollar amounts, contrasts markedly to the flow of other federal spending categories such as transportation. In

Washington state, for instance, there is one federal funding agency that funnels most transportation money to one state agency, WSDOT, and regional transit agencies. This streamlined approach improves the efficiency of transportation efforts. Conservation efforts would benefit from similar streamlining of funding sources and processes.



In 2015, total federal discretionary and mandatory spending totaled \$3.8 trillion. Of that, \$44.85 billion or 1.17 percent of the total was directed at the Energy and Environment sector, compared to \$1.05 trillion (27.42 percent) on Medicare and Health, \$609.3 billion (15.88 percent) on the Military, and \$84.9 billion (2.2 percent) on Transportation. With Transportation receiving twice that allocated to the Energy and Environment sector this implies that each layer of inefficiency within the environmental sector can be even more troubling than in other areas of government due to shortage of dollars available and the costs of the solutions that need resources (National Priorities Project, 2015).

If, instead, open space stakeholders collaborated more to identify and pursue common priorities and funders similarly coordinated priorities to emulate other sectors in their efficiency, such as transportation, there could be opportunities

to become more efficient, freeing up dollars for more activities. Streamlining the funding sources for conservation could help to eliminate redundant efforts by various groups. Further, if this collaboration was taken a step further to sharing resources, efficiencies could continue to increase by reducing administrative costs; improving collaboration would increase synergies and result in more effective methodologies and best practices.

Of the hundreds of nonprofit organizations that existed in 2013⁵ in the four county central Puget Sound region, there were approximately 260 public charities that related to the environment in some way (NCCS, 2015).

	King	Pierce	Snohomish	Kitsap
Number of organizations	179	31	30	23
Private contributions & government grants	\$96,881,054	\$6,299,653	\$12,100,228	\$11,002,230
Total revenue	\$149,127,170	\$11,652,347	\$14,205,033	\$18,392,263
Total expenses	\$138,335,672	\$11,190,670	\$13,636,684	\$17,765,405
Total assets	\$176,470,023	\$24,740,909	\$28,998,261	\$81,134,341

▲ Environmental public charities in King, Pierce, Snohomish, and Kitsap Counties in 2013. *Source:* NCCS, 2015.

These 260 environmentally focused public charities translates to anywhere between 3.5 percent and 7.3 percent of the total public charities in each county. Further, the assets (as defined by the Internal Revenue Service for 501(c)(3) organizations) of environmentally focused public charities in each county are between 0.38 percent and 9.5 percent of the total public charity assets for those same counties. This implies that the environment is not the primary focus of public charities in the four county Puget Sound region, and further, that the assets of most environmental public charities are less than the assets enjoyed by public charities within other sectors (NCCS, 2015). However, if environmental charities were to collaborate more with other charities such as health and equity, the co-benefits to each sector could be substantial to the region.

▼ Percent Difference between Total Public Charities and Environmental Public Charities in 2013. *Source:* NCCS, 2015.

	King	Pierce	Snohomish	Kitsap	Four County Total
Total Public Charities	3,375	875	604	315	5,169
Environmental Public Charities	179	31	30	23	263
Environmental's Percent of Total Public Charities	5.30%	3.54%	4.97%	7.30%	5.09%
Total Assets of Public Charities	\$34,815,684,182	\$6,440,289,223	\$829,547,004	\$854,116,886	\$42,939,637,295
Assets of Environmental Public Charities	\$176,470,023	\$24,740,909	\$28,998,261	\$81,134,341	\$311,343,534
Environmental's Percent of Total Assets	0.51%	0.38%	3.50%	9.50%	0.73%

6. The True Value of Nature Goes Unrecognized

Before a project is approved and completed, whether or not it concerns open spaces or is led by a government agency, a benefit/cost analysis is often conducted. A benefit/cost analysis looks at the upfront and sometimes long term financial costs to implement a project, and weighs this against the potential benefits gained by the investment as currently performed. Benefit/cost analyses are a financial calculation because the traditional measure of benefit or cost has been through the metric of the dollar. These analyses typically calculate if X dollars expended upfront for a project will be a positive or negative monetary investment in the future. The desire for short and long term benefits and financial solvency is understandable, yet benefit/cost analyses have a critical shortcoming: they fail to include the value of natural assets and their long-term monetary contribution to the local economy. The environment has traditionally been considered in qualitative terms that do not translate easily into dollars and cents. However, open space conservation measures have recently been demonstrated to have a high return on investment (ROI), when viewed as investments with multiple benefits. (See also Appendices E and F, Chadsey, et.al, 2015.)

Earth Economics calculated low and high dollar values (in thousands) attributed to each land cover and open space category within the central Puget Sound. Annual contribution to the region's economy is conservatively estimated between \$11.4 and \$25.2 billion. *Source: Chadsey et al., 2015 (see Appendix E).*



Land Cover		Acres	Low	High	Service		Low	High
Forest	Deciduous	130,779	\$349,294	\$695,782		Aesthetic	\$2,293,975	\$9,509,713
	Evergreen	1,797,553	\$4,594,833	\$11,280,912		Air	\$422,203	\$529,187
	Mixed	376,893	\$970,465	\$2,052,403		Food	\$12,587	\$86,472
Wetlands	Emergent Herbaceous	23,777	\$129,607	\$1,083,597		Shelter	\$73,984	\$111,407
	Woody	74,377	\$474,995	\$3,507,100		Water	\$62,605	\$1,925,347
Shrub and Grasslands	Shrub	430,052	\$188,793	\$204,296		Health	\$41,168	\$50,352
	Grassland/ Herbaceous	138,109	\$134,857	\$175,296		Play	\$2,633,343	\$4,132,675
	Pasture/Hay	106,823	\$7,326	\$53,952		Disaster Mitigation	\$1,860,499	\$4,194,473
	Cultivated Crops	14,839	\$1,222	\$37,326		Raw Materials	\$23,279	\$155,093
Open Water and Beach	Beach	28,987	\$1,501,123	\$1,546,772		Waste	\$4,034,301	\$4,568,983
	Lakes	55,392	\$2,273	\$180,345				
	Reservoirs	2,775	\$260	\$2,370				
	Rivers	13,492	\$356,270	\$367,462				
Developed	Saltwater	285,069	\$2,649,788	\$3,912,022				
	Open Space (urban park space)	20,795	\$96,836	\$164,067				
Total		3,499,712	\$11,457,944	\$25,263,700	Total		\$11,457,944	\$25,263,700

Calculating ROI for environmental projects has been difficult. The benefit/cost analysis approach has prevented important, multi-benefit environmental projects from ever progressing past the planning stages. For example it is relatively easy to determine the loss in proceeds from not cutting down a forest

“If we take a conservative approach and consider natural capital as a short-lived economic asset—something that depreciates over time, like a bridge or road—the minimum natural capital asset value of open space in Central Puget Sound is between \$328 billion and \$825 billion. However, unlike built capital, our open space is largely self-sustaining, renewable, and long-lived. Furthermore, as the region continues to grow, our open space resources will increase in value due to their greater scarcity. By using a zero discount rate, over 100 years, the natural capital asset value of the Central Puget Sound region is as high as \$2.6 trillion.”

Source: Chadsey et al., 2015

stand for timber, although the true benefit of that existing forest stand seldom gets quantified in terms of its ability generate revenue for the local community through recreation spending; to purify water and reduce downstream water treatment costs; or to slow or store floodwaters to reduce the vulnerability of communities to flood hazards. These are just some of the many services provided by forest stands that are seldom quantified in an economic sense.

Using the ecosystem service system framework as a means to classify nature's services has helped in enabling their dollar value. Again, ecosystem services (referred to in this report as open space services) are those amenities provided to us by nature typically without dollar payment, such as pollination, pest control, air and water purification, and soil formation (MEA, 2005). These services have been taken for granted by western society, and are declining for reasons such as overconsumption, conversion of resource lands to developed uses, “and the inability to clearly delineate rights and economic markets for these services” (Titcomb, 2015, 2-24; Kollin and Schwab, 2009; Lant et al., 2008; Nowak et al., 2010). Losing open space services is an environmental loss as well as a loss in economic resilience within our communities. Most if not all of these “free” services cannot be replaced with engineered solutions without extremely high energy, time, and dollar inputs. It has been difficult in the past to quantify these services and add them to cost/benefit analyses.

However, after decades of research by academics and practitioners, ecosystem services valuations are slowly entering into the realm of cost/benefit analysis.

Earth Economics, an ecosystem valuation consulting firm, partnered with the ROSS to help calculate the value of open space in the central Puget Sound region using select categories of “open space services”. The ROSS team reformatted the MEA ecosystem service framework to an “open space service” rubric to more directly address the benefits provided by both natural and built landscapes, for environmental social and cultural values. According to their 2015 report, open space in the Central Puget Sound is a multi-billion dollar economic asset, providing between \$11.4 and \$25.2 billion annually to the regional economy (see Appendix E, Chadsey, et.al., 2015). (This valuation method was used by the ROSS project team in an analysis of resource lands in a portion of the Puyallup-White watershed. See Chapter 4 for details.)

7. Data Services Need to Target Decision Making

Scientists were startled in 1980 by the discovery of a tremendous diversity of insects in tropical forests. In one study of just 19 trees in Panama, 80% of the 1,200 beetle species discovered were previously unknown to science. Surprisingly, scientists have a better understanding of how many stars there are in the galaxy than how many species there are on Earth.

Source: World Resources Institute (WRI).

The process to determine the baseline condition for regional open space conservation is difficult. This is the case because environmental information is located in numerous places and with no consistent data across geographies linked with parcel-level GIS land use and transportation data. Some cities and counties have well managed data systems, but this is not true across the region. The lack of a consistent database impedes the ability to conduct meaningful analysis at the regional or even watershed level, and makes monitoring progress or evaluating overall performance difficult. The ROSS team encountered this challenge first hand as it engaged in the development of the watershed open space strategies (WOSS). Difficulties accessing consistent data across a watershed was a major factor in the team's ability to conduct more WOSSs. Other databases, such as regional transportation networks are generally more robust and consolidated within one agency, allowing for more efficient analysis and monitoring.

In addition to the lack of mapping data and tools, it is clear that the under-valuation of nature has resulted in an inadequate investment in research on natural systems and their relationship to human systems. Federal and state funding to conduct research on environmental issues that we depend on for sustainable living is an enormous need. For instance, there is no data on nearly one third of the indicators the Puget Sound Partnership is monitoring to determine progress toward Puget Sound recovery (Hamel, 2015).

The region would benefit from a comprehensive, consolidated, approach to identify data needs and coordination. This would help to pursue funding that would more adequately inform decision-making. Funding also needs to be garnered to monitor implementation of activities and projects for their effectiveness in meeting expectations.

8. Regional Collaboration Needs a Boost

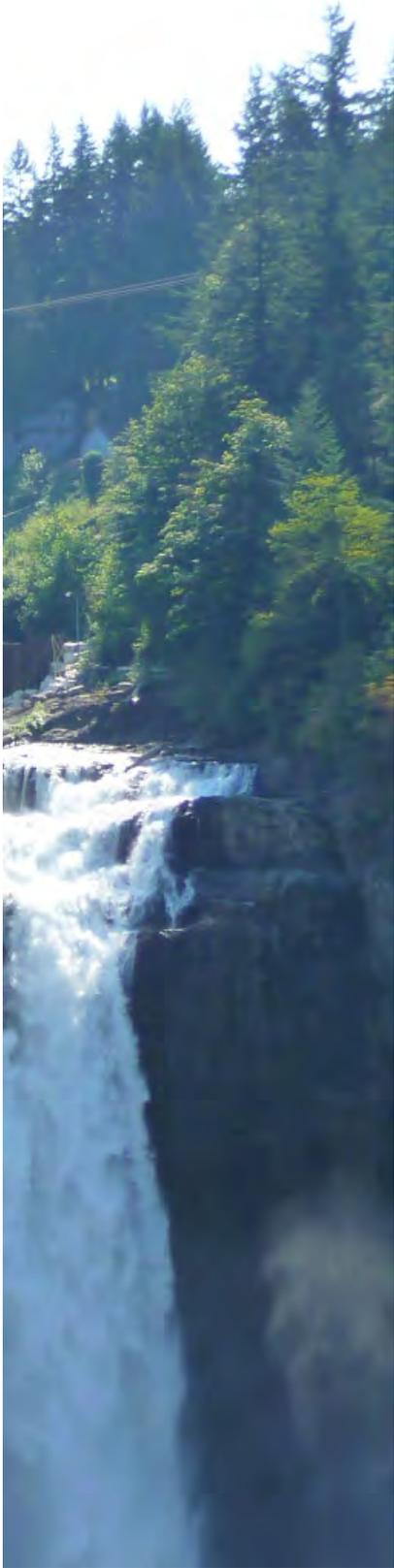
The Central Puget Sound Region has an abundance of NGOs, government agencies, businesses, and citizens that are interested in bettering or maintaining the region's open space network. While there is some collaboration between groups, each entity tends to work on its own towards achieving its own worthy goals. Without the tireless efforts of these existing groups, the open space system that we currently enjoy in the Puget Sound would not be the same.

Many embrace a similar philosophy as the ROSS, simultaneously generating multiple public benefits, using interdisciplinary approaches, and advancing initiatives at multi-jurisdictional scales. If these organizations could collaborate through more systematic partnerships, alliances, or agreements, the region's open space system would markedly benefit.

Collaboration, or open communication across and among groups, could bring about improvements through reducing any redundant efforts, and more efficiently address any opportunities or gaps. This sharing could be between a few or numerous stakeholders and could include sharing of information, experience, methodologies, or even resources and new ideas if an agreed upon system or framework for collaboration is put in place.

As it currently stands, there are dozens of entities focusing on hundreds of different or similar projects across the region without consistent communication or vision. (As an overly generalized example, in the category of public charities, there are over 250 with an environmental focus in the four-county region (NCCS, 2013).) There are forums and meetings scheduled throughout the year although there do not seem to be working groups that regularly meet to discuss current projects, priorities, strategies, events and funding sources. The results are some very well protected landscapes although they form a patchwork open space network instead of a connected system. If there were one vision and strategy to unite under, they could look beyond the individual trees and see the entire forest. More specifically, they could "avoid lengthy and expensive conflicts over resource use, foster innovative solutions to technical problems, and create more adaptive and resilient policy solutions" that cross jurisdictions and individual's abilities (Shadid et al., 2015, 7, Appendix K). See Chapter 3 for how this collaboration could be implemented in the region.



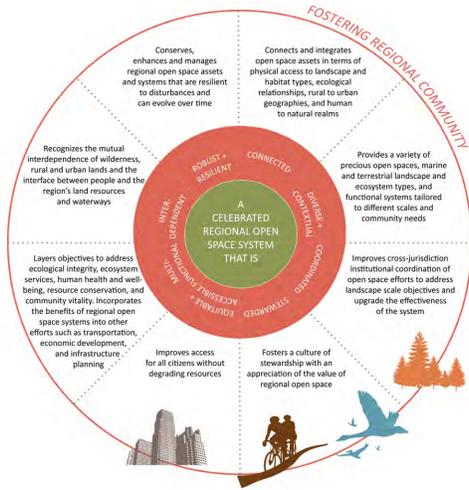


Chapter 3

Recommended Regional Strategy

CHAPTER 3: RECOMMENDED STRATEGY

A Regional Open Space Strategy



Vision and Values for the Regional Open Space System (ROSS) generated by over 100 expert participants in the Preliminary Comprehensive Strategy process.

For the past five years, the ROSS has advanced an all-embracing definition of “open space,” incorporating recreational spaces and trails, healthy ecosystems, working landscapes such as farms and forests, community parks, and other open space amenities. The ROSS began with the development of a Preliminary Comprehensive Strategy, which engaged over 100 stakeholder representatives to identify the desired qualities of a regional green infrastructure system. This report also helped to create a roadmap for establishing a final strategy for the central Puget Sound region. That Preliminary Report recommended working with communities at the individual watershed scale, while simultaneously developing tools and processes to measure and emphasize regional connections. The goal was to merge visions and prioritize local actions into a regional whole. The Preliminary Strategy also called for an integrated spatial vision that optimized open space benefits, and applied landscape ecology and ecosystem services concepts to guide decision-making.

ROSS VISION AND VALUES: A CELEBRATED REGIONAL OPEN SPACE SYSTEM THAT IS:	
ROBUST + RESILIENT	Conserves, enhances and manages regional open space assets and systems that are resilient to disturbances and can evolve over time
CONNECTED	Connects and integrates open space assets in terms of physical access to landscape and habitat types, ecological relationships, rural to urban geographies, and human to natural realms
DIVERSE + CONTEXTUAL	Provides a variety of precious open spaces, marine and terrestrial landscape and ecosystem types, and functional systems tailored to different scales and community needs
COORDINATED	Improves cross-jurisdiction institutional coordination of open space efforts to address landscape scale objectives and upgrade the effectiveness of the system
STEWARDED	Fosters a cultural of stewardship with an appreciation of the value of regional open space
EQUITABLE + ACCESSIBLE	Improves access for all citizens without degrading resources
MULTI-FUNCTIONAL	Layers objectives to address ecological integrity, ecosystem services, human health and well-being, resource conservation, and community vitality. Incorporates the benefits of regional open space systems into other efforts such as transportation, economic development, and infrastructure planning.
INTERDEPENDENT	Recognizes the mutual interdependence of wilderness, rural and urban lands and the interface between people and the region’s land resources and waterways

Based on the Preliminary Comprehensive Strategy, and in response to the key findings presented in Chapter 2, the ROSS team adopted four primary goals to:

1. Envision a robust, **connected regional open space system** and **identify priority projects**;
2. Improve **regional coordination**;
3. Expand and apply **analytical tools to measure** and convey open space value and inform project prioritization; and
4. Cultivate a **regional open space advocacy community**, including private, non-profit and governmental stakeholders.

To achieve these goals, the ROSS team recommends five main actions that together constitute a general strategy to protect and enhance the open space system throughout the central Puget Sound region:

1. **Create a dynamic regional vision**;
2. **Establish an integrating regional planning structure**;
3. **Expand and streamline funding**;
4. **Advance supportive tools**; and
5. **Convene a collaborative alliance**

While each of these actions could be advanced separately and would result in regional benefit on their own, the strategy will have its most profound effect when implemented as one.

Create a Dynamic Regional Vision

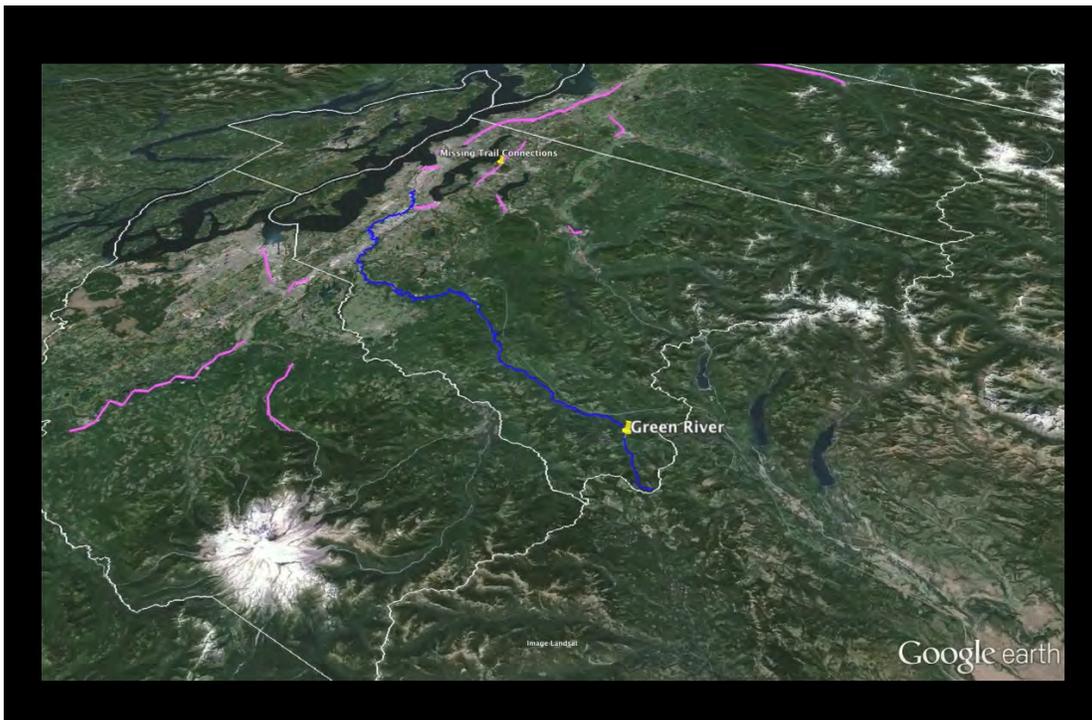
In many ways the central Puget Sound region has already initiated a regional open space vision. The distinction between urban growth areas and rural areas under VISION 2040 and its predecessor VISION 2020, underscores the desires of the region to focus growth within compact urban communities to preserve rural areas and resource lands. This is the broad-based shared vision that the region has agreed to and been planning under since 1990. This framework was purposeful in order to ensure the continued viability of resource-based industries such as forestry and agriculture into the future. At this macro scale, VISION has been successful as the vast majority of the regional landscape continues to be protected as forest land. However, as our urban areas become more dense and rural areas, often working farms reserved for urban growth, are being developed, it is essential to ensure open space is not neglected in the places where we live and

work and that those open spaces are connected for context and continuity. Just as VISION 2020 was the first integrated long-range growth and transportation strategy for the region, it is now time to refine that initial macro-scale vision with a new overarching regional vision of a connected open space system that integrates with existing growth and transportation efforts, rural and urban, for maximum regional benefit. As our urban areas become more dense and our urban growth areas reserved for expansion begin to be appropriated, it is essential that we examine our open space needs and ensure we preserve open space lands to meet our growing needs. The regional open space vision needs to be articulated in goals, policies and objectives as well as geographically spatialized into a map product. Developing a comprehensive vision of this magnitude requires considerable public input, time and resources. For these reasons, the ROSS team utilized existing broad-scale goals, policies, and objectives to focus on demonstrating how these vision concepts could be spatialized into a map to ensure continuity and equity and demonstrate what a spatialized vision might look like for purposes of initiating dialogue on a broader open space vision.

A common element of successful conservation efforts locally and across the U.S. – such as the Mountains to Sound Greenway in the Puget Sound region – is a map displaying a group’s vision highlighting the areas to be conserved to achieve that vision. It is customary that planning efforts include a graphic or map that illustrates agreement on the geographic location and extent of focus for the effort, such as land use comprehensive maps or zoning maps. This spatialized element of a vision allows stakeholders and partners to coalesce and begin to speak the same language. The scale and level of detail is usually dependent on the size of the land area in question, more detailed for a parcel-specific area and, more conceptual the larger the land area. Like the “fuzzy greenline” discussed in Chapter 2. For the ROSS as a regional effort, the map at this point needs to be conceptual, but sketching the open space vision even with “fuzzy” lines is fundamental for dialogue and coming to any kind of agreement. This visualization is important for stakeholders to see and share in order to galvanize action.

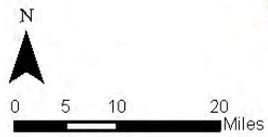
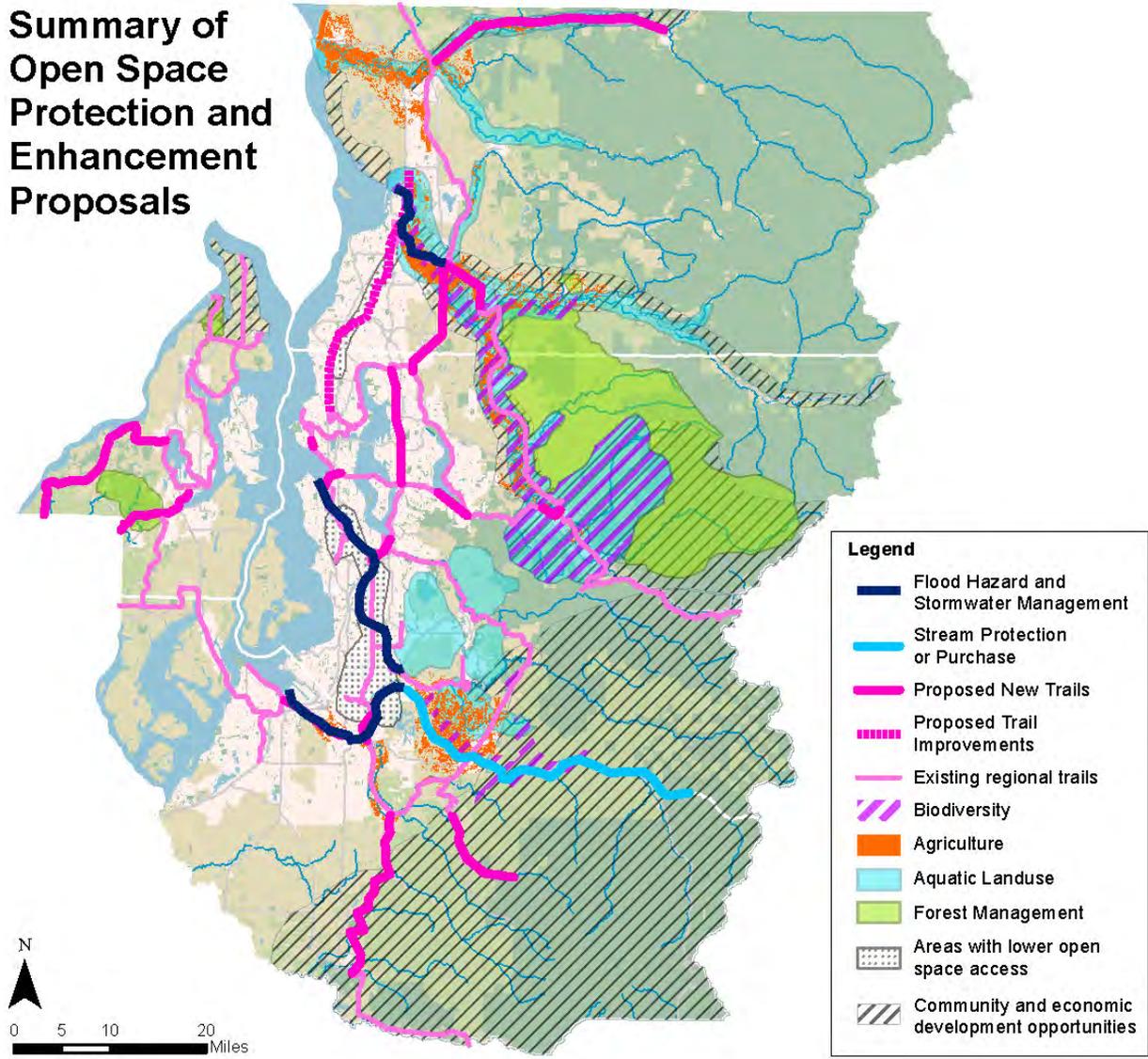
At first, the ROSS intended to incorporate eight watershed open space strategies (WOSSs), one for each of the region’s watersheds, and then combine these to create one regional plan. Due to timing and funding limitations, the ROSS team was unable to complete all eight, but valuable lessons were

acquired through involvement in three, the Puyallup-White, the Green-Duwamish and the Snohomish watersheds. To initialize a regional vision, the ROSS team applied outcomes from the three WOSS's, and conducted additional geospatial analyses and engaged experts and advocates from the other watersheds on their areas of concern. On a preliminary level, this activity helped to identify the most critical landscapes to conserve, restore, and expand in the four-county region. The resulting spatialized vision is a sketch, or a mock-up to be built upon by partners and constituents. (See Chapter 4 for more details.)



