



## **Regional Challenges**

### **Overview Paper: Biodiversity**

Regional Open Space Strategy (ROSS)



## **BIODIVERSITY - PROBLEM STATEMENT AND CONNECTION TO OPEN SPACES**

### ***What are the primary challenges facing biodiversity in the Central Puget Sound?***

Biodiversity can be described as the sum of all life forms and their associated biological processes — the diversity of genes, individuals, species, communities and ecosystems (King County Biodiversity Report, 2008; Washington Biodiversity Council, 2007). The Central Puget Sound's varied ecosystems, including its marine shorelines, mesic forests, and riverine and wetland systems, provide for a rich biodiversity. These ecosystems and associated species deliver key ecological services to the region: vital economic benefits in agriculture, forestry, and fisheries; health benefits such as clean water and flood control; and many cultural and recreational benefits that enrich the lives of our citizens.

In the last century, population expansion and land development in the Central Puget Sound have negatively impacted the area's biodiversity through habitat loss and ecological disruption (Hepinstall et al., 2008; Krukeberg, 1991). Many historical factors are responsible for the degradation, including: habitat fragmentation, housing growth, agricultural expansion, invasive species, logging, reduction in surface and groundwater, and shoreline armoring and pollution. As human population and land development pressures have grown, so has the need to actively manage our biological resources.

In addition to land use changes, there also are social and governmental challenges to protecting and restoring biodiversity in the Central Puget Sound. Though the residents of the region generally support species and habitat protection, the current management of biodiversity is siloed among different jurisdictions and government agencies, often making it difficult to plan for, or respond efficiently to, threats at regional scales. Some argue that planning processes, such as those afforded through the Growth Management Act and Critical Area Ordinances do not adequately address long-term biodiversity conservation. Many important biodiversity areas are located near population centers that are undergoing sprawling development on private lands. This "urban sprawl" causes loss of biodiversity and diminished ecological services, the loss of which negatively impacts society at large. Compounding these challenges is the emerging issue of global warming, widely recognized as a serious threat to biodiversity and ecological health (Staudinger et al., 2013; Travis, 2003).

Five primary challenges facing biodiversity protection in coming years in Central Puget Sound will be to: 1) understand and address threats to regional biodiversity with prioritized, results-driven actions; 2) apply ecological principals to land use

management at multiple spatial scales; 3) plan for a future that conserves biodiversity as part of sustainable development; 4) identify indicators and create monitoring system that reveals whether strategies are protecting biodiversity or not, and if not, manage adaptively to continuously improve; and 5) develop a citizenry that values protecting a rich, regional biodiversity.

### ***What is the relationship of open space to biodiversity?***

The ROSS describes open space as: “an embracing term for a diverse spectrum of lands across a rural and urban continuum on large and small scales. Traditionally open space may be imagined as wilderness lands or public parks, but it also encompasses resource lands for agricultural and timber production, wetlands and water bodies, local and regional recreational trail systems, as well as urban green spaces like parkways, rain gardens, and green roofs.” From the perspective of biodiversity conservation, considering open space more broadly than just wilderness lands or public parks is especially noteworthy because it expands the number of sites for biodiversity protection.

Open space as defined by ROSS provides the primary area for all species, habitat and ecological interactions. 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. Depending on design, a wide variety of open space types, ranging from wild lands to golf courses to backyard gardens, can contribute various elements to regional biodiversity (Blair, 2007; Blair and Launer, 1997; Donnelly and Marzluff, 2004; Goddard et al., 2010). Wild lands provide the best habitat for many species, but our suburban yards can support avian diversity (Marzluff, 2014), or even recreational sports fields when properly designed can provide habitat for plants, insect pollinators and many species of animals. In the Central Puget Sound it is increasingly important to conserve biodiversity across and within the entire urban to rural landscape.

In largely developed landscapes like Central Puget Sound, open space harbors most biodiversity (Crooks et al., 2004; Donnelly and Marzluff, 2004). And the species, habitats and ecosystems found in these open space lands deliver critical ecological services to the region. Current and future planners especially focus on protecting biodiversity in priority open space areas, such as rare and threatened habitats, riparian zones, floodplains, steep slopes and wildlife corridors. Planners also typically wrestle with how to design open space that balances apparently conflicting uses like recreation versus managing for biodiversity and ecological services; finding win-win designs are key.