Screenshot from the ROSS Video speaking to the need for trail connectivity across the region. Moreover, *"...we must preserve open space for the generations after us."*

Summary of Open Space Protection and Enhancement Proposals



▲ Initial ROSS Sketch

A vision without a plan is just a dream. A plan without a vision is just drudgery. But a vision with a plan can change the world.
— Old Proverb

The ROSS Sketch targets priority areas including working farm and forest lands; recreation, trail connections, and community open space; habitat protection and restoration; and flood hazard areas, among others, while advancing public health and safety, social equity, economic development and climate resilience (see Chapter 4 for more information). Using digital flyover software, the ROSS team also incorporated a three-dimensional video flythrough of the interconnected spatial priorities to present the key components of this sketch in a medium that could reach a broad audience. This strategy will need to be expanded and further refined to be comprehensively applied to the region. (See Appendix M on disk or on website at www.openspacepugetsound.org.)

Simultaneously to create a more complete, comprehensive, and spatialized vision, an umbrella strategy to help transition this vision into specific plans needs to be articulated for implementation into the future. This would entail refining goals, and developing new policies and objectives to address the issues and opportunities of the vision across jurisdictional and geographic boundaries. Leadership for this effort would need to be assumed by a new or existing regional entity (see next section below).

With one vision and strategy the region could make progress towards shared goals, working simultaneously on local and regional scales, similar to how the region has planned growth and transportation into the future. The lessons learned from this collaborative effort could inform how refinements and future updates could be better organized and aligned.

Establish an Integrating Regional Planning Structure

In the face of increased human population growth (projected at 1.4 million people by 2020) and the impact of ongoing land use activities, the ability to recover Chinook salmon can only occur through a combination of habitat restoration and protection.

Source: NOAA Fisheries, 2007, ES pg VII)

Two major planning efforts have been on-going in the Puget Sound region for well over 20 years. One is focused on land use and transportation planning; the other is focused on environmental planning, notably to recover Puget Sound. While they are inextricably linked, they are largely conducted as independent processes despite the reality that Puget Sound recovery depends heavily on freshwater quality and freshwater is dependent on how we use the land. As described in Chapter 2, land use planning has traditionally focused on the built environment, where environmental planning has focused on the natural environment. Even with today's emphasis on sustainability where built and natural environments ought to be considered simultaneously in our planning processes, they continue to be conducted separately,

often within the same organizations. This hinders our progress toward integration and regional sustainability.

Puget Sound recovery is within the jurisdiction of the Puget Sound Partnership (PSP) a state agency with geographic reach in 12 counties and 14 watersheds, but with no land use authority. Its mission to “accelerate the collective effort to recover and sustain the Puget Sound” is tied to the federally adopted National Marine Fisheries Service’s 2007 Puget Sound Salmon Recovery Plan under the national Endangered Species Act and the federal Environmental Protection Agency’s (EPA) Comprehensive Conservation and Management Plan under the national Clean Water Act.

Land use in Washington state is governed by the Growth Management Act (GMA) adopted by the state legislature in 1990. The act requires counties and cities to collaborate and manage population, housing, and job growth. Preserving the environment and protecting valuable resources such as farm and forest land are among key GMA goals. The GMA calls on counties and cities to accommodate growth and create great communities. The Puget Sound Regional Council (PSRC) is the forum for that GMA collaboration in the four-county central Puget Sound region. Though environment and open space have not been prioritized in PSRC’s work plan, policies within its guiding document, VISION 2040, clearly articulate that a vibrant economy and healthy communities are dependent on a healthy environment .

Through VISION 2040 and its precursors, the PSRC has a long-established working relationship among its local government members to be the first line convener under GMA. As a road map, VISION 2040 has helped the region do a remarkable job of preserving resource lands in rural areas and maintaining density in urban areas. While this work has united the region to the urban/rural development pattern, without a physical open space plan illustrated on a map and commitment to protect remaining open space, these lands could easily be lost to development and incrementally lost as critical assets for maintaining healthy communities and a sustainable region.

The ROSS recommends that a regional entity with land use expertise be authorized and resourced to guide and coordinate open space activities across the four counties. As of this writing, the ROSS team finds that the PSRC is the only regional entity positioned to provide this type of needed regional leadership and coordination and recommends PSRC take on this function. Since 8 of the 14 watersheds in PSP’s jurisdiction are located within the four county central Puget

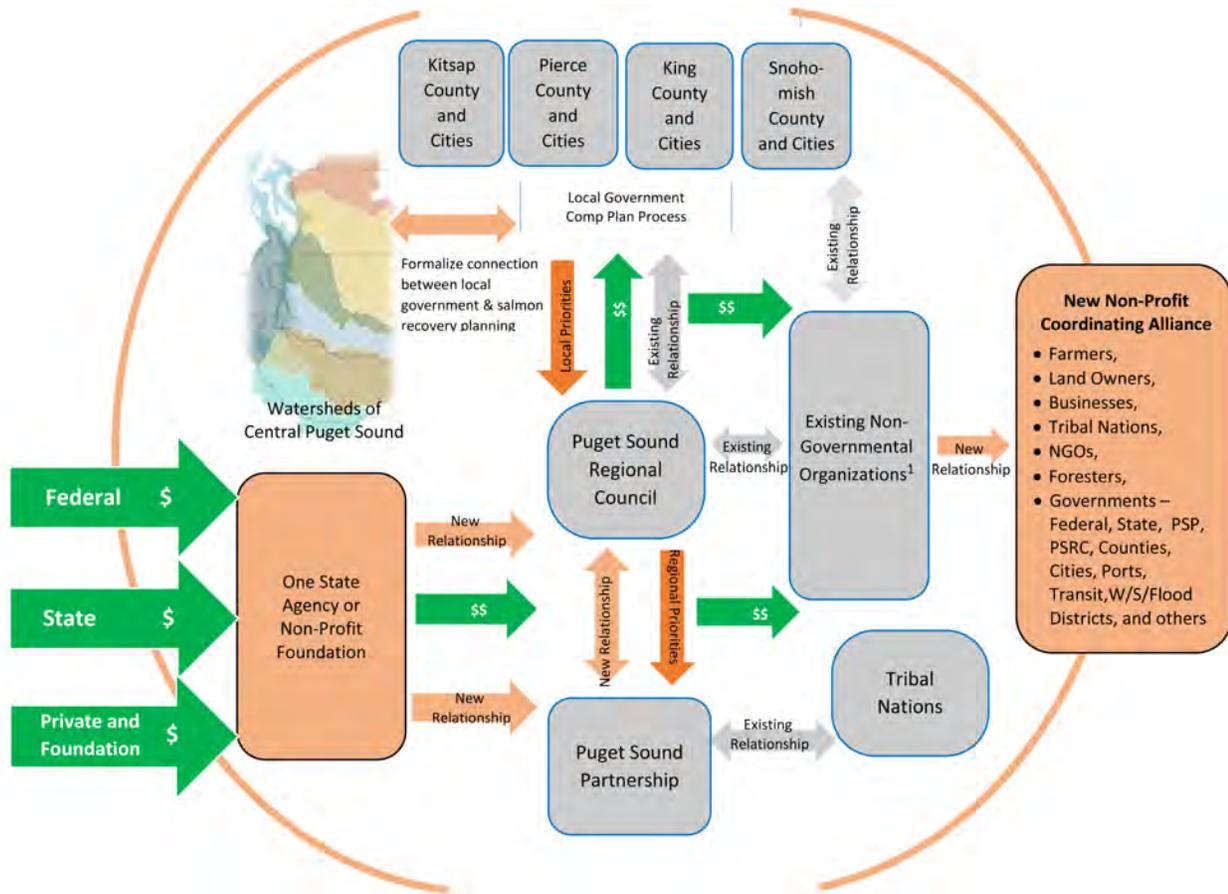
Sound region, the PSRC with its land use expertise could provide a beneficial influence on a majority of PSP's membership. In the absence of another entity that might provide regional open space planning services, for purposes of facilitating this discussion, the PSRC will be the surrogate for this regional entity.

The following actions could assist to institutionalize organizational links and improve connections between environmental and land use planning:

- Pilot a partnership between the PSRC and PSP – this pilot would endorse PSRC to integrate its environmental planning efforts focused on salmon recovery and water quality with local government comprehensive land use planning within its four-county area with PSP oversight.
- PSRC would convene stakeholders as an open space advisory council or committee, with wide representation. This is to ensure participation on the council is complete and equitable by including Tribal nations, cities, communities of color and low income communities. PSRC's existing Growth Management Policy Board could serve in this function, or a committee of the Board, or a separate council with oversight by PSRC's Executive Committee.
- As an initial step, PSRC could develop a conceptual regional open space plan, initially using salmon recovery plans as a foundation and incorporating open space concepts from member comprehensive plans.
PSRC and partners would prioritize programs and projects consistent with the open space vision and PSP goals and objectives to assist in funding acquisition and allocations for programs.

This type of regional governance model is key to improving efficiencies as it will integrate environmental priorities with land use and transportation planning priorities, better synchronize growth strategies, and more fully embrace the intent of GMA. Such a comprehensive framework would help the region realize the multiple benefits and efficiencies that would result from integrating planning efforts. Further, these actions would institutionalize connections as well as the actual preservation of open spaces.

One example of a regional planning and funding structure illustrating ROSS recommendations to formalize connections and streamline funding.



Expand and Streamline Funding

The second part to the ROSS recommendation to institutionalize connections is related to streamlining funding. As noted in Chapter 2, existing funding is fragmented and complicated, resulting in inefficient distribution of very limited funds. There are any number of ways that funding could be streamlined. Several efforts are underway by federal and state agencies. The recommendations below serve to further stimulate conversation and action.

The region needs to encourage federal and state funders to simplify allocation of conservation dollars. Efforts have been initiated by some federal agencies with the “coordinated investment” project. It has been in initial planning stages and as of this writing appears to be focused on coordinating federal and state agencies around project-specific salmon restoration projects in a particular sub-basin. ROSS suggests a more programmatic effort is needed to reduce the inefficiencies of multiple levels of administration and competition. Puget Sound-wide coordination improvements are needed, especially to address the urgency of attaining recovery goals with scarce conservation dollars while also addressing regional challenges and priorities and ensuring continuous flows of open space benefits. Federal funding for a coordinated Puget Sound open space system could provide a model for pilot projects in other growing municipal regions.

Streamlining regional open space funding dollars could be accomplished utilizing a model similar to that already in place by the Washington State Department of Transportation (WSDOT) for transportation projects funded by the USDOT. This model has been proven effective and could be accomplished through:

- Encouraging federal and state agencies to centralize large blocks of dollars into as few categories as possible (i.e., planning, education, outreach, acquisition, restoration projects).
- Allocating a majority of conservation funds directly to a regional entity (such as a non-profit foundation, a new regional open space authority, or to a single state agency such as the Recreation and Conservation Office) for approved prioritized programs, projects, and activities.

The ROSS suggests the use of a non-profit foundation as the mechanism to raise and distribute money to prioritized regional and local conservation projects. Such a non-profit would provide a nimble and flexible mechanism to respond to

H.R.360 PUGET-SOS, or Promoting United Government Efforts to Save Our Sound. The goal behind H.R. 3630 is to declare Puget Sound a water body of national significance and designate an EPA office dedicated to Puget Sound's health. It would align federal environmental efforts with those of state and local governments and tribes, which have treaty rights to a share of fish and shellfish found in Puget Sound waters.

Read more here:

<http://www.theolympian.com/opinion/editorials/article71262762.html#storylink=cpy>

opportunities where governmental agencies are not as able to be responsive. One option could be the foundation created in 2008 through PSP authorization (RCW90.71.240). The foundation has largely been inactive and the geographic scope of the PSP does not align perfectly with the four county ROSS study area, but allocations could be made to be geographically equitable. The rules of engagement would be developed by the foundation, assuredly after great discussion. The foundation could also function as a mitigation fee-in-lieu bank, credit transfer authority, or other finance instrument.

Finally, the non-profit foundation would demonstrate to potential grantors and funders that the region is ready to take on new funds to protect open spaces. Should a new funding source become available, as is contemplated through the Puget SOS proposal introduced in Congress (HR 3630), the foundation will be a signal that the central Puget Sound region has a prioritized plan and a mechanism to receive and distribute funds.

These actions could reduce NGO and governmental staff hours currently devoted to responding to grant requests, where they could instead be focused on direct services benefiting open space resources.

Sharing and distributing government and/or private foundation funds in this manner represents a large change from the status quo. As a result, many organizations may be hesitant to collaborate on this framework. The transition to this structure would undoubtedly need to be slow, and spread out over several years, or could be used strictly for new government or private funding awards.

To begin this transition, the boundaries and framework for collaboration must be explicit, transparent, and inclusive, as “collaborative governance is more likely to be successful when each participant expects to benefit from working together, and when power imbalances and past history do not deter participants from joining” (Shadid et al., 2015, 4, Appendix K).

Advance Supportive Tools

It is essential that information and tools to enable planning efforts be more widely available to better document existing baseline conditions, plan for future growth, evaluate options, and monitor and adaptively manage progress on their targeted efforts.

Geographically consistent data to understand landscape processes are lacking. To be effective for integrated planning,

data and tools that consider open space services, climate resilience, human health, and social equity will require an expanded regional database of environmental and socio-economic information linked to land use. These data services need to be housed and maintained in one accessible location and made available for use by the region's policymakers.

Based on the experience and findings of the ROSS team, the region would benefit from a comprehensive, consolidated, approach to supply data and research needs to help prioritize decisions related to open space investments.

Consolidate Data Services

Creating and maintaining a comprehensive and detailed database available to local governments requires an entity that is credible and trusted. Funding is needed both to establish the database and to be able to monitor implementation of local and regional projects for their effectiveness in meeting expectations.

To that end, the ROSS recommends that the region identify a central repository for GIS-based spatial data on land use, environmental and resource attributes. As the go-to agency for demographic and transportation information, the PSRC may be the most likely organization to assume this responsibility. However there are others who provide access to an abundance of data. The Municipal Services Research Center (MSRC) has been assisting local governments with information for more than 80 years; the University of Washington's GIS geodatabase has been a critical resource for ROSS planning efforts; and several state agencies such as the Departments of Ecology, Fish and Wildlife, and Commerce could be effective clearinghouses and facilitators. Both authority and funding to enable this consolidation have been and will continue to be major challenges. With champions to encourage this basic activity this region and others will benefit significantly. Centralizing responsibility in one entity will facilitate identifying data gaps and needs, and making funding requests to rectify the discrepancies.

Develop Tools to Support Decision Making

The Trust for Public Land (TPL), a ROSS partner, is already addressing this need for tools that convey ecosystem or open space service values of our regional landscapes with the creation of an online Open Space Benefits Assessment Tool which is currently under development. (See Chapter 4 for more details.) By analyzing open space services of the region's

land cover types this tool will offer opportunities to compare the qualitative costs and benefits, and tradeoffs between different land management proposals, practices and conservation efforts. The goal is to assemble a robust set of regionally-specific open space service data that can be expressed visually and made broadly accessible.

The tool's purpose is to assist with more informed decision making regarding open spaces for the benefit of the region. Instead of assessing alternative conservation actions strictly in terms of monetary costs of land acquisition or initial project capital costs, as is done with traditional cost/benefit analyses, the tool can help expand the region's understanding of the specific benefits that can be achieved with open space conservation and enhancement, such as air and water quality, public health, and carbon storage, among other factors. The tool is designed to display how these open space services can be used to avoid the higher costs of grey infrastructure investment in services that perform similar functions, and to address major regional challenges.

Additional tools, especially related to monitoring and adaptively managing our efforts are also needed. For example, linking permits issued for development to determine how much land is turned into impervious surfaces on at least a biannual basis would be a tremendous aid. It would allow decision makers to respond more quickly to improve regulations that may not be working as anticipated.

Promote Ecosystem Services Valuation

Ecosystem service valuation offers an additional tool that can be combined with watershed-based planning and help local governments think regionally, in terms of the monetary value of these services. The tool policymakers traditionally rely on to decide which projects to approve – a cost/benefit analysis – is fundamentally flawed, skewed towards capital projects with short term returns while overlooking long term environmental benefits. How do we account for costs associated with the loss of open spaces and their services in the cost/benefit analysis? How can we quantify something that up until now has been almost exclusively qualitative? In other words, how can we determine the true value of nature?

To estimate the economic value provided by open spaces, Earth Economics was able to assign annual dollars of goods and services from the region's open space to the local economy (Chadsey et al., 2015, Appendix F). (The values for open space service within the central Puget Sound region are

shown in Chapter 2.)

While these are working estimates to be refined over time through more research, they can be used to better estimate the benefits of open space projects within the central Puget Sound region by incorporating diverse values into traditional cost/benefit analyses.

Convene a Collaborative Alliance

Effective implementation of the strategies and actions suggested in this report will require the active participation of a multitude of public, private, and non-profit entities.

Remarkable work very much aligned with the ROSS vision and strategy is already underway and deserves significant recognition, participation and support. Included among these efforts is Forterra's Cascade Agenda, the Nature Conservancy's Puget Sound Waters program, Puget Sound Partnership's Action Agenda, Mountain to Sound Greenway's Heritage Corridor initiative, Floodplains by Design projects in various river basins, and more. These independent projects and initiatives substantially overlap in geography and intent.

Similarly, governmental entities across the four-county region increasingly recognize the contributions of open space conservation to the central Puget Sound region's ecological health, economic vitality, and human well-being. Federal agency representatives from the US Forest Service and the National Park Service participated actively in advising the ROSS process. Their participation reflects a welcome commitment to intergovernmental cooperation and recognition of the significant contributions of federal lands to urban watershed health and resilience.

Likewise, the State of Washington, primarily through its Departments of Natural Resources and Ecology, is active in advancing the objectives of the ROSS both as a landowner and in its regulatory capacity. And, county and municipal governments have enormous responsibility to guide development patterns and regulate land-use in order to ensure open space assets are conserved and continue to provide critical infrastructure benefits consistent with local government plans and policies. The Puget Sound Regional Council (PSRC) serves to convene local government leaders, assist them to ensure planning consistency across the four-county area, review local and countywide comprehensive plans, and provide technical support on emergent challenges or opportunities which demand a regional response, especially

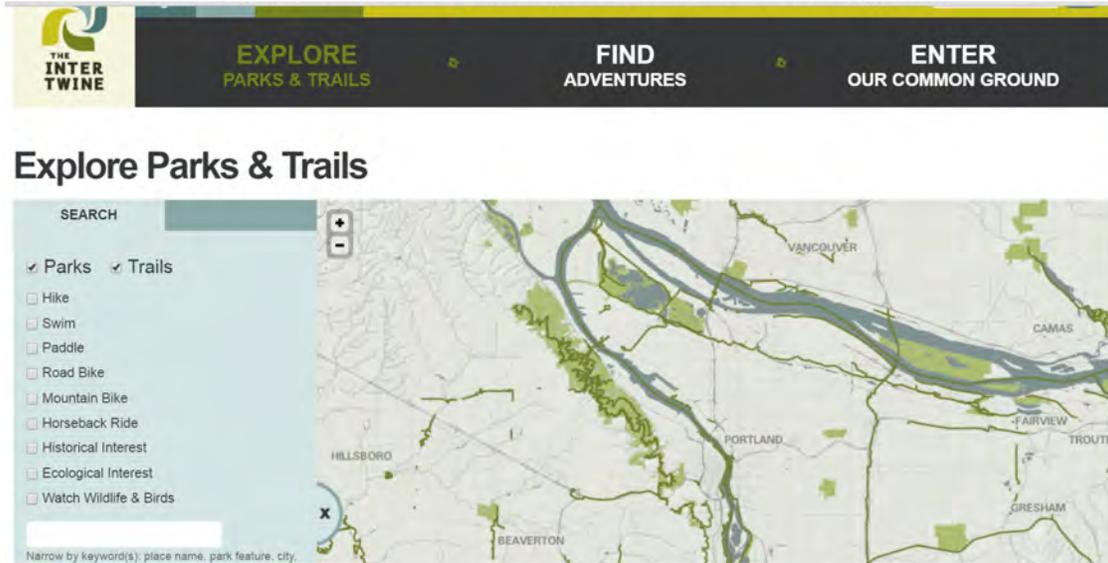
as they relate to transportation. An excellent example is the ongoing multijurisdictional climate adaptation dialogue hosted by PSRC and facilitated by the Institute for Sustainable Communities.

These governmental and nongovernmental initiatives and programs provide a firm foundation on which to move the Regional Open Space Strategy forward. However, as has been discovered in more than a dozen regions across the country, such efforts can substantially benefit by becoming nested within and having the support of a collaborative and politically influential public, private, non-profit alliance. As illustrated by the Bay Area Open Space Council, Chicago Wilderness, and Portland's Intertwine Alliance, such a metropolitan scale open space alliance can serve to support and connect leaders in conservation, health, business, science, education, and government, and enable improved coordination and progress toward common goals. To date the ROSS has served this role on a limited basis by bringing together a diverse Executive Committee, and engaging dozens of others on various task forces and work groups. With the ROSS effort now shifting away from research and development, it will be essential for the pending implementation phase to include the creation of an effective and supportive community of support.

The ROSS recommends the creation of a new umbrella coordinating organization – an alliance - to serve in this role. The organization would provide a forum for collaboration; regularly convene the region's open space conservation stakeholders on pertinent topics; aim to improve communication and coordination across sectors; bring to the surface opportunities for cross-sector partnerships; and encourage resource-sharing. The organization also could facilitate advocacy for policies, programs, and projects that promote a common conservation agenda.

The organization itself need not compete with other organizations to fund projects. It could be membership-funded specifically to support the partners' needs for activities such as providing a communication platform, providing forums for cross sector collaboration and shared learning, and promoting the many individually-sponsored recreational opportunities throughout the region. In addition to conservation, recreation, and parks, the organization could work across the many disciplines and sectors, including health, youth engagement, urban forestry, climate response, green infrastructure, equity and inclusion, and economic development.

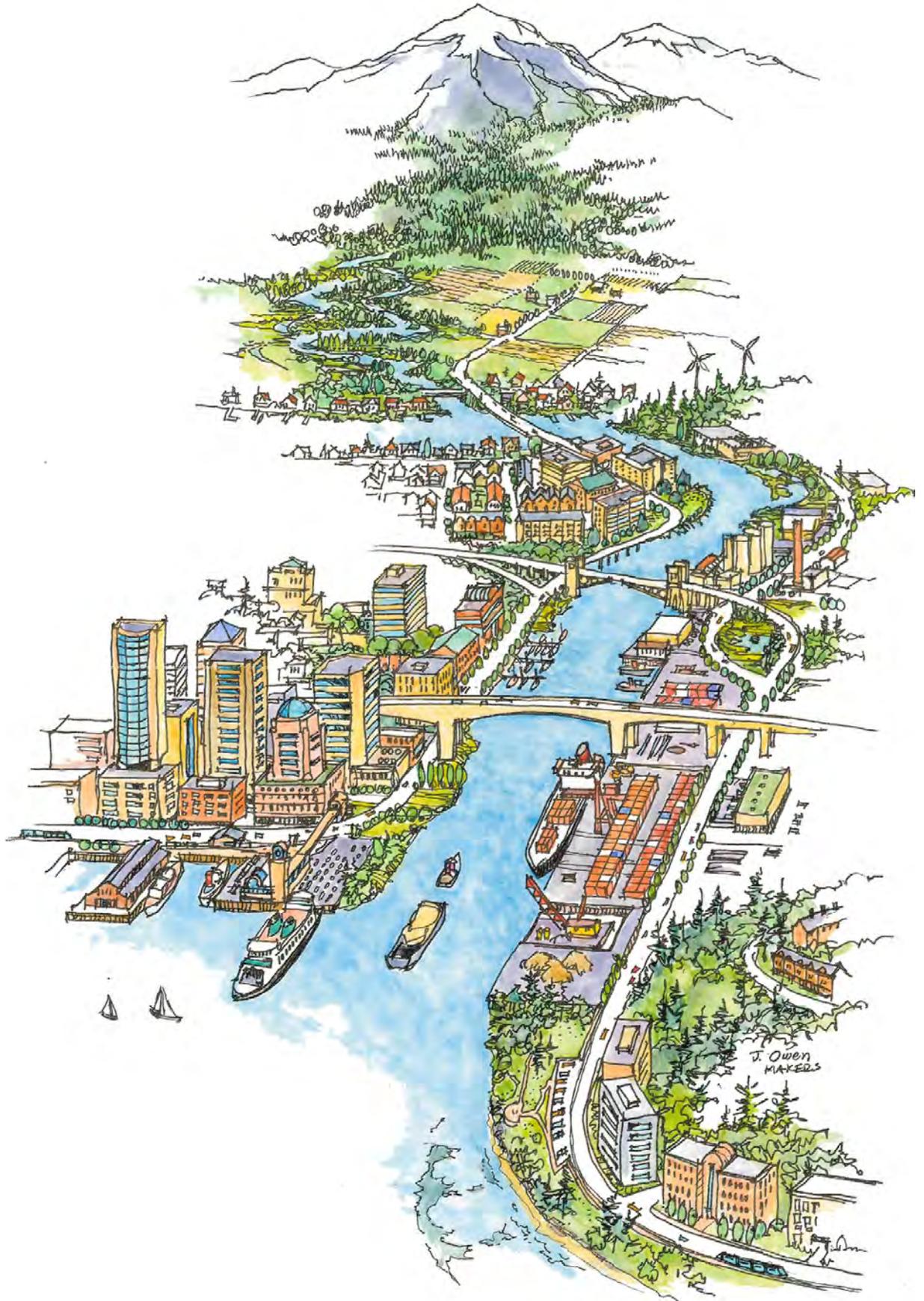
The Intertwine



The goal of the Alliance is to serve “as a convener, facilitator, communicator and backbone organization...[that] supports strategic conversations, initiatives and collaboration projects that help...partners increase their impact” (The Intertwine, 2016).

Summary

The five actions comprising the Regional Open Space Strategy provide a powerful framework for accelerating and expanding the region’s conservation and open space enhancement goals. Advancing any of the above actions individually would significantly benefit the region, yet they will have the most profound effect when implemented in unison. Transforming a vision into reality requires an organizational structure, complete with leadership to nurture its development, and sustained funding for implementation. And the details matter. Consistent, complete data is the foundation upon which a shared vision rests, and a transparent process within the framework around which it is built. These pieces, bolstered by a supportive, connected, and broad-based community of support, can set the central Puget Sound region on a successful course.



Chapter 4

Spatializing a Regional Vision

- ◀ Watersheds stretching from the Cascade Mountains to Puget Sound contain connected landscapes that influence each other ecologically, socially, and economically.

CHAPTER 4: SPATIALIZING A REGIONAL VISION

When the water flows, the positive benefits of open space are clearest. If we follow this tract in our open space planning, we are at once securing the prime lands and the lands, which give linkage and continuity – in a word, regional design.

- Whyte, 1968

Any open space strategy must include an integrated set of physical conservation and enhancement measures along with their location, extent, and objectives. This section describes a very preliminary list of regionally significant open space/green infrastructure concepts that if combined and coordinated could begin to make up a physical component of the open space strategy. For purposes of this document we refer to the spatialization or graphic representation of a regional vision as the ROSS Sketch.

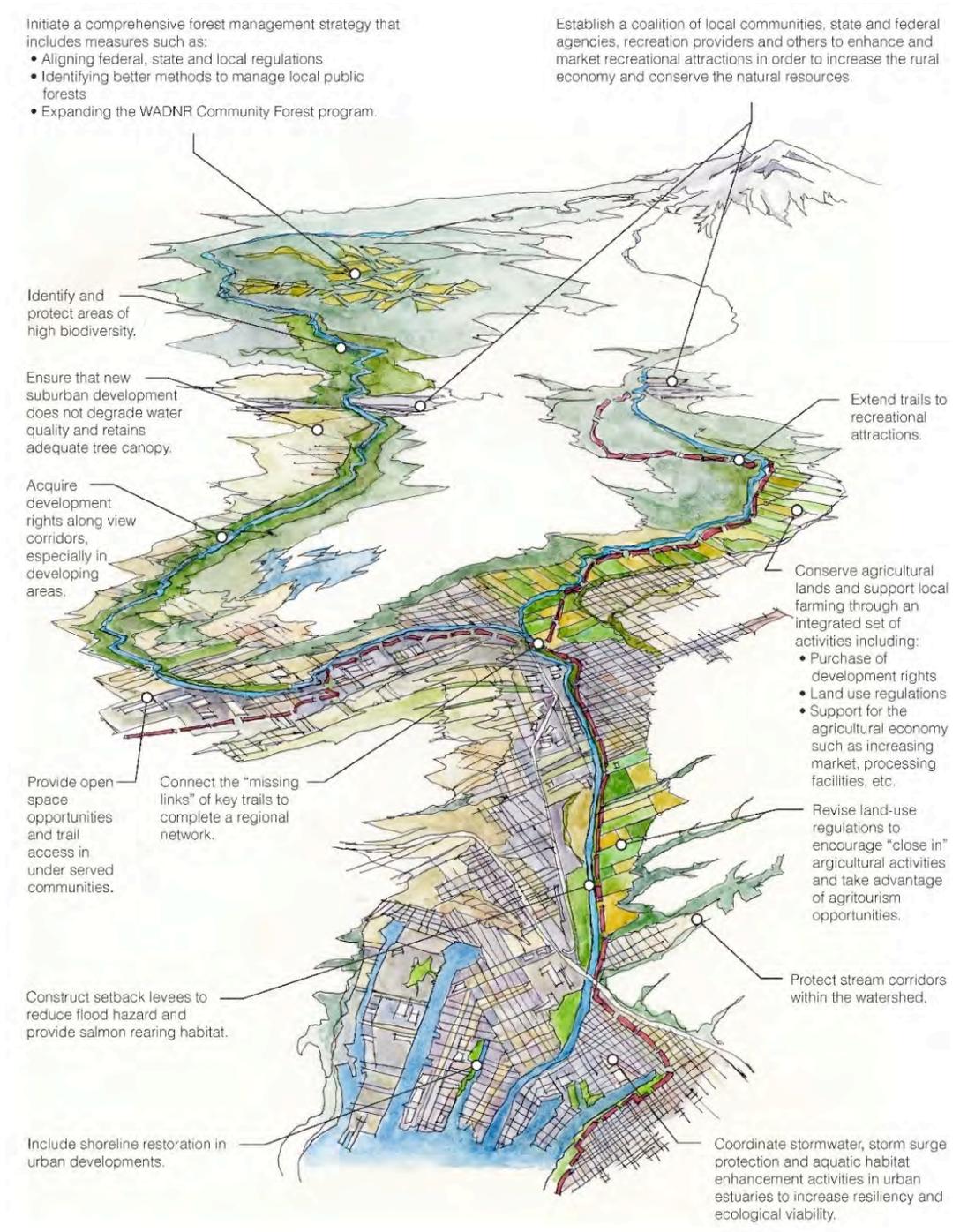
The ROSS team developed these concepts by conducting work sessions and interviews with knowledgeable people working in applicable fields, integrating and building upon knowledge and input gained through the WOSS processes. Although the team worked hard to incorporate available data and include existing open space efforts, the process was not exhaustive. It did not include original research or extensive analysis. Nor are all of the concepts sufficiently detailed to initiate immediate action. Additional work will be needed to identify whether these concepts rise to the level of high priority, how much they might cost, how to obtain funding, and organizational activities necessary for implementation. Therefore, this initial ROSS Sketch should be considered a preliminary first step to initiate conversation toward a more involved, spatialized regional vision. In reality, any physical strategy is a “living document” to be revised as analyses are completed, funding is obtained, projects completed, and new opportunities or challenges emerge.

To facilitate discussion, the individual concepts are organized into six elements:

- | | |
|----------------------------|--|
| 1) Aquatic Systems, | 4) Forest Resources, |
| 2) Biodiversity Resources, | 5) Trails, and |
| 3) Agricultural Lands, | 6) Community and Economic Development Opportunities. |

Some of the concepts are proposals for specific open space acquisition or enhancement projects; others advocate for regulatory, programmatic, or institutional measures to better protect and sustainably use resources such as forest and agricultural lands. Still other concepts address the need for better coordination or research on a given topic. Many of the measures have already been planned or are currently underway. As noted earlier, a key ROSS objective is to support and help coordinate existing open space related projects. They are included here to acknowledge their regional importance and to explore possible connections to other projects.

Linking Activities in a Watershed



Open space systems tend to be geographically oriented to specific watersheds and focus on river corridors. This drawing illustrates how multiple actions can be coordinated to create a robust, connected, multi-functional open space system.

The concepts listed in this section meet the criteria for “regional significance” according to the criteria below:

- The concepts are sufficiently costly or complex that they require funding from outside local means; or
- They require interjurisdictional collaboration.

Additionally they:

- Provide a significant regional benefit; or
- Provide a model for other projects in the region.

There are other very important open space elements not included in this list because they were not immediately seen to have a regional benefit, or are a part of a broader effort. Further, there may be projects or programs that merit regional attention that are absent from this list because of the team’s limited methodology.

As cursory as the strategy outlined in this section is, it is intended to accomplish the following:

- Paint a visual picture of the landscape-scale activities needed to maintain the open space network that we depend on and enjoy;
- Provide a physical picture or example of the kind of opportunities and challenges the region faces in terms of protecting its ecology, livability, and economic viability;
- Provide an initial set of projects that can be evaluated for their relative open space services;
- Establish a baseline for further review and refinement.

The ROSS considers the watershed as the fundamental geographic unit for study because aquatic systems are crucial to the region’s ecology, and many of our human activities are dependent on shorelines, estuaries, river valleys, and other water bodies. But the ROSS team also recognizes that issues and public policy objectives, including regional planning and actions, span watershed boundaries, which is why information from the watershed units needs to be combined and woven together into a regional strategy.

This section also includes an examination of the way the individual concepts relate to one another geographically. One of the most important conclusions from this analysis is that many of the concepts tend to cluster in specific areas, most notably along river corridors. This leads to the notion that additional benefits and efficiencies can be achieved by coordinating proximate measures in a set of “geographically linked strategies.” This concept is explored at the end of this section.

The ROSS Sketch

Aquatic Systems



The region's water bodies are an important recreational resource.

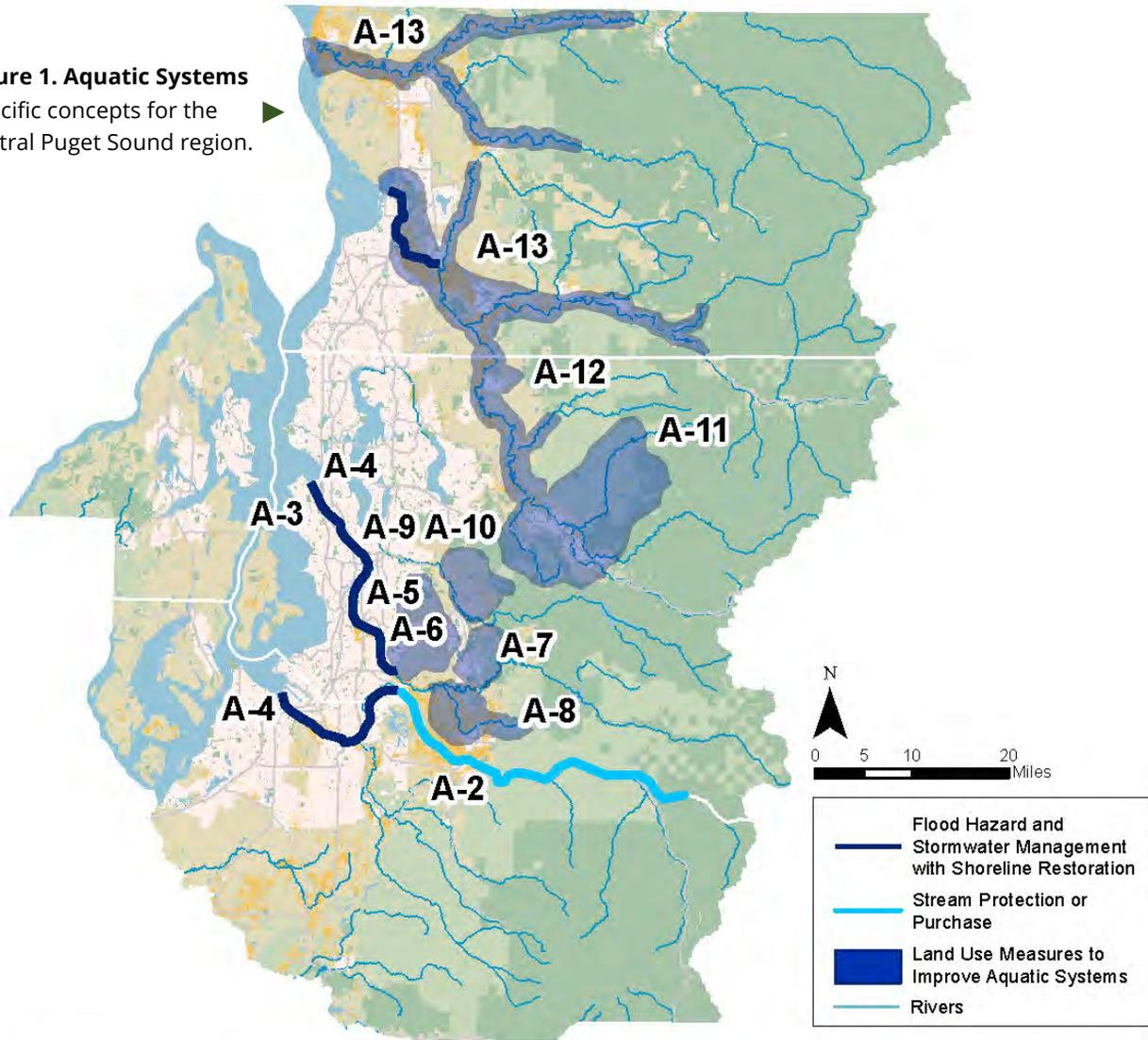
Aquatic systems include water bodies, and storm and ground water, as well as their physical processes such as delivery and transport of water, sediment, nutrients, and large wood. This system is a critical cornerstone of the Puget Sound's natural ecology and community sustainability. This is due to the functions such as habitat, flood hazard reduction, recreation, and water supply that the systems provide. Aquatic systems are also particularly vulnerable to alteration and impacts because both their natural processes and habitat functions depend on the continuity of the water body systems and their uplands. That is, alterations to one part of the system, such as the watershed's forested uplands, can impact other parts of the ecosystem, including floodplains and marine habitats. For this reason, protection or enhancement of a local river corridor, wetland, or marine nearshore can have a watershed-wide or regional benefit, especially if one considers the depressed levels of many marine species in Puget Sound waters. The actions to protect and improve aquatic systems proposed in this strategy focus on special opportunities that could significantly upgrade conditions within the entire riverine/marine shoreline ecosystem.



Salmon and other aquatic organisms depend upon the quality and quantity of fresh and marine waters.

The health of rivers, streams, lakes, and marine waters depends on the conditions and uses of the uplands and the quality and quantity of the stormwater run-off those lands produce. Many river stretches are flanked by productive farm land with productive agricultural activities. While some agricultural activities such as livestock or application of chemicals too close to the shoreline can cause harm to aquatic systems, farming and ranching as a land use is much less destructive to aquatic functions and habitats than most types of residential or urban development. Further, retention of agricultural lands is an objective in its own right, i.e, because they provide the region with fresh, locally produced food. Therefore, concepts to retain agricultural land, especially with sustainable practices compatible with shoreline management, are very important to the quality of aquatic systems. (See concepts AG-1, AG-4, and AG-6). In the same way, recommendations for forest practices also support the protection and enhancement of aquatic systems and biodiversity.

Figure 1. Aquatic Systems
 Specific concepts for the central Puget Sound region.



KEY TO IDENTIFIED ACTIONS

A-1: Construct setback levees with shoreline restoration in lower Puyallup.

A-2: Protect the White River Corridor

A-3: Coordinate shoreline restoration projects on the Duwamish and Lower Green River.

A-4: Coordinate stormwater management, flood surge protection and environmental enhancement efforts in the Duwamish and Lower Green Rivers.

A-5: Restore Green River while upgrading levees in the Kent Valley.

A-6: Take land use and environmental management steps to protect water quality and habitat in the Soos Creek basin.

A-7: Address development impacts to water quality around Black Diamond.

A-8: Work with farmers in the Newaukum Creek basin to identify watershed friendly field drainage techniques.

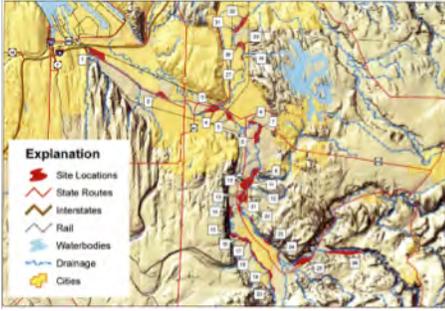
A-9: Restore the lower Cedar River shoreline.

A-10: Take land use steps in uplands to maintain high water quality along the Cedar River.

A-11: Snoqualmie Basin – Manage for fish habitat and flood control

A-12: Cascade Valley Heritage Corridor – Manage for fish habitat and flood control.

A-13: Negotiate land use measures to provide habitat and productive farm land.



Snohomish County has planned setback levees to reduce flood hazard and enhance environmental quality.



Fishing on the Duwamish is a popular activity and dependent on good water quality - which in turn depends on the health of the larger watershed.



The Cedar River has been channelized through downtown Renton and the industrial area. Restoring a more natural shoreline would greatly enhance the river's ecological functions.

Specific recommendations include:

- A-1: Construct setback levees with shoreline restoration in the lower Puyallup. Plans are already in place to initiate this effort, which merits the necessary funding.
- A-2: Protect the White River Corridor through acquisition of key shoreline properties. The White River supports an important spring Chinook salmon run.
- A-3: Coordinate shoreline restoration projects on the Duwamish and Lower Green River.
- A-4: Coordinate stormwater management, flood surge protection and environmental enhancement efforts in the Duwamish and Lower Green Rivers. These actions are important for climate change adaptation and sustainable industrial development.
- A-5: Restore the Green River while upgrading levees in the Kent Valley.
- A-6: Take land use and environmental management steps to protect water quality and habitat in the Soos Creek basin.
- A-7: Address development impacts to water quality around Black Diamond.
- A-8: Work with farmers in the Newaukum Creek basin to identify watershed-friendly field drainage techniques. Such measures would decrease water temperatures in the river, an important ecological objective
- A-9: Restore the lower Cedar River shoreline, especially on publicly owned land and where possible, near industrial areas near the river mouth.
- A-10: Take land use steps in uplands to maintain high water quality along the Cedar River.
- A-11: Support the Mountains to Sound Greenway/multi-organizational group working to manage the Snoqualmie Basin for fish habitat and flood control as well as recreational activities.
- A-12: Manage for fish habitat and flood control in the Cascade Valleys Heritage Corridor.
- A-13: Pursue land use measures, shoreline restoration and sustainable agricultural practices to provide both habitat and productive farm land. Some work has been accomplished on "fish and farmland" issues which could benefit from regional perspectives and resources.



▲
The Pierce County Biodiversity Alliance is working to protect and enhance critical habitats.



▲
There are small areas in south King County with exceptional biodiversity assets.

Biodiversity

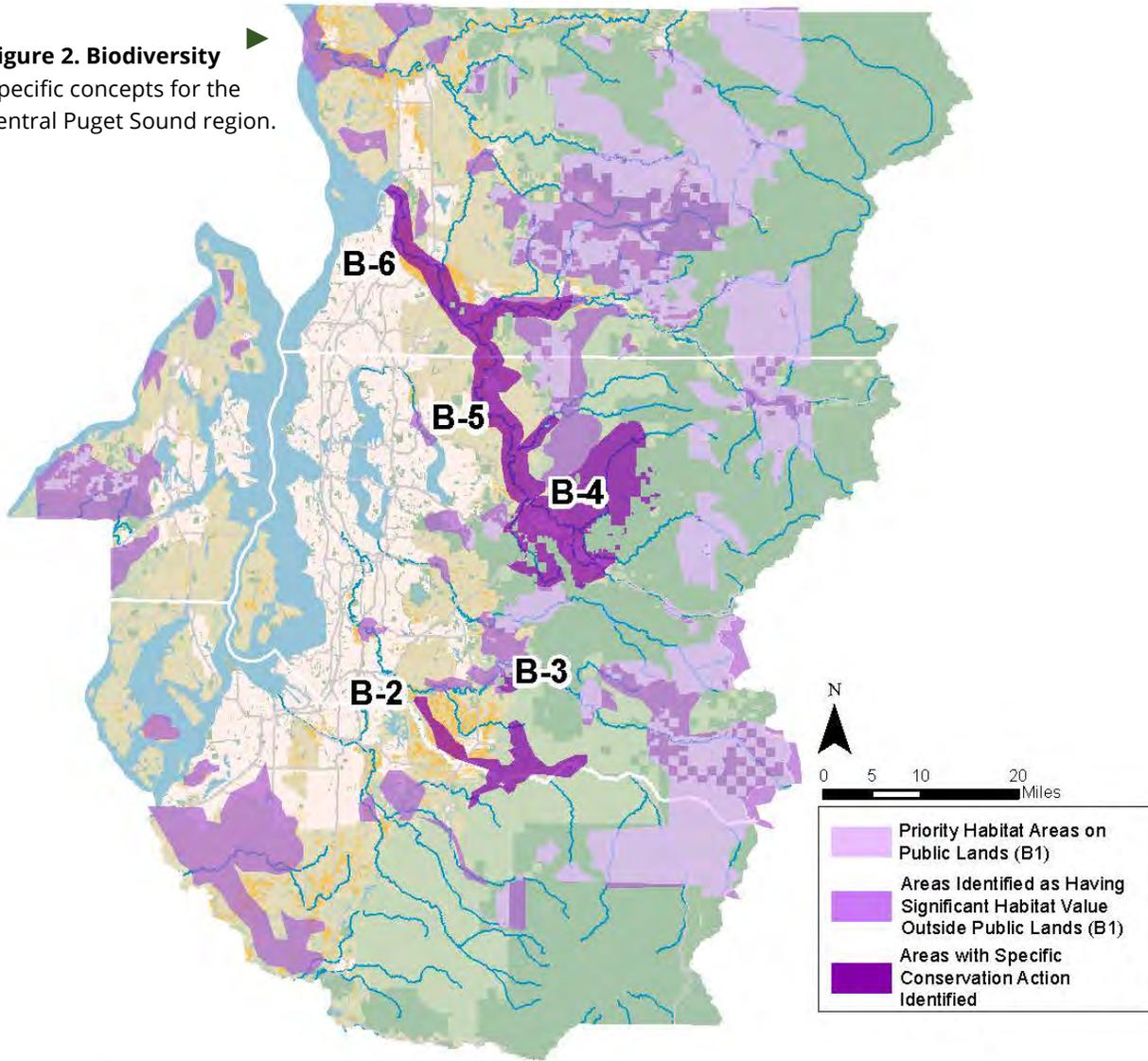
Biodiversity is the amount of variety in the number of species within a given area. When seen from the air or on an aerial photograph much of what appears dark green in the eastern part of the region are not necessarily the types of Puget Sound habitats that provide for healthy biodiversity. In reality, there is only a small fringe of quality habitat remaining, mostly in the lowlands, so protection of this last bit of the region's ecological legacy is critical.

Several organizations are already working hard to conserve this last fringe of lowland habitat and connect it to near-by tracts. For example, the Pierce County Biodiversity Alliance (PCBA), an organization of governments, agencies, academic, non-profit organizations, and interested citizens, has prepared the Pierce County Biodiversity Network Assessment. The assessment identifies areas of high biodiversity resources called Biodiversity Management Areas. The PCBA has also prepared Biodiversity Management Plans for the Lower White River and Crescent Valley. On a much broader scale, The Nature Conservancy has identified a set of threatened high value habitats in their Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, and focuses their efforts on those priorities (Floberg, 2004). Forterra and Kitsap County are working to protect and manage high value forests in the Forest and Bay project on the Kitsap Peninsula, and there are numerous other local efforts. These plans document the biodiversity resources, threats to their viability, and recommendations to conserve them. As noted earlier, the priorities in this ROSS Sketch are based on incomplete information and without quantitative analysis; the list of actions below provides a starting point for biodiversity conservation work.

Specific recommendations include:

- B-1: Initiate a region-wide update/synthesis of existing biodiversity assessments to identify the most ecologically important areas, the relative threats to each, and the priority actions. The Trust for Public Land's Open Space Benefits Assessment Tool can be a start in that effort.
- B-2: Support the Pierce County Biodiversity Alliance efforts to implement the Lower White River Biodiversity Management Area Stewardship Plan.
- B-3: Support King County's efforts to acquire and manage the Bass Lake complex, a small but important biodiversity "hot spot".
- B-4: Establish wildlife corridors and fish habitat restoration in key southern Snoqualmie River reaches.
- B-5: Pursue biodiversity objectives in the Cascade Valleys Heritage Corridor.
- B-6: Work with land owners to protect critical riparian habitat protection in the Snoqualmie and Snohomish River basins. These areas also support broader plant and animal communities.

Figure 2. Biodiversity
 Specific concepts for the
 central Puget Sound region.



LEGEND

B-1: Initiate a region-wide update/synthesis of existing biodiversity assessments to identify the most ecologically important areas, the relative threat to each, and the priority actions.

B-2: Support the Pierce County Biodiversity Alliance efforts to implement the Lowe White River Biodiversity Management Area Stewardship Plan.

B-3: Support King County’s efforts to acquire and manage the Bass Lake complex.

B-4: Snoqualmie Basin – Establish wildlife corridors and fish habitat restoration.

B-5: Pursue biodiversity objectives in the Cascade Valleys Heritage Corridor

B-6: Protect critical riparian habitat

Agricultural Lands

Agricultural lands provide much more than food. Properly managed agricultural lands can also help to mitigate flood damage, improve water quality, support aquatic habitats, provide scenic and recreational opportunities, and contribute to our regional economy. In his book, “Saving Puget Sound: A Strategy for the 21st Century,” John Lombard stated: “The continuing loss of prime farmland is probably the worst land use trend for the region’s major ecosystems.” In addition to its ecological value, Lombard (2006) notes “agriculture is one of the Puget Sound’s larger business sectors, with nearly \$1 billion in annual sales.”

Based on conversations with those actively involved in farmland preservation, it appears that there are three types of conservation activities:

- Local activities to protect specific parcels of land;
- County-wide and regional efforts to protect farmland through land use regulations and programs such as transfer or purchase of development rights, etc.; and
- Efforts to enhance the economic viability of agricultural activities, such as increasing markets for local agricultural product or creating payments for the ecosystem services (PES) they provide.

And yet, the region is still losing farmland at a substantial rate. Efforts should be redoubled and resourced. (See also ROSS report on conversion in Appendix G.) The concepts below are those mentioned in the work sessions and interviews dealing with agricultural lands.

Specific recommendations include:

- AG-1: Initiate an integrated effort to protect critical Stillaguamish, Snohomish and Snoqualmie Valleys for flood, farm, and fish habitat.
- AG-2: Pursue land use regulations to protect small agricultural tracts and encourage agritourism.
- AG-3: Take immediate action to protect remaining agricultural land in the lower Puyallup Valley.
- AG-4: Work with farmers in the Newaukum Creek basin to identify watershed friendly field drainage techniques.
- AG-5: Initiate a comprehensive multi-county sustainable agriculture strategy.
- AG-6: Initiate a comprehensive agricultural lands and aquatic systems enhancement program. There are several perceived conflicts between agricultural land and aquatic habitat objectives that could be more efficiently addressed at the regional scale and implemented at the local level.



A farm in the Snohomish Watershed.

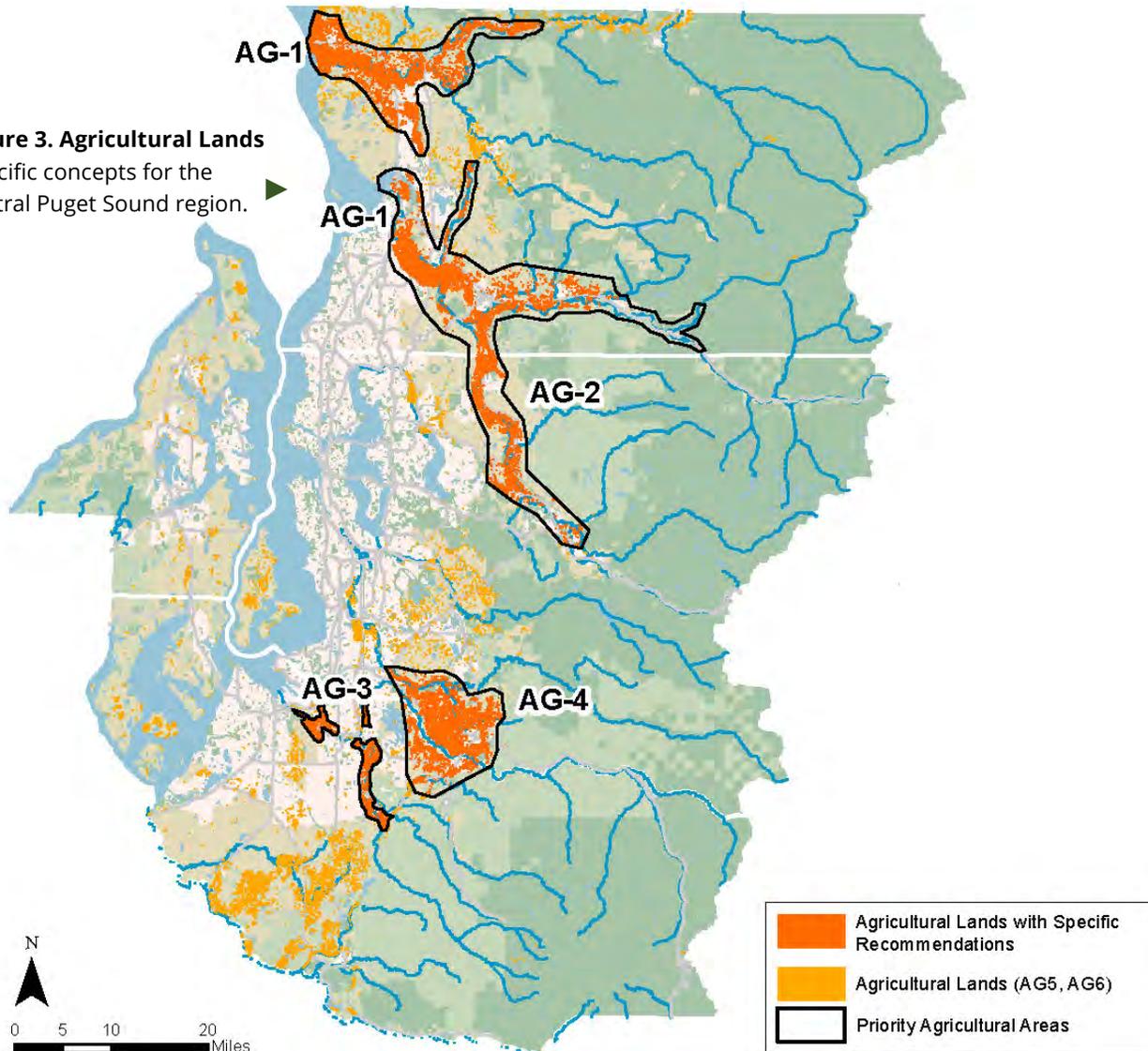


Farming remains viable in the lower Puyallup Valley



Agritourism can help small farms remain viable.