The ecological value of individual open space lands, such as parks and protected areas, is highly dependent on both the characteristics of open space itself (e.g. size and habitat quality) and the landscape context surrounding the open space (Crooks et al., 2004; Donnelly and Marzluff, 2004; Prugh et al., 2008; Soule et al., 1988; Williams et al., 2006). The characteristics of the landscape in which open space is embedded is critical because it affects whether that space is ecologically isolated or connected to the broader ecosystem. “Ecological connectivity” is defined as “the

degree to which the landscape facilitates or impedes plant and animal movement” (Taylor et al., 1993). Urban development impedes the movements of many sensitive species (Soule et al., 1988), but providing habitat corridors through developed landscapes can help protect these sensitive species (Collinge, 1998; FitzGibbon et al., 2007; Kadlec et al., 2008). This spatial concept of ecological connectivity is especially timely in the face of climate change and the growing need for species to be able to move to track suitable climates (Heller and Zavaleta, 2009). Simply put, well-managed, connected open space provides greater value to biodiversity protection and resilience than unconnected lands (Dale and Haeuber, 2001).

Open space in the Central Puget Sound is vitally important as the region continues to grow. A reduction in the amount or quality of open space will result in biodiversity loss and degraded ecological services. Loss of biodiversity would have reverberating, negative impacts on the region's economy, health and culture – including leaving the region with less resilience for unanticipated future environmental challenges like those resulting from climate change. Additionally, there could be an added burden to public resources as more species are added to the federal or state endangered species lists.

The future of biodiversity and regional sustainability can be improved by applying key ecological principles to land use planning and management (for example, see Dale and Haeuber, 2001). Open space planning guidelines that help protect biodiversity include:

- Provide resilience for long-term change and unexpected results.
- Protect the largest, most intact, and contiguous habitats possible for local plants and animals.
- Ensure the focus of open space protections includes ecosystems and landscape diversity.
- Protect connectivity by providing wildlife corridors and other connections between open space (habitat) patches for animal and plant dispersal, and long-term species migration.
- Preserve rare landscape elements, critical habitats, and associated species.
- Minimize introduction or spread of nonnative species.
- Manage access to and use of open space to minimize the impacts on biodiversity.
- Examine the impacts of local decisions in a regional context.
- Implement adaptive management strategies for the stewardship of biodiversity on open space.

### ***Why is a regional approach to open space necessary in advancing objectives for biodiversity?***

In the Central Puget Sound, biodiversity management of open space usually focuses on habitat and species at local spatial scales by local jurisdictions. No single location can adequately protect regional biodiversity. Rather, providing a resilient landscape that can maintain biodiversity over the long-term requires protecting a network of

connected open space lands as well as managing the surrounding landscape across large spatial scales (Franklin and Lindenmayer, 2009; Margules et al., 2002). To adequately protect the breadth of biodiversity in the region—and to be true to the definition of biodiversity— one must consider a regional approach that addresses all spatial scales and levels of biological diversity, from genetic to ecosystem diversity.

The Washington Biodiversity Council (2007) commended the ongoing efforts to conserve Washington’s biodiversity on the part of federal, state, and local governments as well as nonprofits, citizens, and the private sector. The most important contribution of a regional approach to open space planning and biodiversity conservation would be to better coordinate and further develop these individual efforts.

Additional advantages for biodiversity of a regional open space strategy include:

- Increases efficiency and reduces costs.
- Many threats need to be addressed at regional scales.
- Regionally important open space areas may differ from locally important areas.
- Coordinating goal setting and actions across jurisdictions can have greater impact.
- Linking biodiversity management to other human activities that span jurisdictions, such watershed protection and recreation can be more effective.
- Addressing connectivity requires working across political boundaries.

The Central Puget Sound includes four counties and over 100 municipalities that have individual policies, regulations and programs. Effective management of biodiversity in Central Puget Sound requires an approach that spans spatial scales and political boundaries. Historically, land use planning only took into account local and site-specific scales. The declining biodiversity in the Central Puget Sound (Washington Biodiversity Council, 2010) calls for better local and regional protection, especially in the context of an expanding human population and changing climate. It is especially important to understand that benefits of biodiversity reach beyond single jurisdictions. For example, Seattle residents ought to understand that they have a vested interest in biodiversity protection in the Cascade foothills of eastern King County for the economic, health and recreations benefits it brings to the city and the region.

Finally, it must be recognized that species of concern in the Central Puget Sound, such as salmon and large carnivores, require conservation efforts not only at site, local and regional scales, but also at state, national and global scales. A successful biodiversity conservation effort for the Central Puget Sound needs to connect to conservation programs beyond our regional boundaries.

## **SUMMARY/PERSUASIVE CLOSING STATEMENT**

Preserving open space for the support of biodiversity will require regional strategies for: knowledge management and goal setting; public engagement and support; policy-supported investments, and integrating biodiversity concepts widely across

many public interest sectors. It will take an especially concerted effort to educate decision makers and key public audiences of the essential need for a regional open space strategy that fully protects biodiversity and its associated ecological services. These benefits serve the Central Puget Sound human population by, among other things, sustaining resource economies, providing clean air and water, offering recreation opportunity, and presenting a mitigation and adaptation approach to climate change impacts.

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