Figure 3. Agricultural Lands
Specific concepts for the
central Puget Sound region.



KEY TO IDENTIFIED ACTIONS

AG-1: Initiate and integrated effort to protect rural valleys for food, farm, and fish protections.

AG-2: Pursue land use regulations to protect small agricultural tracts and encourage agritourism.

AG-3: Take immediate action to protect remaining agricultural land in the lower Puyallup Valley.

AG-4: Work with farmers in the Newaukum Creek basin to identify watershed friendly field drainage techniques.

AG-5: Initiate a Comprehensive multi-county sustainable agriculture strategy.

AG-6: Initiate a comprehensive agricultural lands and aquatic systems enhancement program.



Managing forests in parks such as North Kitsap Heritage Park can be challenging so new tools are needed.



Healthy forests provide critical ecosystem services and are necessary for the vitality of the whole watershed

Forest Resources

The central Puget Sound region benefits substantially from its rich and widely distributed forestlands. While historically valued primarily for the timber produced on these lands, there is now increasing recognition of their value as a carbon sink and as a producer of non-timber economic benefits and critical ecosystem services that foster resilience and support sustainability in the fast-growing metropolitan region.

These forested lands include extensive areas of national forest and national park lands in the upper portions of the river basins, state lands managed by the Department of Natural Resources (DNR), private industrial and non-industrial rural forest lands; tribal lands, parks and other protected areas administered by state, county and city governments; and the urban forest canopy distributed across the developed portions of the region and controlled by public agencies, utilities, private corporations, and individual landowners. While much of the region's forests are in public ownership, about 40% is privately held. Of that, approximately half is owned by industrial corporations with the rest in smaller holdings of less than 1,000 acres. A major concern is that some corporate land holders harvest large tracts and then sell the property for non-resource use, resulting in reduced emphasis on long term resource sustainability and the vital ecological services that forests provide.

Serious efforts are needed to stem the loss of forest cover, restore the ecological integrity of damaged areas, accurately account for forest-related green infrastructure benefits, and ensure that commercial forest harvest practices meet the highest environmental standards.

Like proposals for conserving agricultural lands, those for forest resources include both wide, programmatic and regulatory measures and area-specific efforts. (See also ROSS study on conversion in Appendix G). Those listed below have been identified in this process.

Specific recommendations include:

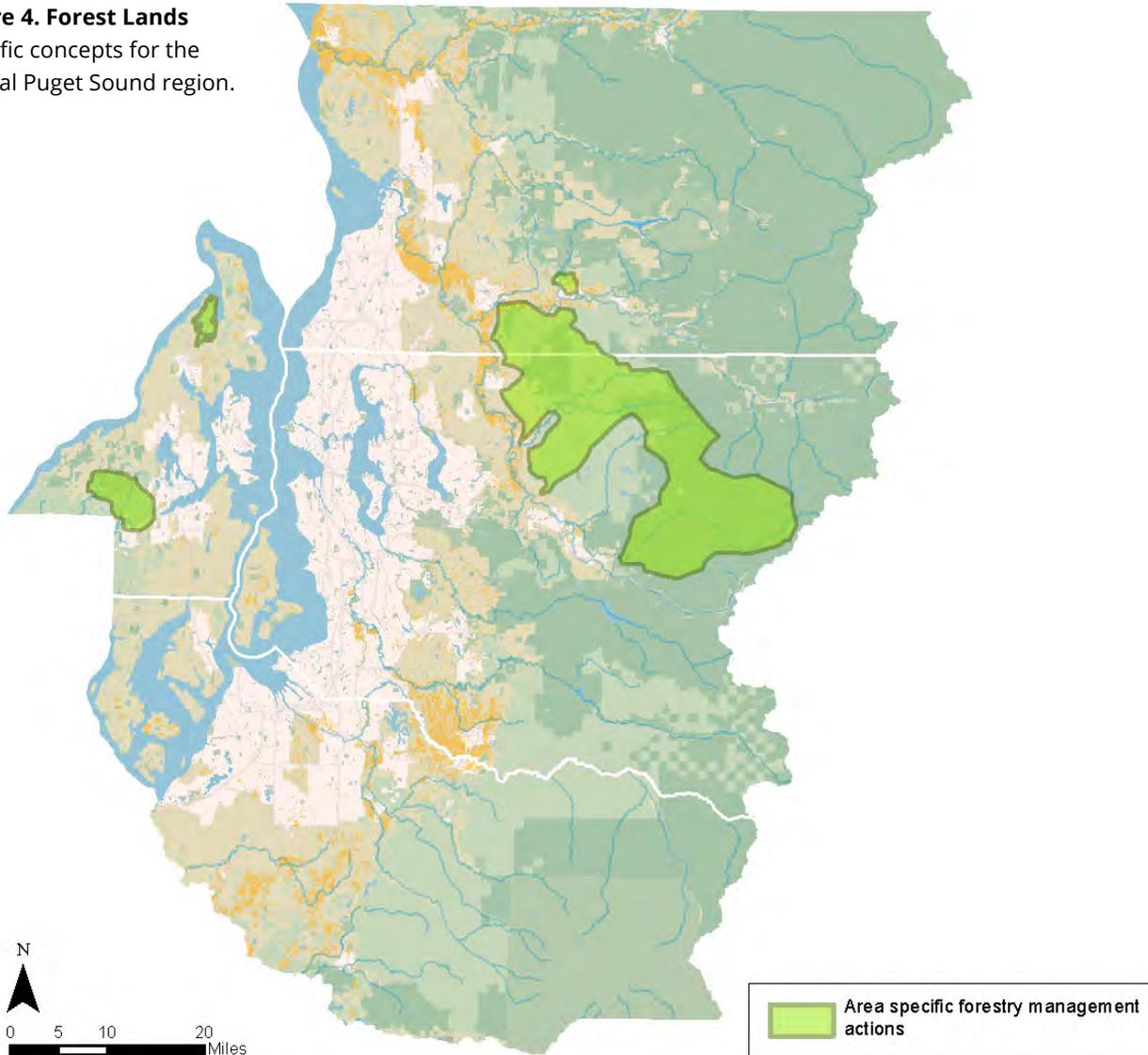
- F-1: Gain public recognition of the important role national forests play in supporting the region's sustainability. Include US Forest Service personnel in regional or basin-wide planning initiatives. Forest and watershed restoration efforts on the part of the Forest Service should be supported, including efforts to address the unfortunate legacy of abandoned and damaging logging roads.
- F-2: The Department of Natural Resources should consider managing its lands within the four-county region to the highest global standards of sustainability, and should create financial or other incentives for private industrial and non-industrial landowners to follow its lead.



Urban forests also provide important services and should be appropriately managed.

- F-3: Initiate and support significant public and private efforts to prevent further conversion of forest land to urban uses, including regulatory measures, acquisition in-fee of at-risk forested parcels, or purchase of permanent conservation easements. Efforts on the part of non-profit organizations to assist small timber landowners with Forest Stewardship Council certification and access to carbon-offset revenues deserve support.
- F-4: Study the opportunity to establish “Community Forests” on land that may be identified by transfer exchange by DNR. Work with DNR, the Forestry Round Table and local communities to address the issues related to the conversion of DNR land to local public ownership and management. The first step would be to identify a path forward for implementing a pilot project. The map indicates a large area of applicability, but the effort would be directed to much smaller scale forest tracts.
- F-5: Provide technical assistance regarding non-commercial forest restoration techniques suitable for use by local governments on unimproved public land. Management of public forest primarily for recreation, sustainability, and ecological purposes can be challenging for municipalities and counties so new techniques are needed.
- F-6: Initiate a comprehensive forest management strategy for small tract forested lands in Kitsap County to serve as a model for other areas. This proposal is intended to develop new techniques in forest practices specifically useful in rural areas rather than in areas with large tracts of undeveloped land.
- F-7: Place priority on stemming the alarming loss of urban forest cover throughout the central Puget Sound region. Counties and municipalities should make every effort to conserve the existing forest canopy under their control, while taking aggressive steps to ensure valuable urban forest assets under private ownership are likewise conserved to the extent possible. The Urban Forest Carbon Registry now under development will offer a significant financial incentive to aid in addressing this critical need. It may be cost effective for several smaller municipalities to combine resources and establish or contract for a multi-jurisdictional urban forest management team with an arborist and specialized tree maintenance capabilities.

Figure 4. Forest Lands
Specific concepts for the central Puget Sound region.



KEY TO IDENTIFIED ACTIONS

F-1: Gain public recognition of the important role national forests play in supporting the region’s sustainability.

F-2: The Department of Natural Resources should consider managing its lands within the four-county region to the highest global standards of sustainability, and should create financial or other incentives for private industrial and non-industrial landowners to follow its lead.

F-3: Initiate and support significant public and private efforts to prevent conversion of forestland to urban use, including regulatory measures, acquisition in fee of at-risk forested parcels, or purchase of permanent conservation easements.

F-4: Study the opportunity to establish “Community Forests”

F-5: Provide technical assistance regarding non-commercial forest restoration techniques suitable for use by local governments on unimproved public land.

F-6: Initiate a comprehensive forest management strategy for small tract forested lands in Kitsap County to serve as a model for other areas.

F-7: Place priority on stemming the alarming loss of urban forest cover throughout the central Puget Sound Region





Connecting the Interurban and Green River Trails to the Foothills Trail with an extension along the Puyallup river would provide an off-road connection between Downtown Seattle and Downtown Tacoma.



Centennial Trail in Snohomish County.



Kitsap County has many fine bicycle routes.

Trails

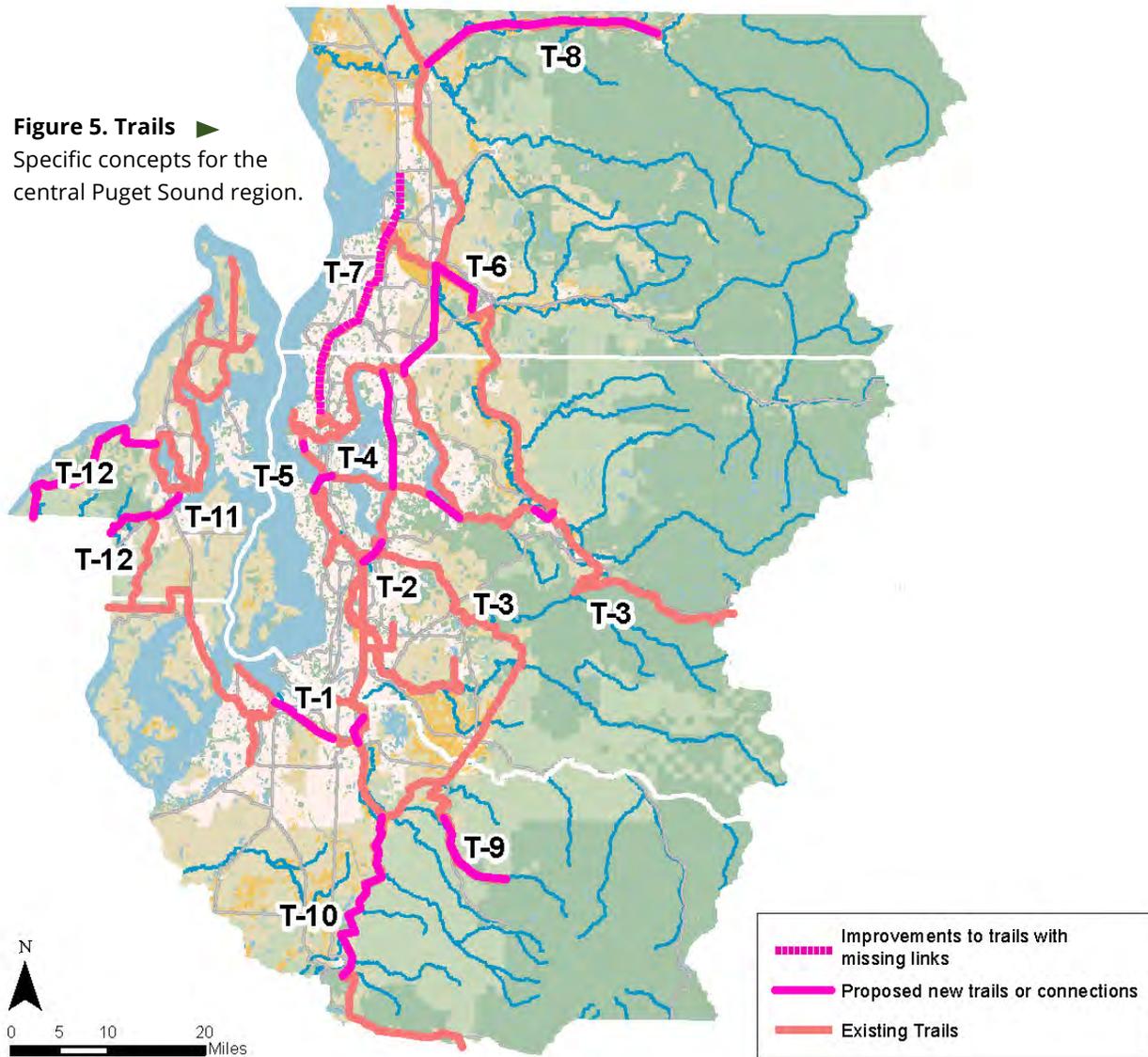
Pedestrian and bicycle trails can contribute benefits that address the pressures of city life – more opportunities for recreation, alternatives to commuting by car, green space that improves air and water quality. Bicycle and walking trails are especially important for public health objectives because they not only provide valuable exercise in their own right, they connect people to other active recreational resources.

Puget Sound already boasts a number of attractive and accessible regional trails. However, there are several key “missing links” that, if constructed, would create a robust regional network connecting all the major cities and population centers with important recreational and scenic attractions. Most of these critical connections will be difficult to achieve and beyond the resources of local municipalities and counties. But, since they will provide a regional benefit, they merit a high priority for funds from a variety of sources. The most important off-road regional multi-purpose trail connections identified in this strategy are listed below. Of course, this regional network should be supported with local trails and non-motorized facilities.

Specific recommendations include:

- T-1: Connect the Interurban Trail and Pierce County Foothills Trail to create a separated route from Seattle to Tacoma.
- T-2: Connect the Green River Trail, East Lake Washington Trail and the Cedar River Trail in and near Renton to provide a major trail network hub in south King County.
- T-3: Continue constructing the Mountains to Sound Greenway (MTS) Trail across Bellevue.
- T-4: Continue constructing the Eastside Trail to provide this important link.
- T-5: Construct the MTS Greenway missing link around Beacon Hill to connect the MTS trail to the Green River Trail.
- T-6: Connect the Centennial Trail to the Snoqualmie Valley Trail.
- T-7: Complete missing links in the North Interurban Trail to connect Everett and Seattle.
- T-8: Complete the Whitehorse Trail from Arlington to Darrington.
- T-9: Complete the Foothills Trail to Mt. Rainier.
- T-10: Construct Elbe/Alder/Paradise Trail to provide access to several recreation destinations.
- T-11: Pursue multi-use trail connections between Bremerton and Belfair.
- T-12: Construct a mixed-use trail on the water-side of SR3, the north side of Sinclair Inlet connecting trails in Bremerton and Port Orchard.
- T-13: Enhance facilities (put-ins, camping facilities, signage) for the Cascadia Marine Trail, a relatively low cost action that would add amenities and prominence to this unique recreational feature.

Figure 5. Trails ►
Specific concepts for the central Puget Sound region.



KEY TO IDENTIFIED ACTIONS

- | | |
|---|---|
| <p>T-1: Connect Interurban Trail and Pierce Co Foothills Trail.</p> <p>T-2: Connect the Green River Trail, East Lake Washington Trail and the Cedar River Trail near and in Renton.</p> <p>T-3: Construct the MTS Greenway missing link around Beacor Hill and industrial area</p> <p>T-4: Continue constructing the Eastside Trail.</p> <p>T-5: Construct the MTS Greenway missing link around Beacor Hill and industrial area.</p> <p>T-6: Connect the Centennial Trail to the Snoqualmie Valley Trail.</p> <p>T-7: Complete missing links in the North Interurban Trail to connect Everett and Seattle.</p> | <p>T-8: Complete Whitehorse Trail from Arlington to Darrington.</p> <p>T-9: Connect Foothills Trail to Mt. Rainier.</p> <p>T-10: Construct Elbe/Alder/Paradise Trail</p> <p>T-11: Pursue multi-use trail connections between Bremerton and Belfair</p> <p>T-12: Construct a mixed-use trail on the water side of SR3, the north side of Sinclair Inlet connecting trails in Bremerton and Port Orchard.</p> <p>T-13: Enhance facilities (put-ins, camping facilities, signage, etc.) for the Cascadia Marine Trail.</p> |
|---|---|



Parks and open spaces can provide an important community development incentive. The Bitter Lake Park and Community Center contributes to the county's health and has also spurred positive development along the Aurora transit corridor. A comprehensive plan for developing parks along key underserved urban corridors could reduce land use inefficiencies and inequities created by current land use patterns.

Community and Economic Development

In addition to providing direct economic benefits through the production of timber and agricultural products, open space supports community and economic development in at least two ways. First, and most obvious, parks and open spaces greatly enhance a community's livability. While this regional open space strategy focuses on efforts that provide a regional benefit, it acknowledges and supports local efforts to enhance parks, trails, shorelines, grassy fields, plazas and other hard-surface open areas, and other open space resources. In addition to increasing livability and improving human health, regionally significant open spaces and recreational resources can provide substantial economic benefits to local communities.

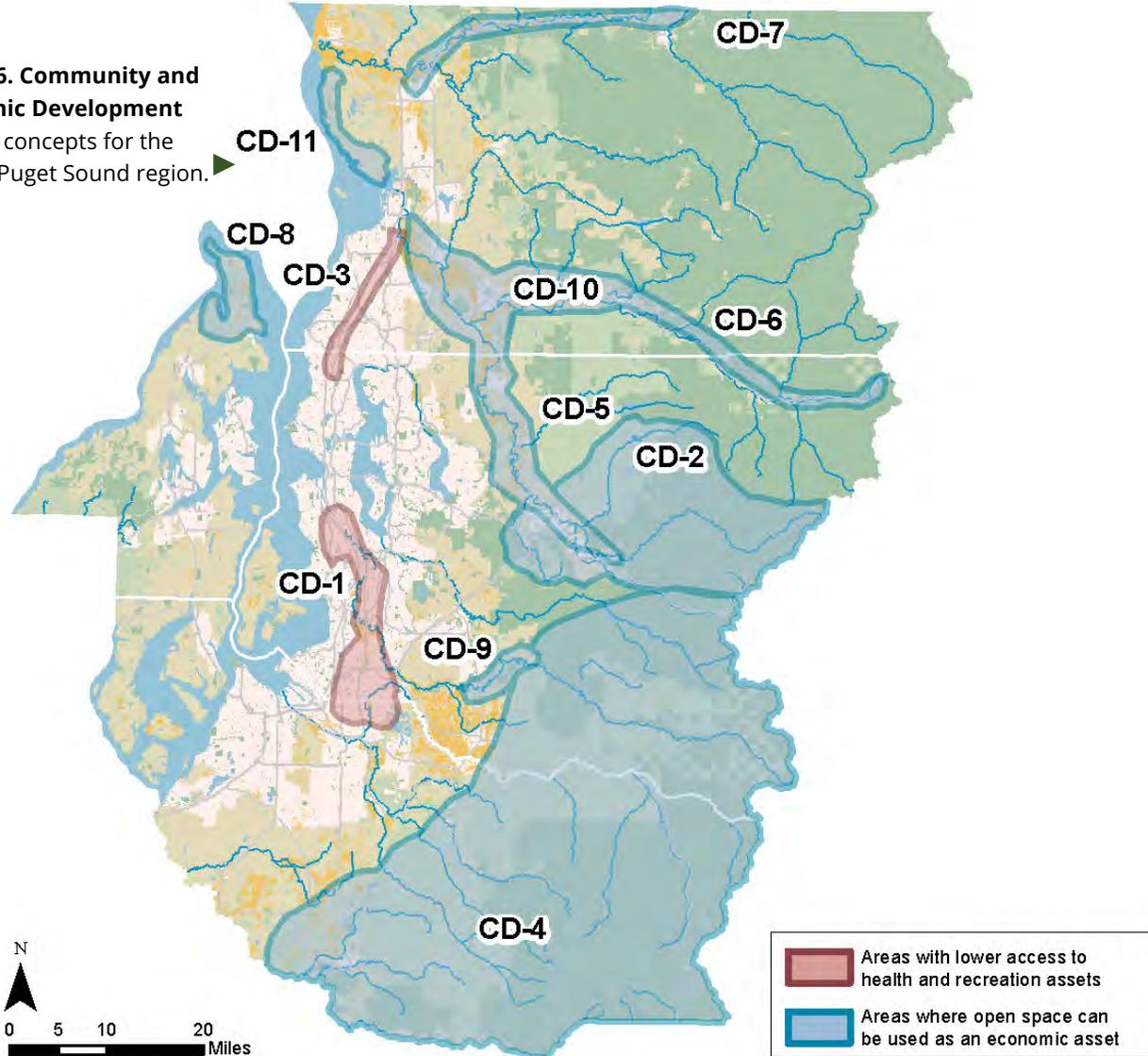
In its 2010 Conservation Economics Study, the Trust for Public Land (TPL) found that active outdoor recreation contributes more than \$8.5 billion in annual retail sales, and about \$650 million in retail tax revenue (TPL, 2010). Statewide, active outdoor recreation supports at least 115,000 jobs. In their November 10, 2013 article in the *Seattle Times* former Congressman Norm Dicks and former Governor Dan Evans noted that for each day Mount Rainier National Park was closed, Washington State lost an average of more than \$90,000 in tourism revenue, a major impact on family businesses in gateway communities in our more rural areas that rely on travel and tourism. A Seattle Chamber of Commerce 2011 survey of its organization's members found that a majority of Puget Sound area businesses ranked our region's quality of life and environmental surroundings as top assets for retaining quality staff (The *Seattle Times*, 2013).

Some of the concepts in this section build on the economic potential found in the region's extensive wild lands and recreational resources, and leverage several other proposals. Others focus on regionally significant areas that lack access to substantial open space resources. Attention to these areas is needed, not only because they would support community development efforts, but also because they could have a significant benefit in terms of public health.

Open space resources can play an important role in addressing equity objectives by increasing the health, livability and social capital of underserved communities. For example, King County has identified neighborhoods with significant health and other social concerns, along with a lack of open space resources. While these can be considered local challenges, their magnitude and interjurisdictional geography make them regionally significant.

Figure 6. Community and Economic Development

Specific concepts for the central Puget Sound region.



KEY TO IDENTIFIED ACTIONS

CD-1: Address the open space deficiencies and health impacts in the lower Green River Valley

CD-2: Support the MTS Greenway efforts to enhance wildlife corridors, local trail connections, and recreation within the Middle For Snoqualmie River Valley and to expand the designated National Heritage Site.

CD-3: Provide community open spaces near the Highway 99 corridor in Snohomish County.

CD-4: Establish a “Greater Rainer” Coalition

CD-5: Support the MTS Greenway Initiative with the current Snoqualmie Valley Coalition.

CD-6: Utilize the Scenic River Designation along the Skykomish and finalize the Sky to Sound Water Trail.

CD-7: Establish a Stillaguamish Valley coalition to capitalize on recreation assets.

CD-8: Build on the open space resources in the Hansvile/Kingston/Port Gamble vicinity as a regional recreational and scenic amenity with attractions along that corridor.

CD-9: Establish a “Hanging Gardens” Park in the Green River Gorge.

CD-10: Incorporate agriculture and tourism in appropriate ways.

CD-11: Establish more recreational water access opportunities.



A coalition between small towns, private recreation attractions and the National Parks and Forest Services could integrate marketing, economic development and resource management activities to make the area around Mount Rainier an internationally known attraction.

- CD-1: Address the open space deficiencies and health impacts in the lower Green River Valley. Communities in this area are heavily impacted with health, income, and other social challenges. Open space enhancements might be part of a larger effort to address social issues in this area.
- CD-2: Support the MTS Greenway efforts to enhance wildlife corridors, local trail connections, and heightened recreational capacity within the Middle Fork Snoqualmie River Valley and to expand the designated National Heritage Site.
- CD-3: Provide community open spaces near the Highway 99 corridor in Snohomish County.
- CD-4: Establish a "Greater Rainer" Coalition. (See Geographically Linked Strategy LS-2.)
- CD-5: Support the Mountains to Sound Greenway initiative with the current Snoqualmie Valley Coalition. (See Geographically Linked Strategy LS-5.)
- CD-6: Utilize the Scenic River Designation along this stretch of the Skykomish and finalize the Sky to Sound water trail. (See Geographically Linked Strategy LS-4.)
- CD-7: Establish a Stillaguamish Valley coalition to capitalize on recreation assets. (See Geographically Linked Strategy LS-7.)
- CD-8: Build on the open space resources in the Hansville/Kingston/Port Gamble vicinity as a regional recreational and scenic amenity with attractions along that corridor. (See Geographically Linked Strategy LS-9.)
- CD-9: Establish a "Hanging Gardens" Park in the Green River Gorge between Flaming Geyser Park and Kanaskat-Palmer State Parks.
- CD-10: Incorporate agriculture and tourism in appropriate ways.
- CD-11: Establish more recreational water access opportunities.

Geographically Linked Strategies

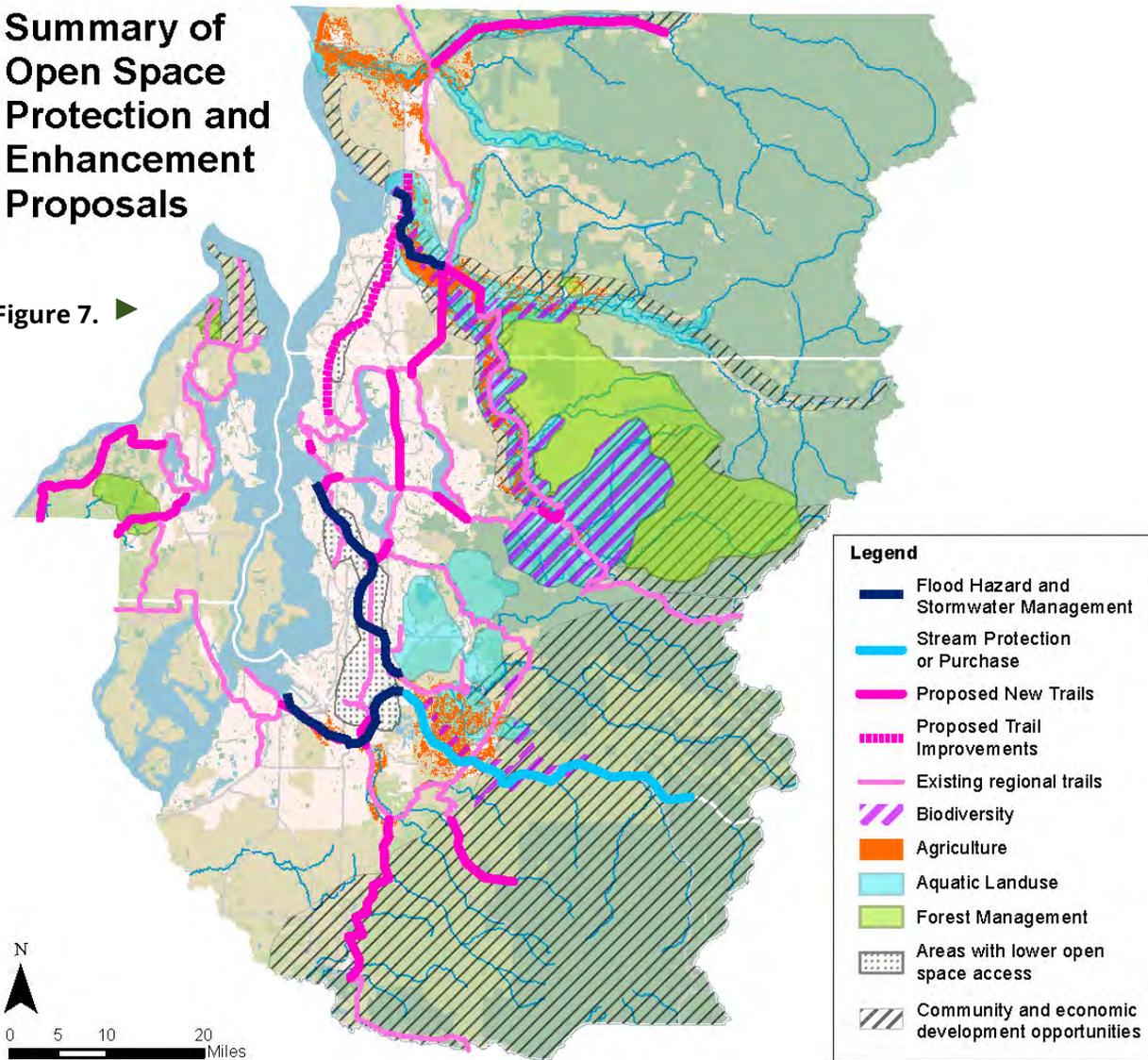
Since a primary goal of the Regional Open Space Strategy is to identify regionally significant opportunities where collective actions could most effectively achieve multiple benefits, identifying the geographic areas where combining open space efforts could realize substantial benefits is critical.

Figure 7 overlays the six open space elements discussed in the previous section of this chapter. From this map diagram, it is clear that most of the proposed regionally significant actions are concentrated in the region's floodplains. This exercise illustrates how critical these river corridors are. They include significant aquatic systems, agricultural lands, biodiversity resources and trail opportunities. They also provide important flood hazard management and water quality functions. These river floodplains, radiating out from Puget Sound through urban lands and rural valleys, to the forested Cascade foothills, are the connective threads holding together the ecological and green infrastructure systems that support our communities. Since they are also the corridors through which our roads and trails pass and include many of our recreational attractions, these corridors connect urban communities with rural and wilderness areas, giving the region a sense of being a "constellation" of cities within a park. These river corridors begin to lay the foundation for our regional open space vision. This fundamental geographic structure can be envisioned as a wheel, with Puget Sound comprising the hub, the Cascades and Olympics acting as the rim, and the river corridors with their fertile valleys serving as the wheel's spokes. Weaken the spokes through unwise development or neglectful environmental management, the whole system is vulnerable to collapse.

In addition to the river corridors, there are other areas where collective inter-objective actions would provide important benefits. For example, in North Kitsap and around Mount Rainier National Park forest protection, recreation enhancement and trail improvement measures could provide significant economic, as well as environmental, benefits. There are also urban areas in the region where health impacted communities lack recreation and active living facilities necessitating a regional response to the growing inequities.

Summary of Open Space Protection and Enhancement Proposals

Figure 7. ►



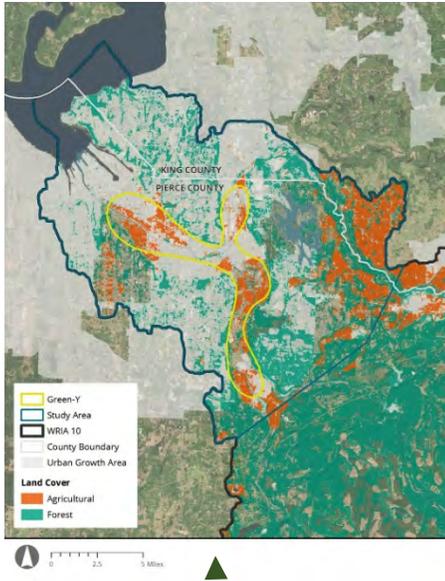
Combined Strategies with Multiple Benefits



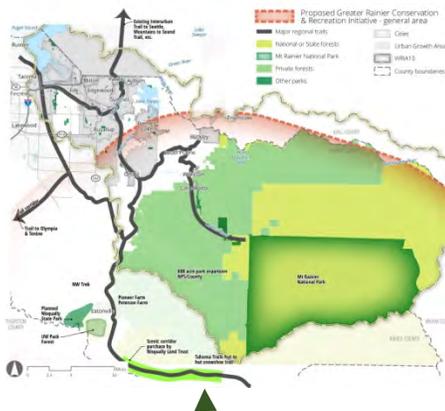
Figure 8 translates the patterns of the overlay map into a diagram of geographically linked strategies where combining a number of open space protection/enhancement efforts would be particularly valuable and result in regionally significant benefits. These geographically linked strategies are summarized below. The brief descriptions and map depictions are very preliminary and not adequately detailed or analyzed, but begin to sketch out a framework for what a regional vision graphically represented might look like. Some of the concepts are aspirational, while others are already ongoing or being initiated. Some point to relatively specific actions, while others are not well defined. The primary intent of this map is to illustrate the types of regionally-scaled opportunities and challenges that need to be further explored. The key to their success will be to provide the resources and organizational coordination that such large scale efforts require – and merit.

Geographically Linked Strategies where coordinated actions could achieve substantial multiple benefits

- | | |
|---|---|
| <ul style="list-style-type: none"> Enhance the “Green “Y” to create an open space oasis in the heart of urbanizing Pierce County. Protect the ecologically valuable White River corridor. Establish the Greater Rainier Coalition to enhance recreation opportunities, ecosystem resiliency and the local economy. Enhance the Snohomish River rural corridor with a combination of aquatic and agriculture conservation measures and trail connections. Increase recreation opportunities on the Skykomish Scenic River Corridor. Build on current conservation work in the Snoqualmie Valley. | <ul style="list-style-type: none"> Transform the Middle Fork Snoqualmie River Corridor into an accessible recreation and ecological treasure. Connect assets within the Stillaguamish Basin and Recreation Corridor. Develop a green infrastructure strategy for the Green Duwamish River watershed. Create an important recreation destination in scenic North Kitsap. |
|---|---|



The Green Y location and current land cover.



Recreation, environmental protection and economic development activities around Mount Rainier can be coordinated for maximum benefit.

LS-1 Pierce County Green-Y – An unparalleled opportunity to create multi-functional open space in the heart of urbanizing Pierce County.

This multi-faceted effort would reduce flood hazard, enhance aquatic habitat, complete an off-road multi-purpose trail from Tacoma to Seattle and beyond, protect near-city farms (ideal for family outings as well as food production), and provide recreational opportunities for disadvantaged communities. Together, these actions would establish an open space focus in the very heart of Pierce County’s urban fabric and give a more defined identity to those municipalities that surround it.

Actions in this focus area include:

- Construct setback levees on the Puyallup and White Rivers that provide flood storage and valuable intertidal salmon habitat.
- Undertake, and in some cases continue, several agricultural land conservation measures.
- Link the Pierce County Foothills Trail System with King County’s Interurban Trail to provide a continuous multi-purpose trail between Tacoma, Seattle and other points to the north.
- Establish land use regulations to enhance the area’s rural functions and qualities. (See also ROSS report on conversion in Appendix D.)
- Protect the upstream portion of the White River corridor by acquiring development rights of lands fronting the shoreline to create a forested corridor of adequate width.

LS-2 Greater Rainier Coalition – Collaboration between parks systems, forest managers, local communities, and outdoor recreation attractions to enhance recreation opportunities, ecosystem resiliency, and the local economy.

Visitors to Mount Rainier National Park already contribute more than \$90,000 per day to the local economy. There are also numerous existing and planned destination recreation attractions near-by. If the area’s natural ecology is conserved and public and private recreational development and conservation activities can be coordinated, there is an opportunity to create an internationally renowned recreational destination where visitors spend 2 or more days instead of an afternoon, dramatically increasing economic and community development benefits. There is already some coordination between local communities, but coordination and marketing could be greatly increased.

The regionally-based activities that could support this effort include:

- Establish a “Greater Rainier” (or “Mother Mountain”) Coalition to coordinate the environmental and recreational efforts on the west side of Mt Rainier National Park.



Nature study is a popular activity on the Snohomish Estuary.



A flower plot in the Snohomish River Valley.



Off-channel habitat along the Snoqualmie River.

- Complete a Biodiversity Stewardship Plan for the Carbon River.
- Create a multi-purpose trail from the current terminus of the Foothills Trail to the Mount Rainier National Park entrance.
- Support community forest trust efforts through an implementation study.
- Develop a collaborative marketing and recreational development plan.

LS-3 Snohomish River Rural Corridor – A combination of aquatic system enhancements, agricultural land conservation, and trail connections to improve habitat, the agricultural economy, and recreation opportunities.

Lying just east of Everett and urban Snohomish County, the beautiful Snohomish River Valley includes some of the region’s most fertile farmlands. Recent habitat restoration efforts have made the river’s estuary a rich aquatic ecosystem with excellent wildlife viewing opportunities. By connecting existing regional trails, strategically coordinating aquatic habitat improvements with farmland conservation, and adding agritourism opportunities, this rural corridor could become one of the region’s most attractive destinations, and provide critical green infrastructure services.

Actions in this focus area include:

- Revising the land use regulations to encourage agritourism.
- Identifying specific areas for aquatic habitat and flood hazard reduction as well as lands better suited for agriculture.
- Implementing agricultural land conservation measures included in the Snohomish County Sustainable Agriculture Program.

LS-4 The Skykomish Scenic River Corridor – An exceptional recreation opportunity.

The Skykomish is a designated Scenic River and is already a heavily used route for outdoor recreation into and across the Cascades. Currently, the corridor is hampered by the inadequacy of US 2 which often causes long delays on weekends and sometimes results in treacherous conditions. Planned highway improvements could alleviate this constraint and allow the wealth of existing recreation attractions to become more accessible. At the same time, the spectrum of camping, fishing, hiking, cycling, boating, and other forms of outdoor recreation could be increased. The benefits of this increase in recreational activity will certainly be a boon to the small communities along the corridor.

Actions to take advantage of these opportunities include:

- “Leverage” the Skykomish Scenic River Corridor designation and complete the Sky to Sound Water Trail, a project currently being shepherded by Snohomish County.



The Middle Fork of the Snoqualmie River offers excellent recreation opportunities close to urban centers.



Boating is a popular activity on many of the region's rivers.

- Revising the land use regulations to encourage agritourism. The Skykomish corridor includes some attractive farmland, especially between Monroe and Sultan.
- Ensuring that bicycle facilities are included in any US 2 improvements.
- Adding access points and small recreation areas along the corridor.

LS-5 Snoqualmie Valley Coalition – Building on current work to conserve King County’s premier rural valley.

Groups of citizens in the Snoqualmie Valley are already thinking comprehensively, and there is broad coalition in place. Besides the Mountains to Sound Greenway efforts, there is a Snoqualmie Valley Chamber of Commerce that promotes communities and business interests in the upper valley, and the Snoqualmie Watershed Forum is working to implement WRIA 7 Salmon Recovery plans and other water resource conservation objectives. Since the Snoqualmie/Carnation Valley is particularly blessed with active farms, trails, aquatic resources, and scenic amenities, broader, multi-jurisdictional, and multi-objective collaboration would be valuable.

The following activities could be pursued under such a coalition:

- Further support the several agricultural land conservation measures underway.
- Extend the Snoqualmie Valley Trail to fill in gaps and connect to nearby trails and destinations.
- Coordinate promotion of visitors attractions along the whole valley, from Monroe to North Bend
- Bolster recreational capacity to prepare for increasing usage while conserving ecosystem integrity in the publicly owned Middle Fork Snoqualmie Valley.

LS-6 Middle Fork Snoqualmie River Corridor – From a lawless hang-out to an accessible recreation and ecological treasure.

Within a 45-minute drive from Seattle, the Middle Fork of the Snoqualmie River is one of the nation’s most spectacular natural areas close to a population center. Nowhere else in the country does a designated wilderness area come so close to a major metropolitan area. For decades, the area was known as a refuge for lawless activities such as illegal dumping, rampant shooting, and hidden meth labs. But citizens, nonprofits, and public agencies teamed up to take the Middle Fork back for the community. The Washington State Department of Natural Resources’ designated the vicinity as a Natural Resources Conservation Area (NRCA), and a major road improvement project is underway to provide easy recreational access by 2017. The challenge now is to protect and manage the Middle Fork watershed to ensure



The Stillaguamish has many attractive and ecologically valuable tributaries.

sustainable recreation for what will soon be a steeply rising number of visitors, while preserving the values of a pristine Northwest forest ecosystem in the shadow of a booming urban center. The Mountains to Sound Greenway Trust, along with its partners, is actively working to address these needs.

The primary action is to support the MTS Greenway team with the resources necessary to accomplish its recreation and conservation objectives in this area.

LS-7 Stillaguamish Basin and Recreation Corridor – Connecting assets within a beautiful but ecologically fragile valley.

From the expansive agricultural valley at the river’s delta to its legendary steelhead fishing holes and recreation attractions in its upper reaches, the Stillaguamish offers a broad spectrum of ecosystem services. However, the “Stilly” is characterized by high levels of siltation and variable water flows, which are now exacerbated by logging and development, evidenced by the catastrophic Oso land slide. These hydrological problems limit salmon recovery efforts and cause frequent floods, often threatening valley communities. As the river corridor has received less attention than other watersheds, it appears that a comprehensive approach that examines the ecological and economic benefits of open space actions should be explored. While collaborative ecosystem service management opportunities have not been studied as much as in floodplains closer to urban centers, the loss of life and economic hardships caused by the mudslides, road wash-outs and flooding indicate that better management of this watershed is critical. And, more positively, better promotion and access to the area’s attractions would be an economic advantage.

Actions to address these needs include:

- Form a “Stillaguamish Coalition” of local communities, governmental agencies and NGO’s to identify a strategy for better “green infrastructure” management to reduce environmental hazards, improve natural resources and uplift the local economy. Implement the open space related recommendations of the North Stillaguamish Economic redevelopment plan.
- Complete the White Horse multi-purpose trail between Arlington and Darrington parallel to the river and connect it to Snohomish County’s Centennial Trail to provide a direct connection to communities to the south.
- Establish or improve access opportunities along available Port Susan shoreline reaches.
- Initiate land use measures to improve aquatic habitat while conserving productive farm land.
- Address sedimentation and water temperature concerns.



The middle reach of the Green River is currently constrained by levees. New flood hazard reduction measures could both protect human development in the valley and significantly improve the river's ecological value.

LS-8 Green Duwamish River – A crucial ecological and economic asset in need of a watershed-wide green infrastructure strategy.

King County is working on a more coordinated strategy to improve, human health and livability, as well as ecological resiliency throughout the watershed. On the Duwamish/Lower Green River, integrating the numerous habitat restoration projects with healthy community, critical stormwater, flood and storm surge management efforts will increase the valley's environmental and social resiliency. Applying green infrastructure measures in this area could be an economical and environmentally sustainable way to support industrial activities.

While the upper Green River itself is protected by adjacent buffers of publically-owned properties, land uses and development activities have contributed to increasing water temperatures in the waterway that depresses salmon survivability. For this initiative to be successful, upstream land use, improvement in agricultural, and forest management practices will be necessary to maintain permeability, increase shade over tributaries and the mainstream, and improve quantity and quality of stormwater runoff. Additionally, the Duwamish/Lower Green River Valley features communities with some of the lowest health scores and lowest incomes in the county. Providing better recreation and open space services to address some of these inequities has been identified as a priority.

Actions to address these concerns include:

- Coordinate stormwater management, storm surge measures and integrate with the many environmental restoration activities in the Duwamish industrial areas.
- Continue the Green River System-wide Improvement Framework (SWIF), a comprehensive effort to address flood hazard reduction, shoreline restoration and several federal mandates.
- Connect the Cedar River, East Lake Washington and Green River Trails near the Black River trace and downtown Renton.
- Support ecologically sensitive land use and green infrastructure measures to protect aquatic systems in the Soos Creek sub-basin.
- Connect the King County Cedar River Trail and the Pierce County Foothills Trails system.
- Pursue the opportunity of a Hanging Gardens Park in the Gorge between Flaming Geyser and Kanaskat-Palmer State Park.
- Work with farmers in the Newaukum Creek sub-basin to find methods to drain fields in ways that keep the surface water cold and clean.
- Complete the open space and stormwater plan currently being



▲
Kitsap County has many public beaches and amenities.



▲
A working farm in North Kitsap.



▲
The Point No Point Lighthouse and park is a popular destination on North Kitsap

developed by King County.

- Support open space funding being considered by King County.

LS-9 North Kitsap – An especially scenic landscape and potentially an important regional recreation destination.

Forterra’s Kitsap Forest & Bay project is working to protect 6,700 acres of forests and shorelines around Port Gamble Bay and on the North Kitsap Peninsula. Adding land use protections, rural design guidelines, trails, and other recreational opportunities would make northern Kitsap a premier attraction of regional, if not national, importance.

Current efforts and proposed actions include:

- Providing regional support to the Kitsap Forest and Bay project including acquisition and conservation of the North Kitsap Heritage Park, Port Gamble Forest and Hansville Forest.
- Establishing trail connections that will provide critical links in a cross Washington multi-use trail.
- Identify strategies to manage and maintain recently acquired public forest lands.
- Establish land use and rural design measures to protect scenic corridors in the area.





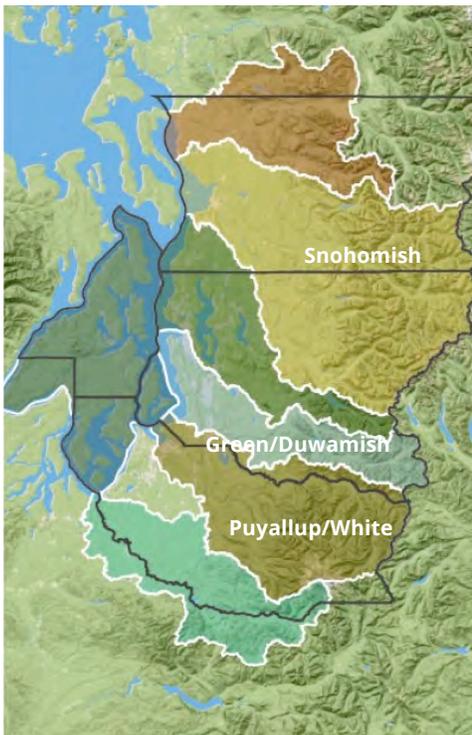
Chapter 5

Analytical Tools

CHAPTER 5: ANALYTICAL TOOLS

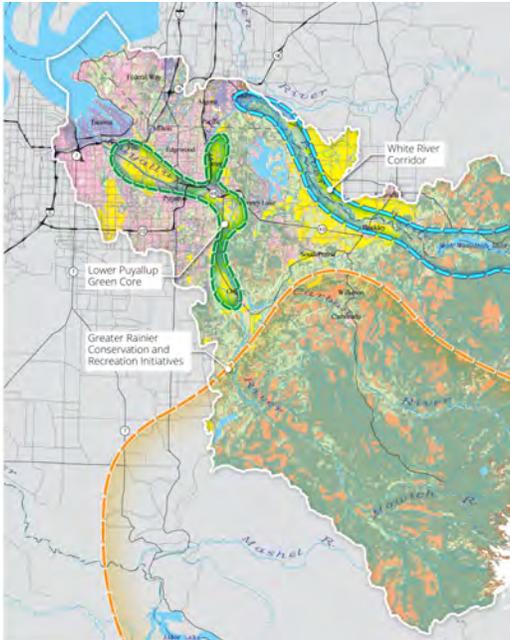
To support the recommended strategies and achieve the vision described in this report, the ROSS team utilized different approaches to develop watershed open space strategies (WOSSs) that could be used as models or tools for future efforts, as well as to provide relevant local planning studies to contribute to the overall ROSS sketch. These WOSSs, mentioned earlier in this document, are discussed in more detail in this chapter. Additionally, with ROSS partners Trust for Public Land (TPL) and Earth Economics two other support tools are being made available to the region: 1) a GIS-based Open Space Benefits Assessment Tool produced by TPL in a web-based platform to better inform policymakers of the benefits generated from open space and evaluate different land use scenarios; and 2) an open space services valuation methodology produced by Earth Economics to monetize services that open space provides and assist in incorporating the value of natural assets in traditional cost/benefit equations.

Watershed Open Space Strategies



▲ ROSS provided leadership for Watershed Open Space Strategies in three of the eight watersheds in the central Puget Sound region.

An appropriate scale to consider as a first step for regional open space planning, and ecological systems in particular is the watershed. Watershed boundaries do not follow political lines but align with hydrological boundaries, providing a more systematic and ecologically accurate way of identifying and managing natural landscapes and processes. Also, watershed planning in the central Puget Sound region already has a solid reputation for collaboration on issues for salmon conservation for more than 15 years. These efforts and plans can be built upon to encompass additional environmental and social goals and eventually scaled up for discussion at the regional level. Working with local governmental and advocacy groups, the ROSS team provided leadership for three Watershed Open Space Strategies (WOSSs), each in varying stages of preliminary planning. These were: the Puyallup-White, Green-Duwamish, and Snohomish watersheds. Initially, the ROSS intended to complete eight WOSSs, one for each of the region's watersheds, and then scale these up to create one regional, prioritized plan. Due to timing and funding limitations, the ROSS team was unable to complete all eight, but valuable lessons were acquired through these three planning efforts, the results of which were used to develop the initial ROSS Sketch illustrated in Chapter 4.



Geographically linked strategies with the Puyallup-White WOSS.

Each WOSS took a slightly different approach, all three aimed to identify targeted strategies, projects, and actions to capture local priorities and to better inform development of the overarching ROSS. Prioritized projects were those that would require outside assistance and collaboration; contribute most to the development and function of the inter-watershed, regional open space system; and provide maximum open space values. While each of the three watershed studies employed different processes that reflected their unique needs and capabilities, all three engaged local advisors and advocates in the analysis and planning process through a series of interactive meetings and workshops.

The lessons learned from these three initial planning efforts demonstrate the unique approaches watershed open space planning can take to address local interests. They can also be used as models for development of watershed open space strategies in the remaining five watersheds for stakeholders to develop their own strategies. Each is discussed in more detail below.

Puyallup-White WOSS

Completed in July of 2014, the Puyallup-White WOSS was the first watershed planning study conducted by the ROSS team. The goal of the effort was to identify opportunities for enhancing stewardship and access to public lands, as well as identifying priority areas for securing conservation and recreational lands. The WOSS presented four linked-action topics identified by the ROSS team, which together comprise the key issues for the Puyallup-White watershed. The topics included (1) the health of aquatic systems, (2) biodiversity, (3) availability and access to healthy, active lifestyles for individuals and communities, and (4) viability of resource lands.

Through careful examination of opportunities and issues in the watershed, and working with the “Communities of Interest” established through the Puyallup-White watershed initiative, the ROSS team identified three priority locations where challenges and associated opportunities overlapped geographically. These areas were named the *Green-Y*, located southeast of Tacoma; the *White River Corridor*, located around the White River; and the *Greater Rainier Conservation and Recreation Initiative* stretching from Mt. Rainier in the east, Highway 1 to the west, and nearly South Prairie to the north. It was concluded that focused actions within these areas could provide multiple open space services, and maximize conservation and stewardship resources for the benefit of the watershed and region on whole.



Source: King County
Map produced for the Regional Open Space System project,
University of Washington College of Built Environments Green
Future Lab, June 2015

Mapping of “Communities of Opportunity” in the lower Green-Duwamish watershed. Source: King County

Overall, the Puyallup-White WOSS Team and its Watershed Advisory Committee worked with established local communities of interest to identify regional trail gaps, threatened farmlands, areas of regular flooding, open space deserts near urban populations, and unprotected areas of highest ecological integrity. The Green-Y priority area was selected to capture multiple benefits of farmland preservation, trail connections, floodplain expansion, and open space provision for underserved communities. Preservation of the White River Corridor was identified to focus on riparian enhancement, and the “Greater Rainier Coalition” was selected to promote conservation and expand recreation-related economic activities in the communities surrounding Mount Rainier. (See Appendix X for more details about this WOSS.)

Green-Duwamish WOSS

For the highly populous Green-Duwamish Watershed, the ROSS team employed an intensive expert-engagement process of interviews, focus groups, and open houses in a Listening Phase to compile a thorough baseline of existing conditions, initiatives, and plans. The project’s Watershed Advisory Group identified priority foci for the watershed strategy, including social equity, a comprehensive approach to connected open space, and integration of stormwater planning.

As part of the Listening Phase, the team conducted focus groups, interviews, open houses, and an online survey. The primary goals of these activities were to collect insights from those who knew the Green-Duwamish Watershed, gather contextual information and data regarding the watershed, and identify potential actions to enhance its air, land, and water resources. From this initial work, it was determined that there were 90 plans and programs that involved the watershed, 45 of which required more exclusive review. There were also 74 consolidated ideas that came out of the Listening Phase, 39 of which were identified as the key concepts to focus on within the next phases of the WOSS work.

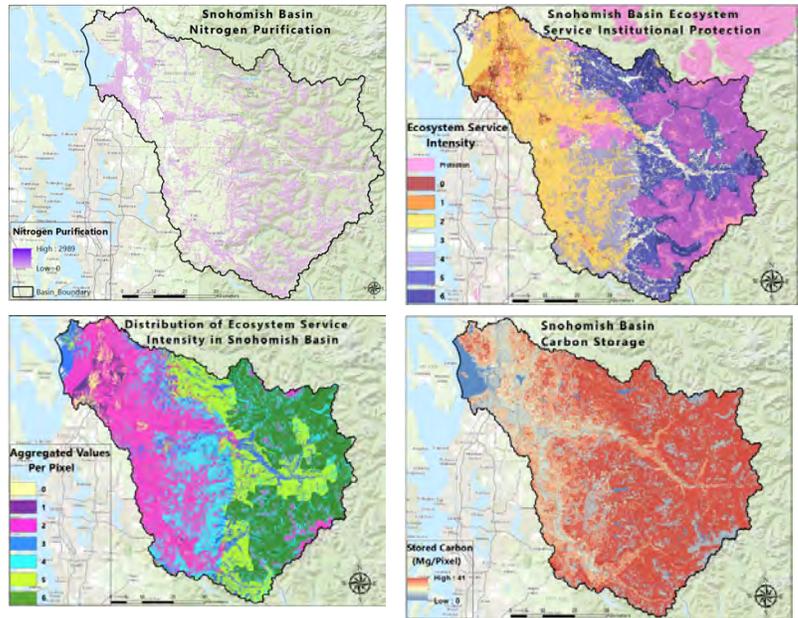
These key findings generally included:

- Existing plans, programs, and initiatives would benefit from enhanced coordination.
- There are gaps within planning and programming for human and ecosystem health.
- There are opportunities to better engage a broader public.
- While there are an abundance of studies, there were few conclusive analyses documenting problem and opportunity areas within the watershed.

Snohomish WOSS

At roughly 1,856 square miles, the Snohomish watershed is the second largest watershed draining into the Puget Sound. And as one of the fastest growing areas in the region, with considerable open space, farm and forest lands yet remaining, there is benefit to supporting efforts to better harness existing open space assets for social, cultural, environmental as well as economic benefits to the region.

Snohomish Basin
Ecosystem Services Analysis



The robustness of the existing open space system in the Snohomish watershed was examined by mapping extensive GIS data to identify the system's ability to provide economic, social, and environmental benefits. The ROSS team also identified ecosystem service "hot spots," or intense areas of ecological diversity at risk of being harmed, to inform subsequent planning. The team then worked with county, state, municipal, and non-profit organizations in a charrette setting to identify opportunities and challenges.

The results of the workshops and interviews are summarized into two sets of proposed actions, and not surprisingly are focused along the river corridors. One set of actions includes specific physical efforts organized by open space system component, such as pursuing biodiversity efforts in the Cascade Valley Heritage Corridor; while the other focuses on organizational proposals for the watershed, such as increasing coordination with US Forest Service in local planning efforts. With the limitations of this phase of work, the actions are not refined. The next step in the process should be to re-examine

the actions with appropriate parties within the watershed to refine them into working proposals in sufficient detail to apply for funding and support.

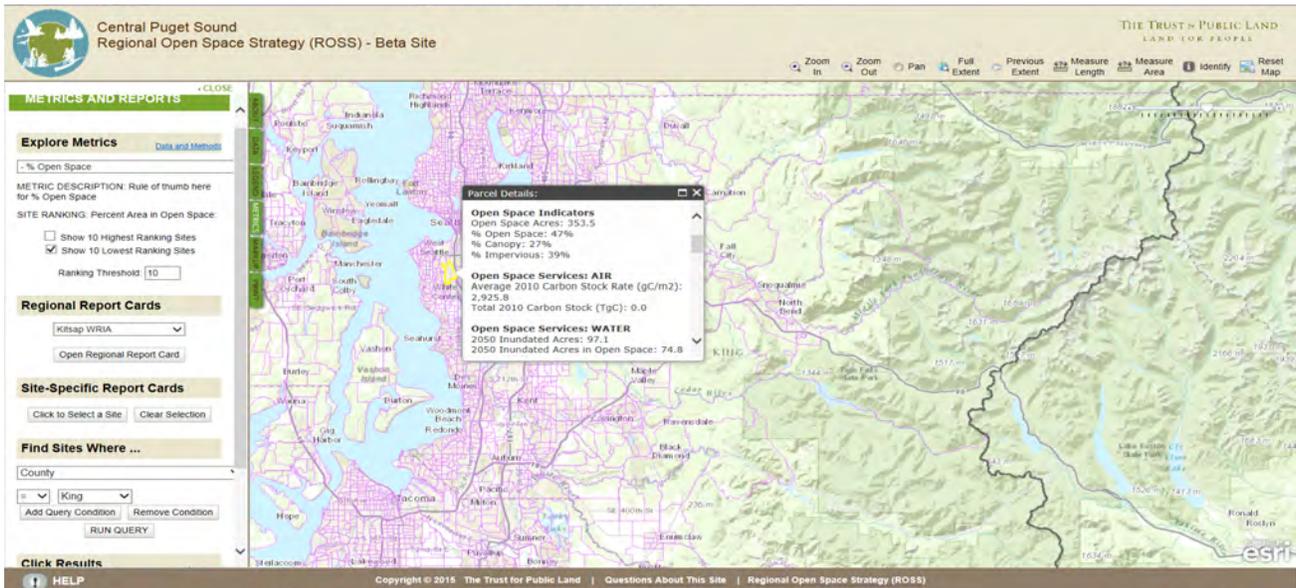
The ROSS team also evaluated and created spatial scenarios in order to understand the multiple benefits of potential collaborative actions and proposals in the watershed. Since economic development was a prevalent theme, possible future scenarios differentiated by economic development approaches were developed to determine what actions could be taken today to improve the open space system of tomorrow.

Analysis was conducted using InVest¹ modeling on three future scenarios. The goal of analyzing these scenarios was to recommend the economic strategies that could be implemented to bring about the greatest benefits. Due to the similarities in possible scenario outputs, specific recommendations were not possible based solely on scenario analysis. However the results indicated that the scenarios focused on agritourism or recreation would yield more substantial economic and ecosystem benefits than the business-as-usual, status quo scenario. (See Appendix X for more information.)

Open Space Benefits Assessment Tool

The Open Space Benefits Assessment Tool is being developed as a decision support tool to augment implementation of watershed strategies. In addition, it is designed to help regional policymakers better understand and visualize, at different scales, the multiple environmental, social, and economic benefits that open space provides. When fully developed, it will facilitate more informed prioritization of the protection and enhancement of open spaces in order to optimize these benefits. As such, the tool lays the foundation for a new regional data-driven approach to facilitating cross-jurisdictional, cross-organizational, and cross-departmental collaboration in the Puget Sound region and beyond.

¹ InVest is a suite of open-source software models used to map and value the goods and services from natural capital. (See <http://www.naturalcapitalproject.org/invest/>.)



Online OpenSpace Benefits Tool window.

As mentioned in Chapter 3, the ROSS team is working closely with TPL's GIS team to establish the basic architecture, functionality, and accessibility of the tool to include:

- An open space services baseline based on the best available scientific data;
- An overlay of the five regional challenges;
- Open space services conditions + demographic data;
- A query and report card function;
- A zooming function to capture multiple geographic scales.

As of this report's writing, the TPL GIS team, in collaboration with ROSS Staff and a team of regional experts, is in the process of identifying and collecting appropriate regional data to build this model into an interactive platform. When the work is complete and the tool is launched, currently expected in Fall 2016, the functionality will enable users to answer such queries as:

- What and where are the highest priority landscapes to protect in order to best mitigate against the effects of climate change (both rural and urban)?
- Where is open space, such as productive agricultural land, at increased risk of flooding due to higher annual precipitation totals and how can open space help mitigate some of that risk?
- Under a climate change scenario, where can open space be created in areas to help mitigate against urban heat island impacts on sensitive populations?

The ROSS team is working with TPL and the Puget Sound Regional Council (PSRC) staff to help market and demonstrate the tool’s capabilities within the network of policymakers across the region. The aim of this outreach is to best position the tool to work in conjunction with existing planning processes and landscape modeling tools to better incorporate open space into all aspects of regional growth management planning.

Ecosystem Service Valuation

Open Space Services

While researchers continue to document why open spaces must be conserved for human and ecological health we now have a better understanding of the significant ecosystem services and co-benefits provided by open space.

The Millennium Ecosystem Assessment (MEA) report breaks down these ecosystem services into four general types: supporting, regulating, cultural, and provisioning services (MEA 2005). The ROSS team adapted these MEA types and the individual services to create 16 overarching service categories that are provided by open spaces.

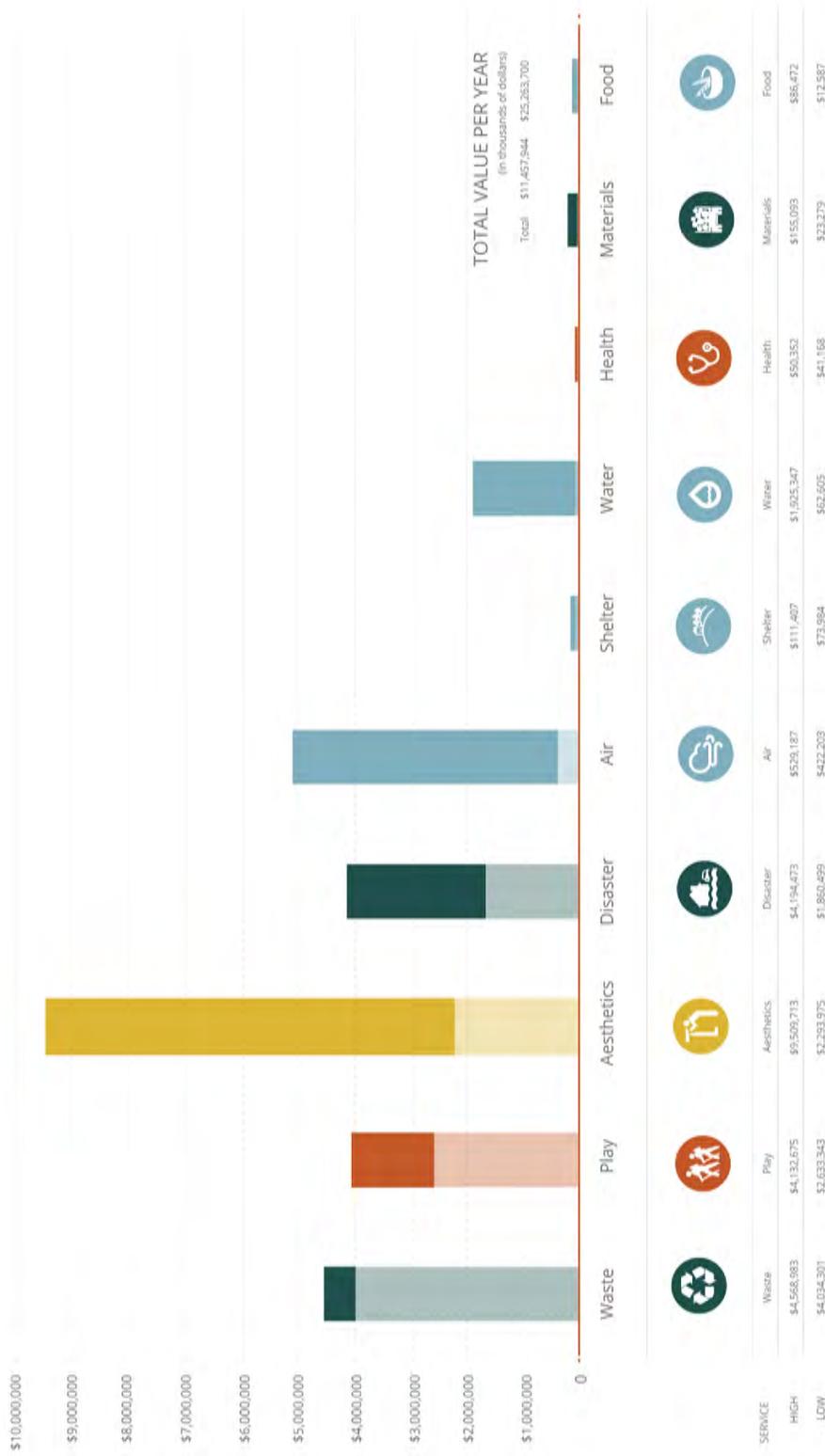
Each category describes a diversity of individual services. For instance, one open space service category is “air” which represents several individual services such as oxygen creation, carbon sequestration, and air purification. Other services within the air category include temperature moderation, noise reduction, and ultraviolet radiation reduction.

Another tool that can be combined with watershed planning and help policymakers think regionally is ecosystem service valuations. Such tools are becoming more widely available. Ecosystem valuation is also becoming more commonly incorporated into project evaluations by federal agencies such as FEMA and HUD. By utilizing ecosystem services valuation analysis for regional green infrastructure planning, policymakers will have an opportunity to better compare the costs and benefits associated with proposed land management practices and conservation efforts on a regional scale.

Using the ROSS Open Space Services Framework, Earth Economics evaluated the value of the benefits provided by the four counties’ open spaces, which contribute at least between \$11 and \$25 billion to the region’s economy annually. This study is available in the report *Open Space Valuation for Central Puget Sound* (Earth Economics 2015, Appendix X).

The ROSS Open Space Services Framework is shown here. 





▲ Graph above is showing estimated ranges of annual values created by priority open space services, also showing financial implications for the regional economy.



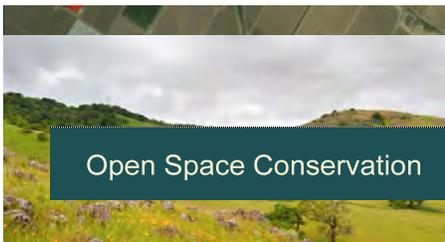
Riparian Restoration

Total Project Cost	Calculated Benefits	Return on Investment
\$4.6M	\$5.3M	1.16x



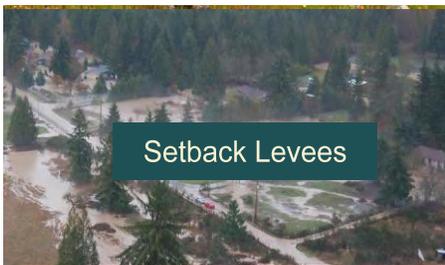
Aquifer Recharge

Total Project Cost	Calculated Benefits	Return on Investment
\$575,600	\$3.3M	4.67x



Open Space Conservation

Total Project Cost	Calculated Benefits	Return on Investment
\$8.1M	\$165M	20.4x



Setback Levees

Total Project Cost	Calculated Benefits	Return on Investment
\$4.1M	\$165M	20.4x

Several “return on investment” (ROI) studies have also been conducted by Earth Economics. Their examples range from a return of more than one dollar for every one dollar invested in a natural solution like riparian restoration, to a return of \$20 dollars for each dollar invested in open space conservation (Earth Economics, 2016, Appendix F). Open space service values for the ROSS study area documented in the *Open Space Valuation for Central Puget Sound* report can be used to calculate ROI for a wide variety of projects around Puget Sound, as can be seen in a follow up case study on conversion of agricultural and forest lands in the Green-Y study area of the Puyallup-White watershed (Appendix H + see box).

Other studies on ecosystem, or open space, service values are represented in the following reports and factsheets.

- Pierce County’s Green Y (Appendix X)
- Ecosystem Service Values Lost from Land Conversion in the Central Puget Sound Region (Appendix X)
- Bicycle and Pedestrian Trails Build Resilience and Offer Broad Benefits (Appendix X)

◀ These illustrations of Return on Investment were presented to the ROSS Executive Committee by Earth Economics on February 17, 2016.

A CASE STUDY:

Application of Open Space Valuation in the Green-Y

The Puyallup-White WOSS presented three linked action topics one of which – viability of resource lands in a semi-urban area – became the focus for a separate in-depth analysis. The Green-Y study area is approximately 152,448 acres, and located southeast of the Tacoma. The Green-Y report (Appendix G) discussed the existing agricultural and working forest resource lands in the study area and calculated their economic value to the region, to support their protection.

Between 1992 and 2011, 1,942 agricultural land cover acres and 8,089 forest land cover acres were lost to urban use within the Green-Y study area alone. If the study area is developed to the maximum allowed under comprehensive plan and zoning designations, the area would lose an additional 6,505 acres of agricultural land cover and 31,965 acres of forest land cover. This equates to approximately 43 percent and 100 percent of the existing resource acres in the study area, respectively. Land conversion, the process of transforming land from one use type or land cover to another, is a primary threat to keeping natural infrastructure intact. This is true historically and currently, as the prevailing trends of conversion are to clear and grade vegetated land cover, and replace vegetation with residential and urbanized development and its attendant impervious land cover.

Using the methodology developed by Earth Economics, the true cost of this expected resource land loss is conservatively between \$82 and \$188 million annually based on open space service values. This would represent a significant, negative economic impact to the region in two respects. The first is that the total economic productivity of resource lands would be significantly reduced. The second is that if the region is to enjoy the same level of service that is currently provided by these open spaces, in the form of carbon sequestration, maintenance of water and air quality, food production, and many others, the costs for engineered substitutes would be substantial. Without conservation and potential regulatory changes, the area would experience diminished access to food, jobs, health, recreation and diversity in a way of life.



▲ Above: Land cover of the Green

	Low	High
Current Valuation	\$83,664,517	\$200,319,036
Future Valuation	\$1,102,252	\$12,112,896
Difference	(\$82,562,265)	(\$188,206,141)



Total existing and predicted economic value of open space services attributed to resource lands in the Green-Y study area, illustrating potential value loss without protection.

While the final chapters of the Green-Y report focus on the regulatory framework that allows this conversion to occur, and how it could be altered to better protect resource lands, the rationale for the discussion is the stunning economic loss that conversion to more urban development would bring. By presenting the economic impact in dollars, the report provides a major change in the cost/benefit equation. The work of Earth Economics and the ROSS team provides a different perspective on the benefits of protecting open spaces. (The full report can be found in Appendix F.)

A brochure suggesting regulatory tools to conserve resource lands in urbanizing areas can be found in Appendix G.





Chapter 6

Actions

CHAPTER 6: ACTIONS



To achieve the original goals of the ROSS, the strategy recommends five main actions. Together, these actions constitute a general strategy to protect and enhance the open spaces system throughout the Puget Sound. The five actions include:

1. Create a dynamic regional vision;
2. Establish an integrating planning structure;;
3. Expand and streamline funding;
4. Advance supportive tools; and
5. Convene a collaborative forum.

Each of these five recommended actions were discussed within Chapter 3 as components of the overall ROSS strategy. While each of these recommendations could be advanced separately and would result in regional benefit on their own, the strategy will be most effective when enacted together. This chapter builds on the discussion in Chapter 3 with further suggestions that enumerate how each action could be initiated. These suggestions originated only with UW Green Futures Lab (GFL) staff to instigate further discussion and process and are not a reflection of the ROSS funders or members of the Executive Committee. Neither have these suggestions been vetted by the parties identified.



To prompt activity, specific “near-term” activities and those to be undertaken “over-time” are presented under each of the actions. In the table at the end of this chapter the activities are listed with target time frames and suggested leads to initiate the efforts.

Create a Dynamic Regional Vision

Near-Term Activities: To kick-start the conversation on a dynamic regional open space vision, the process of identifying a “wish list” will help to build the overarching idea of that vision. Geographically locating actions on a map will more vividly show the connections between the various planning efforts already underway and provide the foundation for development of policies and processes for that vision.

The initial ROSS Sketch could serve as the basis for discussion to develop this first graphic representation of a vision. It would be essential to convene a widely representative stakeholder advisory group to provide periodic feedback during the map’s development. A technical advisory group comprised of key

Environmental Stewardship Goals and Policies

From VISION 2040

Goal: The region will safeguard the natural environment by meeting the needs of the present without compromising the ability of future generations to meet their own needs (VISION 2040, 2008, 35).

MPP-En-1: Develop region wide environmental strategies, coordinating among local jurisdictions, salmon recovery planning forums,* and countywide planning groups

MPP-En-2: Use integrated and interdisciplinary approaches for environmental planning and assessment at regional, countywide and local levels.

*Example amendment

Source: VISION 2040, 2008



tribal and agency representatives would also be beneficial to prioritization of specific conservation projects and programs. Exercises such as these can lead to development of policies as well as to guide future processes. To maintain momentum, it would be important to conduct this exercise within a year's time. Development of this map could be viewed as an initial step, a prototype to be revisited in a more rigorous process, which will be formally outlined concurrently during this kickstart exercise and informed by it.

As the Puget Sound Regional Planning Council (PSRC) has a proven reputation for planning at the regional scale, the ROSS suggests that PSRC be the "trailblazer" or catalyst in this initial effort. This work is especially timely as PSRC is embarking on its Regional Centers Framework Update Project. Regional Centers and open space need to be planned for jointly consistent with the environmental framework established in VISION 2040. Lessons learned can then be incorporated into the development of Multicounty Planning Policies (MPPs) during the update of VISION 2040. MPPs can more formally direct development of Countywide Planning Policies (CPPs), and subsequent local government comprehensive plans. (See additional discussion under Establishing an Integrating Planning Structure, below.)

Over-Time Activities: As part of the update of VISION 2040 (scheduled for update in spring 2018), PSRC could incorporate changes to the MPPs that more strongly focus land use coordination with salmon recovery and environmental planning through changes in the CPPs. The counties together with their cities could then develop CPPs that guide local governments to integrate with salmon recovery planning efforts to ensure land use and environmental issues are addressed in spatializing watershed open space plans as part of their comprehensive planning processes. The local government plans can then be the first step toward revising the initial regional open space vision and priorities.

Establish an Integrating Planning Structure

Our findings demonstrate that there is no clear requirement for those engaged in land use and resource/environmental planning to coordinate efforts, integrate results, or find multiple benefits from single actions. (The disconnect between land use planning and environmental planning is explained in Chapter 2.) While some collaborate voluntarily, the instance where collaboration between land use and environmental disciplines occurs is often by happenstance.

Policies for Open Space Preservation, Resource Protection, Critical Areas, Air, and Water Quality/Quantity (PPCAAW)

From Kitsap County
Countywide Planning Policies

1. Creating a regional network of open space:
 - a. The County and the Cities shall implement the Kitsap County Open Space Plan and the Kitsap County Consolidated Greenway Plan which identify a countywide green space strategy that incorporates planning efforts of the County, Cities, state agencies, non-profit interest groups and land trusts in the County.
 - b. The County and the Cities shall preserve and enhance, through inter-jurisdictional planning, *including with WRIA 15 and adjacent WRAs**, significant networks and linkages of open space, regional parks and public/ private recreation areas, wildlife habitats, critical areas and resource lands; historic and cultural landscapes; water bodies and trails

* Example amending text.

Source: Kitsap County CPPs, 2015

The actions under this ROSS recommendation center around formalizing collaboration between land use agencies and with environmental/resource agencies. This could most easily be accomplished through mutual agreement, rather than legislation. However, legislation would acknowledge and validate the power of these relationships.

Near-Term Activities: As administrators of large scale public policy programs, the Puget Sound Partnership and Puget Sound Regional Council could develop a memorandum of understanding (MOU) to align work programs toward shared goals. This relationship could be the launch of a prototype of how linkages between environment and land use could work to move policies to mutual benefit. The MOU could articulate goals of both entities; formalize agreement on objectives of both entities to advance those goals; address working relationship with Lead Integrating Organizations (LIOs), Lead Entities (LEs), and Water Resource Inventory Area (WRIA) forums; identify work products, processes, and schedules, in particular characterizing major criteria for regional priorities; and other items as appropriate. The MOU could stipulate agreement on review of the MOU at a specified future date.

Similarly PSRC could develop MOUs with its member governments to ensure that integration of land use and environment is occurring from the local government up to the regional level.

Leadership from the PSRC to integrate land use with environment is most likely the role of the Growth Management Policy Board, however the Executive Committee could decide to create separate Open Space Policy Council or other structure(s). These are organizational issues that will need to be resolved internally within PSRC should that organization move forward with open space strategy development.

Over-Time Activities: Assuming the initial efforts to informally link PSP goals with PSRC, efforts could be made to more formally establish these linkages, either through state legislation (such as strengthening GMA) or more specific Memoranda of Agreements.

Regardless of more formal processes at the state level, PSRC could take proactive actions to formalize linkages to open space conservation within the central Puget Sound region. This would start with strengthening the Multi-county Planning Policies with more explicit goals about open space conservation and performance standards for the region. It would also involve agreement on policies related to preparing open space plans, identification of priorities, and connecting

with salmon recovery planning efforts during comprehensive plan development.

The MPPs would translate open space conservation goals to the county level with countywide planning policies (CPPs). This would enable a closer connection to communities by allowing more individualization about priorities by county.

Expand and Streamline Funding

Based on our research and findings it is clear there is not adequate funding to address the needs for open space conservation and the limited funding that is available is not efficiently disbursed nor effectively programmed to the projects and activities that will result in the greatest environmental benefit. This will require large-scale change from all levels of government and philanthropic entities.

Near-Term Activities: To the extent possible, the following voluntary commitments by entities from all levels of government would greatly improve efficiency and effectiveness of dollars invested in conservation programs, projects and activities:

- Wherever possible consolidate government funding dollars into fewer agencies for the express purpose of funding regional priorities;
- Provide guidance to encourage priorities on acquisition, preservation and restoration; and
- Encourage private and non-governmental entities to do the same.

To the extent possible, funding agencies could voluntarily:

- Expedite funding processes, such as revising the request-for-proposal system. This could be done by developing a form for all entities to submit statements of qualifications, indicating areas of expertise and interest, geographies of interest, and staffing levels to better assist funders in matching projects with implementers;
- Develop processes for selecting appropriate grant recipients, synchronizing timing of release of funds, reducing time, resources, and competition to qualify to be a recipient; and
- Ensure monitoring and adaptive management of performance goals are conducted at all levels.

Over-Time Activities: All funding entities could work to formalize consolidation of funding to more closely mirror the

model exhibited in implementing transportation infrastructure planning and development. This would require encouraging the federal government to elevate policy goals and funding into fewer agencies and programs or devise more creative approaches to simplify requests for and distribution of funds. State government could assist this effort by funneling dollars into a common account or aligning themselves more closely to the model developed by the Recreation and Conservation Office in their distribution of Washington Wildlife and Recreation, Land and Water Conservation or Salmon Recovery funds which are criteria-based.

Additionally, for purposes of the Puget Sound region, the non-profit foundation authorized under PSP could be activated to receive large blocks of funds from this consolidated process. Articles of incorporation were filed with the Secretary of State in 2008, but the foundation has been dormant since that time. If this specific non-profit is not satisfactory for the purposes of consolidating disbursement of funds, then steps would need to be taken to authorize a new or existing entity for this purpose. In comparison to a governmental agency, a non-profit entity may provide the flexibility and responsiveness necessary to respond to emerging opportunities, especially related to land ownership transfers, and to solicit philanthropic contributions.

Advance Supportive Tools

The region is fortunate to already have a wealth of data and tools available. However, it lacks a uniformly consistent data base for existing environmental and land use information across all jurisdictions. While those jurisdictions with resources may have robust systems for analyzing and evaluating alternatives and decisions, other jurisdictions (the majority of them) work with insufficient information. The region needs to centralize the land use and natural resource database, and complete data gaps for regional decision-making. Funding to increase new data and research, and develop new analysis tools to assist decision-makers needs regional backing.

Near-Term Activities: PSRC could gather land use, resource and environmental GIS data from its member jurisdictions, including information developed through salmon recovery processes, to begin consolidating that data into its regional database. It could identify data gaps and work with members on steps to complete the system at a scale that is consistent

with overall regional decision-making.

The PSRC could also assist its members to take advantage of the Open Space Benefits Assessment Tool being developed by TPL by promoting its availability and training provided by TPL. The tool and its data base could also augment PSRC’s data library as it prepares for the VISION 2040 update.

Over-Time Activities: To ensure information is kept up to date, PSRC and its partners could develop protocols to facilitate information exchange.

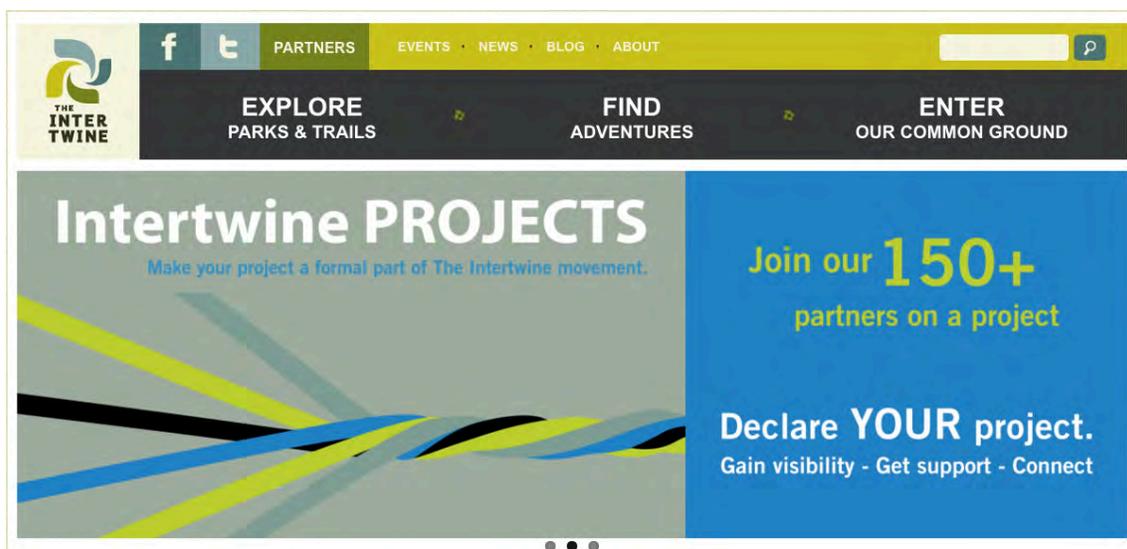
To further assist the region, PSRC could evaluate the utility of the Open Space Services Benefits Assessment Tool and assist the region with its update, replacement, or exploration of other analytical tools. The region needs to support PSRC with continued funding for these efforts.

Convene a Collaborative Alliance

Want to learn more?

The Intertwine website screenshot. Visit <http://theintertwine.org/> to learn more about this partnership of 150+ public, private, and non-profit organizations integrating open space throughout the Portland-Vancouver metropolitan region.

The Pacific Northwest is home to an extensive assemblage of Tribal nations, non-profit organizations, governments, experts, business leaders, advocates, and other stakeholders with a vested interest in open space conservation. Yet the region lacks a central forum where organizations can share their intentions and accomplishments, support each other, and forge partnerships for collaboration. In the face of responding to major efforts, there is often a call to bring together some of these organizations, for example, to support a trail expansion, save a major forested parcel from conversion to subdivision, or advocate for public funding for conservation or operation and maintenance of open space assets. These efforts often require setting up a coalition of like-minded groups and individuals. Having an organizational structure at-the-ready would save time



and resources in the future, as new needs arise. And bringing together public, private and nonprofit organizations dedicated to the broad range of open space conservation would present a powerful influence on regional attitudes.

The ROSS recommendation to create a new umbrella coordinating alliance to enhance collaboration is not a unique idea. There are several examples of successful collaborative efforts on open space issues that the central Puget Sound region could emulate. The Intertwine Alliance in the metropolitan Portland-Vancouver area is a successful Northwest example. The alliance resulted from a similar need for increased collaboration. They have recently compiled lessons-learned from their evolution and are developing a model that can be adapted to other locations so that others can share in similar successes.

Near-Term Activities: One of the non-profit entities such as the Washington Association of Land Trusts, the Washington Wildlife and Recreation Coalition, or other entity interested in enhancing collaboration could coordinate a gathering of regional stakeholders featuring a representative of the Intertwine Alliance or engage a representative as a consultant. The specific purpose of the event would be to learn about the successes of the Intertwine and discuss the appropriateness of a similar alliance for the central Puget Sound region.

Over-Time Activities: Build momentum for a central Puget Sound regional alliance that meets regularly to celebrate and advance the efforts of its members, share methods and tools, and unite to address regional challenges through open space conservation and enhancement. The alliance would need to establish and find funding to support the administrative functions and coordinate with the development of the ROSS vision to advocate for healthy people, places and economy.



Suggested Activities to Implement Actions			
Activity		Suggested Lead ¹	Target
1	Create a Dynamic Regional Vision		
	Near Term		
1a	Use initial ROSS Sketch Vision as basis for discussion for first spatialized vision	PSRC or other Regional Planning Trailblazer	2017
1b	Collate existing local priorities from salmon recovery plans & local comprehensive plans	PSRC or other Regional Planning Trailblazer/with help from state & local governments	2017
1c	Convene stakeholders and technical advisory groups to advise on open space vision and subsequent process	PSRC or other Regional Planning Trailblazer	2016-2017
1d	Develop prioritized spatialized regional open space plan	PSRC or other Regional Planning Trailblazer	2017
	Over Time		
1e	Develop process for future refinements and updates of initial open space plan in concert with growth strategies (land use/transportation)	PSRC	2016-2018
1f	Refine initial open space plan as part of VISION 2040 update	PSRC	2018
2	Establish an Integrating Planning Structure		
	Near Term		
2a	Informally connect existing watershed and land use planning efforts	PSRC, PSP/LIO, counties & cities	2016
2b	Establish an Open Space Policy Council to advise the GMPB on policy and implementation in advance of VISION 2040 update	PSRC	2017
	Over Time		
2c	Develop multicounty planning policies to encourage watershed open space strategies	PSRC	2018
2d	Integrate comprehensive land use planning with salmon recovery planning	Local governments and WRIAs	2018+

¹ In the absence of any committed entity to assume a lead role, we have suggested “Trailblazers” to invite entities to assume a lead role, understanding that all activities will need the active participation of federal, state, regional and local governments as well as tribal nations, NGOs, and private interests.

Suggested Activities to Implement Actions			
Activity		Suggested Lead ¹	Target
3	Expand & Streamline Funding		
	Near Term		
3a	Federal, State, and local agencies start to consolidate large blocks of funds into limited categories, e.g., FHWA & FTA model for WSDOT	Fed, State, and local agencies	2017
3b	Centralize an organization to receive and distribute funds	PSP Foundation or other state or NGO trailblazer	2016/2017
	Over Time		
3c	Develop criteria and process for distribution of funds based on prioritization and equity	Funding Trailblazer	2017
4	Advance Supportive Tools		
	Near Term		
4a	Expand regional database to include environmental and natural resource data sets	Data Trailblazer	2017
4b	Identify regional data gaps and start to fill them in	Data Trailblazer	2017
	Over Time		
4c	Identify regional additional tools for adaptive management	Data Trailblazer	2018
4d	Update web-based open space assessment tool or solicit for new tool	Data Trailblazer	2019
4e	Expand assessment tool to add monetization or create new model	Data Trailblazer	2020
5	Convene a Collaborative Forum		
	Near Term		
5a	Initiate discussion about an alliance by inviting representative from Intertwine Alliance or engaging representative as a consultant	NGO Trailblazer	2016
5b	Confirm interest among potential partners	NGO Trailblazer	2016
5c	Seek funding for initial administrative activity	NGO Trailblazer	2017
5c	Formalize coordination of NGOs, business, & other stakeholders by creating an Intertwine-like alliance	NGO Trailblazer	2017
	Over Time		
5d	Advocate for open space inside and outside of urban areas	New Alliance	2018 +



REFERENCES

- Access Washington. "Washington's GIS Open Data Site." Accessed September 1, 2015.
<http://washingtonopendata.wa-geoservices.opendata.arcgis.com/>.
- Active Living Research. 2011. *Research Synthesis: Do All Children Have Places to Be Active? Disparities in Access to Physical Activity Environments in Racial and Ethnic Minority and Lower-Income Communities*
- American Physical Society (APS). "Direct Air Capture of CO2 with Chemicals: A Technology Assessment for the APS Panel on Public Affairs." Last updated June 1, 2011.
<http://www.aps.org/policy/reports/assessments/upload/dac2011.pdf>.
- Andrews, Leann and Kathleen Wolfe, for the Regional Open Space Strategy (ROSS). "Open Space and Human Health in the Central Puget Sound Region." 2015. Access at:
http://openspacepugetsound.org/sites/default/files/160309_HumanHealth.pdf. Last accessed: October 4, 2016.
- Beatley, Timothy, "Biohabitats, Leaf Litter – Thoughts on Reintegrating Urban Ecology." Accessed May 2016. 5/2016. <http://www.biohabitats.com/newsletters/reintegrating-urban-ecology/>
- Beatley, Timothy. "Biophilic Cities: Integrating Nature into Urban Design and Planning." Island Press. 2011.
- Carrara, Francesco, Andrea Rinaldo, Andrea Giometto, and Florian Altermatt. "Complex Interaction of Dendritic Connectivity and Hierarchical Patch Size on Biodiversity in River-Like Landscapes." *The American Naturalist* 183, no. 1 (2014): 13-25.
- Canty, Dennis, Alex Martinsons, and Anshika Kumar. "Losing Ground: Farmland Protection in the Puget Sound Region." *American Farmland Trust*. Last updated January 2012.
http://www.farmlandinfo.org/sites/default/files/AFTLosingGroundReportWeb-1_1.pdf.
- Cascade Land Conservancy. "A Resource Guide to Designing Transfer of Development Rights Programs in Washington State." Last updated June 2009. <http://mrsc.org/getmedia/CFED8D6D-6F3E-4224-A6B6-5871732C04AE/W3-TDR.aspx>.
- Chadsey, Matt, Zac Christin, and Angela Fletcher. *Central Puget Sound Open Space Valuation*. Tacoma, WA: Earth Economics (2015).
- Chauhan, Ashok K. and Ajit Varma (Eds.). *Microbiology Series: Microbes: Health and Environment*. I.K. International Publishing House Pvt. Ltd.: New Delhi, 2006.
- Childers, Jonathan and Richard Gelb, for the Regional Open Space Strategy (ROSS). "Open Space and Social Equity in the Central Puget Sound Region." 2015. Access at:
http://openspacepugetsound.org/sites/default/files/SocialEquity_section1.pdf. Last accessed: October 4, 2016.
- Corbett, M.R. (Ed.). *Greenline Parks: Land Conservation Trends for the Eighties and Beyond*. National Parks and Conservation Association; Washington, DC, 1983.
- Dreistadt Steve H., Donald L. Dahlsten and Gordon W. Frankie. "Urban Forests and Insect Ecology." *BioScience* 40, no. 3 (1990): 192-198.

- Earth Economics. *Agricultural Shift in Puyallup's Green Heart (title not final)*. 2015 (in press).
- Earth Economics. *Return on Natural Capital Investments (briefing paper)*. February 3, 2016.
- Encyclopaedia Britannica. "Penicillium Fungus." Accessed June 30, 2016.
<https://www.britannica.com/science/Penicillium>.
- Evans, Erv. "Tree Facts." *North Carolina State University*. Accessed April 12, 2015.
<http://www.ncsu.edu/project/treesofstrength/treefact.htm>.
- Floodplains by Design. "Innovation Through Collaboration." Accessed March 21, 2016.
<http://www.floodplainsbydesign.org/>.
- Forterra. "The Cascade Agenda: A 100 Year Vision for Pierce, King, Kittitas, and Snohomish Counties." Accessed March 21, 2016. <https://forterra.org/wp-content/uploads/2015/05/Cascade-Agenda-Full-Report-Forterra.pdf>.
- Frey, Sarah J. K., Adam S. Hadley, Sherri L. Johnson, Mark Schulze, Julia A. Jones, and Matthew G. Betts. "Spatial models reveal the microclimatic buffering capacity of old-growth forests." *Science Advances* 2, no. 4 (22 April 2016). Accessible from: <http://advances.sciencemag.org/content/2/4/e1501392>.
- Floberg, J.M., et.al., "Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, Volume One: Report." Prepared by The Nature Conservancy with support from the Nature Conservancy of Canada, Washington Department of Fish and Wildlife, Washington Department of Natural Resources (Natural Heritage and Nearshore Habitat programs), Oregon State Natural Heritage Information Center and the British Columbia Conservation Data Centre. March 2004.
- Gregg, Rachel et al. "Open Space and Climate Change in the Central Puget Sound Region." 2014. Access at: http://openspacepugetsound.org/sites/default/files/151026_ClimateChange.pdf. Last accessed: October 4, 2016.
- Hamel, N., et.al., *2015 State of the Sound: Report on the Puget Sound Vital Signs*. November 2015. 86pp.www.psp.wa.gov/sos.
- Hyde, P. (2011). American Public Health Association Meeting. Washington, DC. Retrieved from <http://www.youtube.com/playlist?list=PL9C08AF379312AD16&feature=plcp>
- Inghram, Paul. "Growth in the Puget Sound Region." *Presentation given to the ROSS Executive Committee* on February 17, 2016. Accessible from:
<http://openspacepugetsound.org/sites/default/files/Growth%20presentation%20ROSS%202-17-2016.pdf>.
- Jahnke, Art. "Who Picks Up the Tab for Science?", Part 1 of a 4 Part Series. *Boston University Today Special Report*, April 6, 2015. Accessible at: <http://www.bu.edu/today/2015/funding-for-scientific-research/>
- Kollin, Cheryl and James Schwab, AICP. "Chapter 1: Bringing Nature into the City." In *Planning for the Urban Forest*, edited by James Schwab, 1- 24. In *American Planning Association, Report Number 555*, 2009.

- Koontz, Fred and Abby Hook. 2014. "Open Space and Biodiversity in the Central Puget Sound Region." 2014. Access at: http://openspacepugetsound.org/sites/default/files/151028_Biodiversity.pdf. Last accessed: October 4, 2016.
- Lant, Christopher L., J. B. Ruhl, and Steven E. Kraft. "The Tragedy of Ecosystem Services." *BioScience* 58, no. 10 (2008): 969-974.
- Little, C.E., 1990. *Greenways for America*. The Johns Hopkins University Press, Baltimore
- Lombard, John H. *Saving Puget Sound: A Conservation Strategy for the 21st Century*. Seattle, UW Press. 2006.
- Metropolitan Greenspace Alliance (MGA). "Mission." Accessed April 5, 2016. <http://metrogreenspace.org/mission.html>.
- Millenium Ecosystem Assessment. *Ecosystems and Human Well-being: Synthesis*. Washington, D.C.; Island Press (2005). Available from www.milleniumpassessment.org.
- Millennium Ecosystem Assessment Board. "Statement of the MA Board: Living Beyond Our Means: Natural Assets and Human Well-being." Accessed 2015. Available from: <http://www.millenniumpassessment.org/en/BoardStatement.html>.
- National Center for Charitable Statistics (NCCS). "Summary Views." Accessed July 28, 2015. <http://nccsweb.urban.org/PubApps/geoShowVals.php?id=305915&code=53033&ntee1=CD>.
- National Park Service (NPS). "Pink Meadowsweet." Accessed June 30, 2016. <https://www.nps.gov/miss/learn/nature/prairestpinkl.htm>.
- National Priorities Project. "Federal Spending: Where Does the Money Go: Federal Budget 101." Accessed July 31, 2015. <https://www.nationalpriorities.org/budget-basics/federal-budget-101/spending/>.
- NatureServe. 2006. <http://www.natureserve.org/consIssues/tenReasons.jsp>
- Nowak, David J., Susan M. Stein, Paula B. Randler, Eric J. Greenfield, Sara J. Comas, Mary A. Carr, and Ralph J. Alig. "Sustaining America's Urban Trees and Forests." In *United States Department of Agriculture Forest Service General Technical Report NRS-62*, June 2010. http://www.fs.fed.us/openspace/fote/reports/nrs-62_sustaining_americas_urban.pdf.
- NOAA Fisheries. 2007. "Puget Sound Salmon Recovery Plan, Vol 1." As adopted by the *National Marine Fisheries Service (NMFS)*. January 19, 2007.
- Phillips, Don. "Assessment of Ecosystem Services Provided by Urban Trees: Public Lands Within the Urban Growth Boundary of Corvallis, Oregon: Technical Report." Accessed October 1, 2014. http://www.itreetools.org/resources/reports/Corvallis_Urban_Tree_Assessment_Tech_Report.pdf.
- Prosperity Partnership, "Regional Economic Strategy for the Central Puget Sound Region: Strategy," Puget Sound Regional Council, July 2012. <http://www.psrc.org/assets/8558/RegionalEconomicStrategy.pdf?processed=true>.

- Puget Sound Governmental Conference and Puget Sound Regional Planning Council. "Project Open Space: Summary Report." Last updated in 1966.
<http://www.psrc.org/assets/3396/OSFinalCopy.pdf?processed=true>.
- Puget Sound Partnership (PSP). "Puget Sound Vital Signs: Land Development and Cover." Accessed August 26, 2015. http://www.psp.wa.gov/vitalsigns/land_cover_and_development.php.
- Puget Sound Regional Council (PSRC). "Vision 2040." Last updated December 2009.
<http://www.psrc.org/assets/366/7293-V2040.pdf?processed=true>.
- Puget Sound Regional Council (PSRC). "Puget Sound Trends: Population of Cities and Towns." Last updated January 2015. <http://www.psrc.org/assets/2782/trend-d3.pdf?processed=true>.
- Puget Sound Regional Council (PSRC(a)). "About PSRC." Accessed June 28, 2016.
<http://www.psrc.org/about/>
- Puget Sound Regional Council (PSRC(b)). "VISION 2040." Accessed June 28, 2016.
<http://www.psrc.org/growth/vision2040>
- Raker, Jeffrey and Ikuno Masterson. "Open Space and Economic Development in the Central Puget Sound Region." 2015. Access at:
http://openspacepugetsound.org/sites/default/files/EconomicDev_Sec1.pdf. Last accessed: October 4, 2016.
- Rottle, Nancy D. "Factors in the landscape-based greenway: a Mountains to Sound case study." *Landscape and Urban Planning*, vol. 76, pp. 134-171. April 2—6.
- Shadid, Sarah, Andrew Martin, and Christopher Clark. *Implementation of the Regional Open Space Strategy for the Central Puget Sound*. Seattle, WA: University of Washington (2015).
- Tacoma-Pierce County Health Department (TPCHD). "Pierce County Environmental Health 2014: Land and Food." Accessed September 4, 2015. <http://www.tpchd.org/files/library/a55f0f3dbb46fb7e.pdf>.
- The Intertwine. "The Intertwine Alliance." Accessed April 5, 2016. <http://theintertwine.org/about>.
- The Seattle Times, Environment/Opinion, Norm Dicks and Dan Evans "Little-known Land and Water Conservation Fund vital to outdoor legacy", November 9, 2013.
- The Trust for Public Lands, "The Economic Benefits of the Washington Wildlife & Recreation Program", December, 2010.
- Titcomb, Sarah. "Urban Forestry in a Time of Climate Change." Last updated 2015.
<https://digital.lib.washington.edu/researchworks/handle/1773/34197>.
- Washington Biodiversity Council, Washington's Biodiversity Status and Threats. Washington State Department of Printing. January 2007.
- Washington State Department of Ecology (Ecology). "Western Washington Land Cover Change." Last updated April 16, 2014.
<http://www.ecy.wa.gov/services/gis/data/imageryBaseMapsEarthCover/landcover/landcover.htm>

- Washington State Office of Financial Management (OFM), "Final 2007 GMA Population Projections (RCW 43.62.035): Section 5. Additional Information for Puget Sound Counties," Last updated November 2007, <http://www.ofm.wa.gov/pop/gma/pugetsound.pdf>.
- Whyte, William H. 1968. *The Last Landscape*. Garden City, NY: Doubleday.
- Wolf, Kathleen L., PhD, "Trees mean business," *invest from the ground up*, Last updated May 29, 2013. <http://investfromthegroundup.org/trees-mean-business/>.
- Wolf, K.L., Robbins, and A.S.T. (2015). "Metro Nature, Environmental Health, and Economic Value." *Environmental Health Perspectives* 123, 5: 390-98.
- United States Department of Agriculture (USDA). "2012 Census of Agriculture – County Data." *National Agricultural Statistics Service*. Last updated in 2012. http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Washington/st53_2_001_001.pdf.
- USA Spending.Gov. "Advanced Data Search." Accessed July 31, 2015. <https://www.usaspending.gov/Pages/AdvancedSearch.aspx?sub=y&ST=C,G,L,O&FY=2015&A=0&SS=USA&k=conservation>.
- Zube, E.H., 1995. Greenways and the US National Park System. *Landscape Urban Plann.* 33, 17–25.





APPENDICES

ROSS Reports, Studies and Tools

TABLE OF CONTENTS – APPENDICES

Appendix A: Scoping Report

Documenting the initial investigation into the need for a Regional Open Space Strategy, the report identifies an effective stakeholder engagement process, appropriate analytical methods, and required resources for the ROSS project. Key findings within the report include verification that a regional open space strategy is needed, and that the planning process must work regionally as well as on the watershed scale.

Appendix B: Technical Background Report

Compiles the work of the four Technical Advisory Committees (TACs) on ecosystems, rural and resource lands, recreation and trails, and urban and community development. The four TACs represent the four components of a robust open space network, and informed the Preliminary Comprehensive Strategy.

Appendix C: Preliminary Comprehensive Strategy

The ROSS Preliminary Strategy outlines the ROSS vision derived from extensive expert engagement, and lays out a work plan strategy, tools, and frameworks necessary to guide the development of seven Watershed Open Space Strategies (WOSSes) and a coalesced Regional Open Space Strategy.

Appendix D: Addressing Regional Challenges through Open Space

This section provides (D1) a summary of the work of the ROSS Ecosystem Services Committee, with an overview and synthesis of five white papers on how open space conservation and enhancement can significantly address five regional challenges: Climate Change; Biodiversity; Social Equity; Public Health, and Economic Development. The synthesis paper includes recommended metrics and regional open space actions to address each challenge. Appendix D also contains the five original white papers produced by ROSS staff and local experts, on open space related to: (D2) Climate Change; (D3) Biodiversity; (D4) Social Equity; (D5) Human Health and (D6) Economic Development.

Appendix E: Open Space Valuation Study for the Central Puget Sound Region

This study quantifies the value of the region's open spaces, as economic assets and their annual contributions to the region's economy. The study produced by Earth Economics uses the ROSS Open Space Services framework applied to land cover data to conservatively quantify values provided by regional open spaces. (see also Chapter 5)

Appendix F: Ecosystem Service Fact Sheets

Four summary studies on ecosystem service valuation related to our regional open spaces, produced by Earth Economics for the ROSS: (F1) "Ecosystem Service Values Lost from Land Conversion in the Central Puget Sound Region"; (F2) "Ecosystem Services Provided by Pierce County's Green Y"; (F3) "Return on Natural Capital Investment" and (F4) "Bicycle and Pedestrian Trails Build Resilience and Offer Broad Benefit".

Appendix G: Conversion to Conservation of Resource Lands

Examines the conversion of urbanizing resource lands through a case study. The study examined one of the Puyallup-White WOSS priority areas, the Green-Y southeast of Tacoma, focusing on the conversion pressures on existing agricultural and working forest resource lands. It demonstrated how much the expected future loss of these lands could cost, and recommends policy changes that could better conserve these lands within the Green-Y. These findings and recommendations have broader implications for the region, which have been summarized in a pamphlet (G2) for use by local governments to assist in reducing the conversion of working farm and forest lands.

Appendix H: Puyallup-White Watershed Open Space Strategy (WOSS)

This first “WOSS” identifies opportunities for enhancing stewardship and access to public lands, as well as priority areas for securing conservation lands. The report presents actions to achieve these goals in four categories: 1) ecosystems, especially aquatic systems and biodiversity; 2) health, active living and recreation; 3) resource lands and working landscapes; and 4) community and economic development. Regionally significant actions are synthesized into four geographically linked proposed strategies.

Appendix I: Green/Duwamish Stakeholder Involvement

The ROSS “Our Green/Duwamish” Team conducted focus groups, open houses, interviews and an online survey to collect contextual information from those knowledgeable about the Green/Duwamish Watershed, gather data and plans regarding the watershed, and identify potential actions to enhance its air, land, and water resources. The findings were consolidated into 75 ideas, and then further into a set of 39 key concepts that were considered by the Watershed Advisory Group.

Appendix J: Snohomish Watershed Open Space Strategy

The Snohomish WOSS Identifies broad strategies to guide open space conservation in the Snohomish watershed, based on extensive study of existing environmental and economic conditions, and through interviews and interactive workshops. The study also identified ecosystem service “hot spots” to inform planning. Staff coordinated with county, state, municipal and non-profit planners to create and evaluate spatial scenarios, to understand the multiple benefits of potential collaborative actions and proposals.

Appendix K: Regional Governance and Finance Report

A study and recommendations for implementation of the Regional Open Space Strategy for the Central Puget Sound provided by graduate students of the UW Evans School of Public Affairs. The paper presents case studies of regional governance mechanisms, evaluates financing mechanisms used in the Central Puget Sound, and suggests models for regional governance that would be viable to advance multi-benefit open space conservation and enhancement in the Central Puget Sound region.

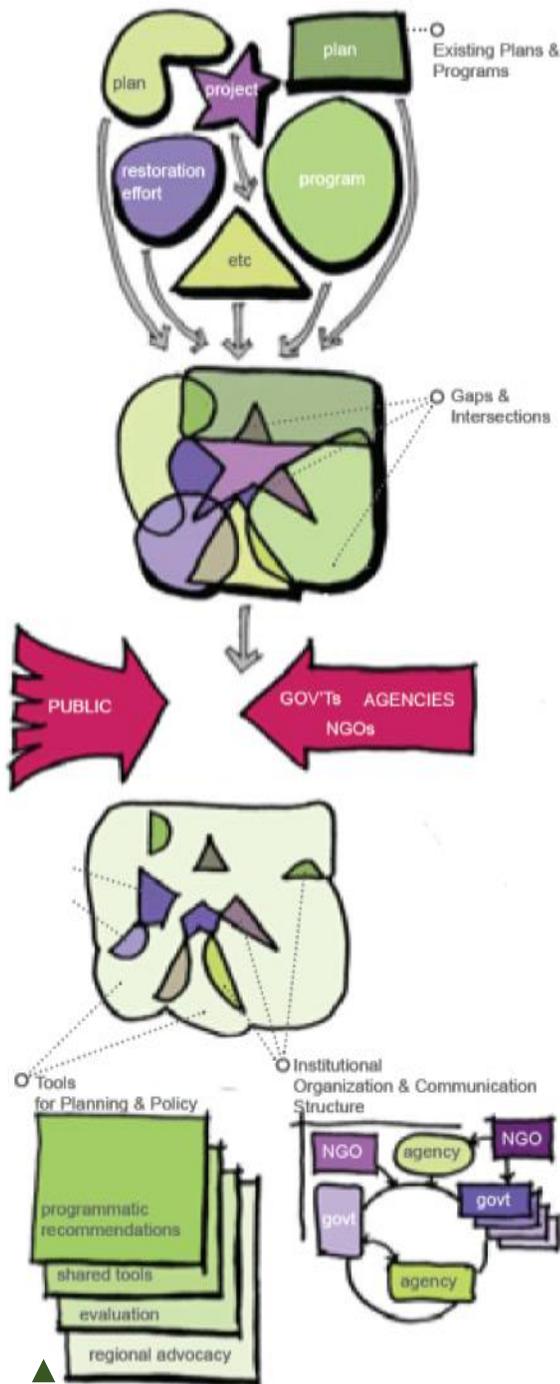
Appendix L: Open Space Services Assessment Tool

ROSS staff worked with the Trust for Public Land to inform development of an on-line web tool that provides information about the “open space services” provided by land cover in the Central Puget Sound region. The tool employs the ROSS Open Space Service Framework categories, and can convey data and reports on the benefits that specific land cover provides in relation to biodiversity, climate mitigation and adaptation, economy, social equity, and health. The tool includes current demographic data, and may be developed in the future to have the capacity to compare the benefits of various planning scenarios.

Appendix M VIDEOS: Regional Open Space Strategy for Central Puget Sound

To summarize and publicize the need for a Regional Open Space Strategy in an easily consumed format, ROSS staff worked with Resource Media and videographer Harley Pan to produce a short video that conveys the importance of our regional open spaces and utilizes a portion of the ROSS “flyover” video highlighting some of the most important regional lands needing conservation. More comprehensive 3-D modeling flyover video to integrate overlapping regional open space priorities was also produced by ROSS staff, and is contained in the ROSS archives.

Appendix A: Scoping Report_Summary



Original work flow diagram for the ROSS.

During the Scoping Phase the ROSS project team set out to identify and confirm with expert consultants the: need for a regional open space strategy; effective stakeholder engagement processes, analytical methods appropriate for the ROSS process, and the resources required to complete the ROSS.

Key Findings:

- Work must address a range of scales.
- The watershed is the proper unit of analysis because it responds to fundamental ecological processes and crosses political boundaries to secure collaboration.
- Throughout the Central Puget Sound there are many applicable plans and ongoing activities related to open space; the ROSS should support and coordinate with these rather than develop new projects.
- There is a critical need for a tool that assists funding entities in establishing priorities and responding to opportunities.
- Recreational, ecological, community development, resource management, public health, and educational objectives often dovetail so that there are efficiencies in the greater integration of efforts.
- The ROSS will be a reproducible planning framework that is modular and scalable through the production and publication of training programs and manuals.
- Need to identify institutional obstacles and develop strategies to effectively overcome them.
- Need to identify and establish effective organizational structures and pathways to conduct, institutionalize, and implement the ROSS.
- Need to proactively cultivate champions to build capacity for outreach, planning, and implementation.

Lessons Learned:

- There is robustness in working simultaneously at multiple geographic scales.
- There are conceptual benefits to using a watershed as a geographic scale of reference.
- There are practical and political benefits of housing a regional planning project in a university.
- There is an importance to balancing the time needed to conduct a “synthesis” with the need for a “strategy.”
- There are challenges in articulating a clear vision while remaining flexible, dynamic, and inclusive.

Appendix B: Technical Background Report

_Summary



▲
The four themes of the Technical Advisory Committees: *Ecosystems, Rural + Resource Lands, Urban + Community Development, Recreation + Trails*

This report compiled the work of four Technical Advisory Committees (TACs) focused on ecosystems, rural and resource lands, recreation and trails, and urban and community development, to inform the Preliminary Comprehensive Strategy.

In summarizing the work of the four TACs, the report synthesized the shared priorities, opportunities, and challenges across the open space network of the region, to articulate a vision for the region’s open space system.

The shared priorities included:

- *Robust and Resilient* - conserve, enhance, and manage regional open space assets and systems that are resilient to disturbances and can evolve over time;
- *Connected* - connect and integrate open space assets in terms of physical access to landscape and habitat types, ecological relationships, rural to urban geographies, and human to natural realms;
- *Diverse and Contextual* - provide a variety of precious open spaces, marine, and terrestrial landscape and ecosystem types, and functional systems tailored to different scales and community needs;
- *Multi-Functional* - layer objectives to address ecological integrity, ecosystem services, human health and well-being, resource conservation, and community vitality;
- *Stewarded* - foster a culture of stewardship;
- *Equitable and Accessible* - improve access for all citizens without degrading resources;
- *Coordinated* - improve cross-jurisdiction institutional coordination of open space efforts to address landscape scale objectives and upgrade the effectiveness of the system; and
- *Interdependent* - recognize mutual interdependence of wilderness, rural, and urban lands.

The primary shared challenges to achieve these priorities include: tax structure; limited funding and prioritization; gaps in analysis; limited public land ownership; vested development rights; political fragmentation; and inconsistent/ incomplete regulations/incentives.

Appendix C: Preliminary Comprehensive Strategy _Summary

STRATEGIC DIRECTIONS

The Technical Advisory Committees identified opportunities, challenges, and other guidance specific to each technical area. A shared set of challenges, goals, and opportunities were drawn from these findings. These Strategic Directions provide guidance on incorporating and supporting existing activities and tools, preparing data and information for analysis, and formulating a spatial and functional vision for the regional open space system that can be tested against local knowledge by engaging communities as the Watershed Open Space Strategies are developed.



ECOSYSTEMS



RURAL + RESOURCE LANDS



RECREATION + TRAILS



URBAN + COMMUNITY DEVELOPMENT



The goal of the Preliminary Comprehensive Strategy was to guide the development of the ROSS through seven Watershed Open Space Strategies, and ultimately the establishment of an integrated Regional Open Space Strategy that could be used to advance and coordinate regional-scale implementation mechanisms. The report focused on Ecosystems, Rural and Resource Lands, Urban and Community Development, and Recreation and Trails, and outlined how to create a robust, diverse, accessible, and connected regional open space system for the region. The document established:

VISIONS + VALUES: To create an integrated regional open space system celebrated and stewarded by current and future generations.

STRATEGIC DIRECTIONS: Outlined goals, opportunities, and near-term actions to pursue in response to a set of five challenges that were shared across the four technical areas.

ANALYTICAL TOOLS + GUIDING FRAMEWORKS: Utilize a diverse range of analytical tools and guiding frameworks to advance the project.

DEVELOPING AN ECOSYSTEM SERVICES VALUATION MODEL: Establish a model for valuing open space by engaging experts, highlighting limitations, and outlining a replicable framework.

COMMUNICATION + STEWARDSHIP: An additional set of opportunities and near term actions were established to assist the region in constructing a stewardship strategy and link conservation efforts at a regional scale.

WOSSs: General programmatic strategies and guidance for work to be conducted in the region's watersheds was planned based on local knowledge and existing plans to build local capacity to inform and implement the vision.

MODEL REGIONAL MAPPING: The spatial strategy was envisioned as a way to incorporate existing data, identify regional-scale project priorities, and outline a strategy to form spatial linkages that supported multiple layers of interest.

Original strategic direction of the ROSS.

Appendix D: Addressing Regional Challenges through Open Space_Synthesis + White Papers_Summary



▲
A sockeye salmon, an organism important to the region's biodiversity.

The region's natural assets are critical to the ecological, economic, and cultural vitality of the Central Puget Sound Region. The ROSS team convened an expert Ecosystem Services Committee to explore methods for identifying the services provided by regional landscapes, and identified five regional lenses through which to consider the values, metrics and opportunities for open space conservation. These lenses include the five contemporary regional challenges of biodiversity, climate change, human health, economic development, and social equity. Expert Task Forces researched and developed white papers on each of these topics, answering a set of three standardized questions for Part A of the papers:

1. What are the primary challenges facing [challenge lens] in the Central Puget Sound?
2. What is the relationship of open space to [challenge lens]?
3. Why is a regional approach to open space necessary in advancing objectives for [challenge lens]?

Part B of the papers suggests sets of metrics to evaluate the health and strength of open space to address each challenge lens, and assesses tradeoffs and co-benefits. Part C of most papers suggests regional actions to be taken. **It should be noted that the Recommended Actions, typically Part C in these papers, have not been vetted by agencies or individuals outside of the authorship committees**

This appendix contains a summary of the Ecosystem Services Committee's work and a synthesis of the white papers, plus the full white papers produced by each Task Force. It also contains an investigation of ecosystem service methods to inform conservation decisions.

D1: Valuing Open Space in Central Puget Sound: A Summary of the Ecosystem Service Committee and White Papers Synthesis **D2:** Open Space and Climate Mitigation and Adaptation
D3: Open Space and Biodiversity
D4: Open Space and Social Equity
D5: Open Space and Health
D6: Open Space and Economic Development
D7: Informing Conservation Decisions Based on Ecosystem Services

Appendix E:

Open Space Valuation Study

By Earth Economics for the ROSS

Central Puget Sound Open Space Valuation

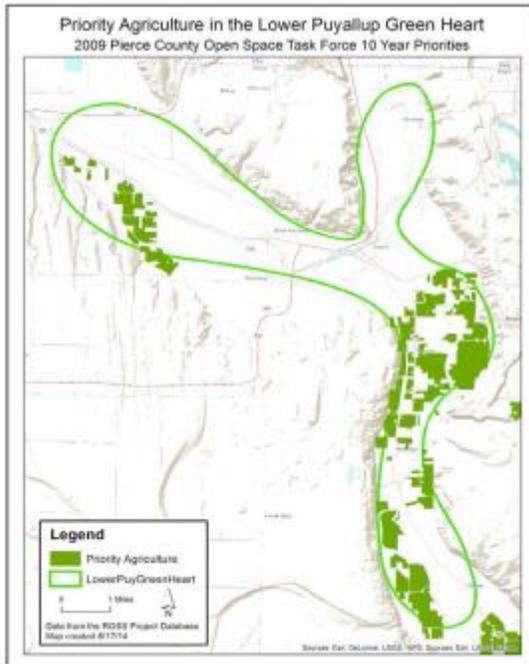


This study monetizes the value of Central Puget Sound's open spaces, using ten of the sixteen "open space services" as defined in the ROSS Open Space Services framework. Basing their estimates primarily upon regional land cover and using peer-reviewed studies to determine economic values, Earth Economics' study valued the region's open spaces to be between \$328 billion and \$825 billion, which if stewarded wisely would grow over the next 100 years to a value as high as \$2.6 trillion. Additionally, these ten open space services represent a substantial component of the regional economy, contributing between \$11.6 to \$25.2 billion annually. Because only ten of the sixteen open space services had sufficient background studies to inform reliable estimates, these values are considered as conservative.

Earth Economics' full report is contained in this Appendix.

Appendix F: Ecosystem Service Fact Sheets

By Earth Economics for the ROSS



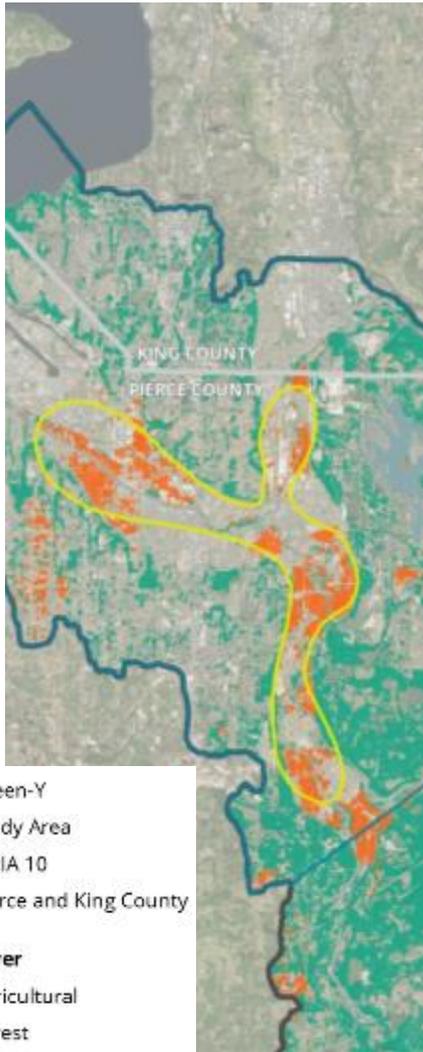
This section presents four summary studies on ecosystem service valuation related to our regional open spaces, produced by Earth Economics for the ROSS:

- (F1) "Ecosystem Service Values Lost from Land Conversion in the Central Puget Sound Region"
- (F2) "Ecosystem Services Provided by Pierce County's Green Y"
- (F3) "Return on Natural Capital Investment"
- (F4) "Bicycle and Pedestrian Trails Build Resilience and Offer Broad Benefit"



Priority Agricultural Land in the Puyallup-White Green Y

Appendix G: Conversion to Conservation in the Puyallup-White Watershed and Beyond + Brochure Summary



Existing forest and agricultural resource land cover within the Green-Y and broader Puyallup-White Watershed. Much of this is

G-1 The Green-Y Report examined 152,448 acres located southeast of the City of Tacoma within a priority area highlighted within the Puyallup-White WOSS. The report studied the existing agricultural and working timber resource lands in the area; how urban pressures are the primary driver of resource land conversion; the expected amount and location of losses and/or slight gains in resource lands based on future land use designations; the current regulatory climate that has allowed conversion to occur; and finally, the policy changes and incentives that could be implemented to better conserve resource lands within the Green-Y and the broader region.

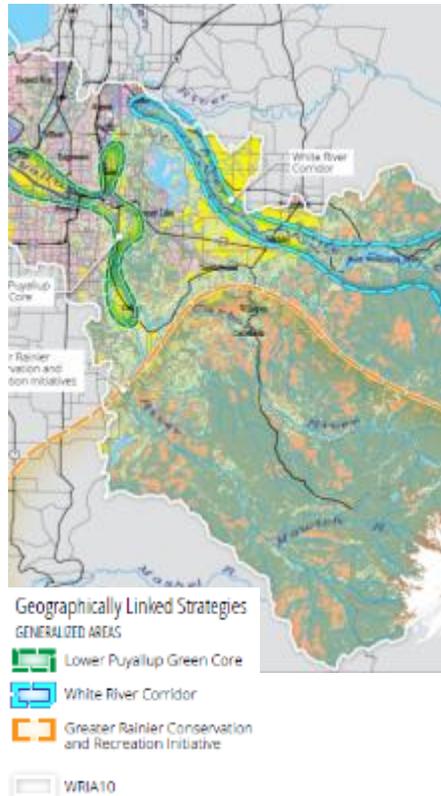
The economic value of the existing resource lands within the Green-Y are between \$83M and \$200M based on open space service values. If urban sprawl and other drivers of change continue unfettered in the study area, between \$82M and \$188M of this economic benefit could be lost due to resource land conversion. While both agricultural and forest resource lands have and are predicted to continue decreasing within the study area, forest lands have shown the most drastic decrease over time, and are at the highest risk to conversion into the future.

The regulatory climate around resource land conservation is vague and often conflicting between and within local, county, and state policies. This confusion has allowed resource lands to be converted to more developed uses. Perhaps the easiest resource lands to protect are in the Green-Y's rural areas outside of the UGA, and within cities such as Sumner and Fife with strong right-to-farm policies and beliefs. To conserve these resource lands, the regulations already in the books must simply be implemented. TDR programs should also be adopted within each city of the Green-Y, and be preferably, linked to a regional TDR program. The primary recommended changes to the state regulations, that will trickle down to county and local levels, are to remove ambiguities in resource designation criteria; allow for more flexibility in minimum parcel size; and develop criteria to allow for new and existing resource lands to be designated resource or open space within the UGA, where appropriate.

Success in the Green-Y could lead other areas within the region to want to better conserve their own resource lands, and this report could provide a scalable roadmap as well.

G-2 A brochure outlining pathways for municipalities to reduce conversion of working farm and forestlands in Washington State is also contained in this Appendix.

Appendix H: Puyallup-White Watershed Open Space Strategy (WOSS)_Summary



Geographically linked strategies proposed in the Puyallup-White WOSS.

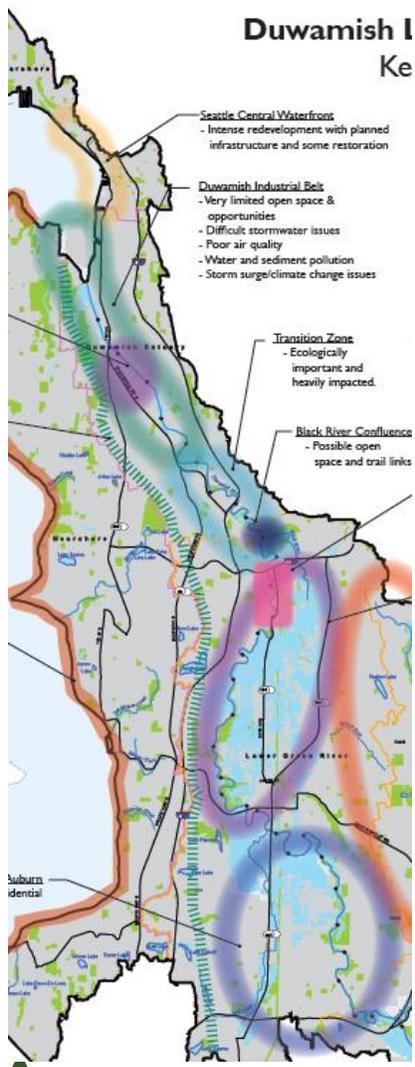
H-1 Completed in July 2014, the Puyallup-White Watershed Open Space Strategy (WOSS) was the first watershed planning study conducted by the ROSS team. The goal of the report was to identify opportunities for enhancing stewardship and access to public lands, as well as priority areas for securing conservation lands. The WOSS report presented four linked challenges to achieve these goals, which together comprised the key issues for the watershed. These challenges included 1) the health of aquatic systems, 2) biodiversity, 3) availability and access to healthy, active lifestyles for individuals and communities, and 4) viability of resource lands.

Through careful examination of these challenges, the ROSS team identified three priority locations where the challenges and associated opportunities overlapped geographically. These areas were named the Green-Y, located southeast of Tacoma; the White River Corridor, located around the White River; and the Greater Rainier Conservation and Recreation Initiative stretching from Mt. Rainier in the east, Highway 1 to the west, and nearly South Prairie to the North. It was concluded that focused actions within these areas could provide multiple open space services, and maximize conservation and stewardship resources for the benefit of the watershed and region on whole. The specific efforts recommended in the WOSS include:

- Combining trail and recreational development, shoreline restoration, and resource land conservation in the lower Puyallup River Valley would create a Green-Y for urbanized Pierce County. This Green-Y would provide breathing space, recreational opportunities, and community definition.
- Protection and enhancement of the forested lands along the White River and its tributaries would conserve one of the region's most ecologically important corridors.
- A collaborative program of public and private conservation/recreational development efforts would build on Mount Rainier National Park and nearby recreational activities to create an outdoor recreation area destination of regional if not national, stature.

The Report's Appendix also contains the Background and Opportunities Report for the Puyallup-White Watershed Strategy process.

Appendix I: Green/Duwamish Stakeholder Involvement Data and Mapping_Summary



Preliminary mapping of stakeholder input within the Green/Duwamish Watershed Listening Phase.

The engagement effort, also referred to as the “Listening Phase” of the project, was the first in a planned three-phase process to develop a Green/Duwamish Watershed Strategy that comprehensively connected ongoing efforts in the watershed.

As part of the Listening Phase, the Our Green/Duwamish Team conducted focus groups, open houses, and an online survey. The primary goals of these activities were to collect insights from those who knew the Green/Duwamish Watershed, gather contextual information and data regarding the watershed, and identify potential actions to enhance its air, land, and water resources.

Based on the input and direction of numerous participants in the Listening Phase, the ROSS team learned of more than 90 plans and programs that are potentially pertinent to advancing environmental and social well-being. 41 of these plans and programs were prioritized as key initiatives to be reviewed in greater depth.

The ROSS team then condensed this comprehensive content into about 75 consolidated ideas, and then further into a set of 39 key concepts reflecting the most important challenges and related opportunities in the watershed. These generally included:

- Existing plans, programs, and initiatives would benefit from enhanced coordination with other efforts in the watershed, and in the broader region.
- There are gaps within the planning and programming for human and ecosystem health, and this is true across both subject areas and geographic reaches.
- There are opportunities to better engage the public via outreach while projects are planned and carried out, to help mobilize individuals as volunteers, and to foster political will to increase funding and action.
- There are few conclusive analyses documenting problem areas within the watershed. User-friendly instructional toolkits could help facilitate implementation of watershed improvement actions by various interested agencies and individuals.

The Green Duwamish Watershed Strategy Documents include:

- Phase I Summary Memo
- Focus Group Summary Notes
- List of Plans and Programs
- Plans and Programs Inventory
- Challenges and Opportunities
- Synthesis Cards
- Synthesis Maps

Baseline Watershed Condition Maps are contained in the Project Archives.

Appendix J: Snohomish Watershed Open Space Strategy (WOSS)_Summary



Location of Snohomish watershed in the Central Puget Sound region.

The WOSS summarized the existing environmental conditions of the watershed to better understand how open space strategies could benefit the watershed. The WOSS also analyzed research on the existing policy framework, identified the watershed's open space services and regional challenges, and documented the perspectives of local experts.

An examination of the robustness of the existing open space system in the Snohomish watershed was also conducted to identify the system's ability to provide economic, social, and environmental benefits. Possible future scenarios differentiated by economic development approaches were prepared to determine what actions could be taken today to improve the open space system of tomorrow. The brief scenario analysis informed strategy development.

A general open space strategy and proposed action items were created based on the existing conditions and stakeholder input. These are summarized briefly below:

- Manage for fish habitat, farmlands, and flood control through support of the Snoqualmie Crossroads program.
- Identify agricultural lands that may have more value as habitat or flood reduction areas.
- Work with land owners to protect critical riparian habitats; assist them through regulatory and program adjustments; and explore joint management of forest land tracts for greater efficiency.
- Pursue land use regulations to protect small agricultural tracts and encourage agritourism. Explore TDR/PDR programs.
- Pursue the opportunity to establish "Community Forests" and provide community open spaces near the Highway 99 corridor in Snohomish County.
- Utilize the Scenic River Designation along the stretch of the Skykomish.
- Connect regional trails and fill missing gaps.
- Support MTS efforts, and utilize the model to create a Skykomish Scenic River Corridor Alliance, and a Snoqualmie Valley Coalition.

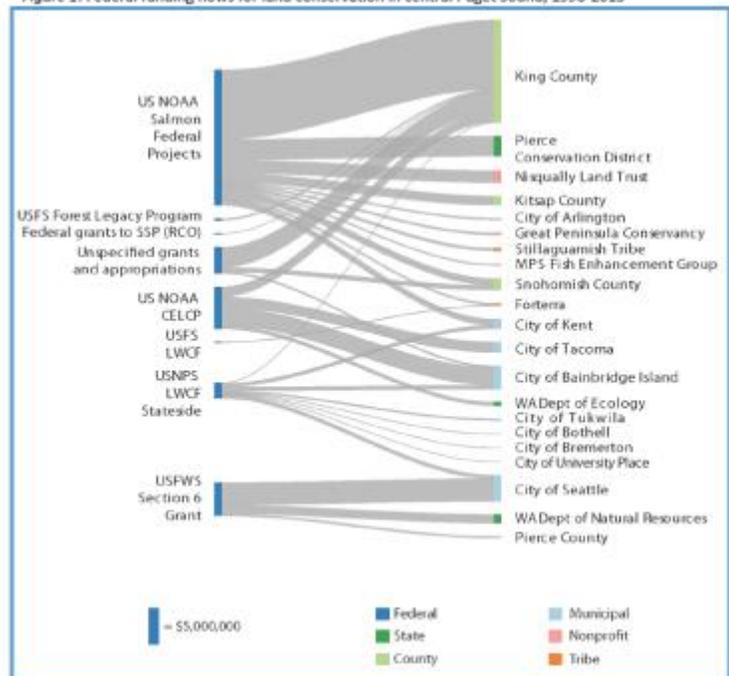
The Snohomish WOSS utilized a study by UW GIS Masters Students, "Spatial Analysis of Ecosystem Service Intensity in the Snohomish Basin, Washington" (Appendix A), which informed the scenario evaluation contained in Appendix E.

Appendix K: Regional Governance and Finance Study_Summary

The ROSS vision has been articulated to the point that further action requires a governance structure to translate the strategy into action. This study provided by graduate students of the UW Evans School of Public Affairs seeks to identify viable structures of collaborative governance to implement the ROSS that incorporate the diverse range of stakeholders, existing conservation efforts, and varied financing opportunities in the Central Puget Sound region.

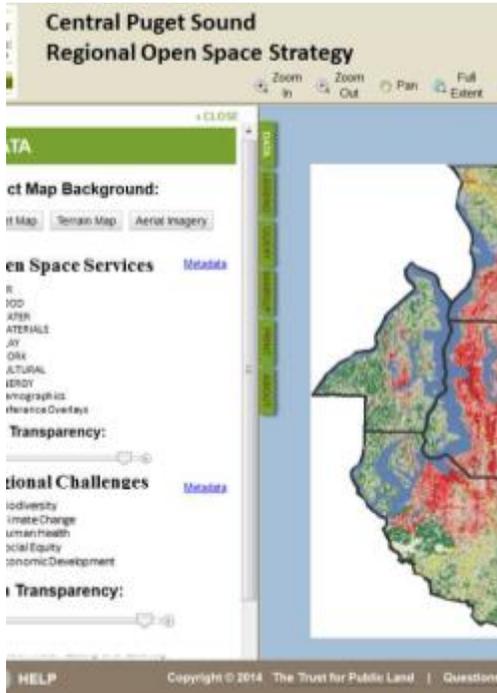
The paper, titled "Implementation of the Regional Open Space Strategy for Central Puget Sound," presents case studies of regional governance mechanisms, evaluates financing mechanisms used in the Central Puget Sound, and suggests models for regional governance that would be viable to advance multi-benefit open space conservation and enhancement in the region.

Figure 2: Federal funding flows for land conservation in central Puget Sound, 1998-2013



Federal funding flows for land conservation in Central Puget Sound 1998-2013.

Appendix L: Open Space Services Assessment Tool_Summary



ROSS staff worked with the Trust for Public Land (TPL) to inform development of an on-line web tool that provides information about the “open space services” provided by land cover in the Central Puget Sound region. The tool employs the ROSS Open Space Service Framework categories, and can convey data and reports on the benefits that specific land cover provides in relation to the regional challenges of biodiversity, climate mitigation and adaptation, economy, social equity, and health. The tool includes current demographic data, and may be developed in the future to have the capacity to compare the benefits of various planning scenarios. The tool can be accessed at

<http://tplgis.org/ROSS/>

User name: open

Password: space



Partial screenshot of the online Open Space Service Assessment Tool developed by TPL, emanating from the ROSS Ecosystem Services Committee and white paper authors’ work.

Appendix M VIDEOS: Regional Open Space Strategy for Central Puget Sound Video and Modeled Flyover_Summary

To summarize and publicize the need for a Regional Open Space Strategy in an easily consumed format, ROSS staff worked with Resource Media and videographer Harley Pan to produce a short video that conveys the importance of our regional open spaces and utilizes a portion of the ROSS “flyover” video highlighting some of the most important regional lands needing conservation. The video can be accessed at:

<https://docs.google.com/uc?id=0B0yVrhCjH3EUnBYVnY2OWIGZzA&export=download> and at:

www.openspacepugetsound.

Slide of the ROSS flyover, showing a moment highlighting critical interconnected regional open space patterns.

More comprehensive flyover video using 3-D modeling to show how the green infrastructure system can address interconnected priorities at the regional level was also produced by ROSS staff. That video footage is contained in the ROSS archives.





**Weaving Together
Watershed Priorities**

**A REGIONAL OPEN SPACE STRATEGY
FOR THE CENTRAL PUGET SOUND REGION**