Redmond Climate Resiliency and Sustainability Vegetation Management Plan

City of Redmond, Washington

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Science + Planning + Design

Prepared for
City of Redmond

Prepared by
Herrera Environmental Consultants, Inc.

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Climate Resiliency and Sustainability
Vegetation Management Plan
City of Redmond, Washington

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EXECUTIVE SUMMARY

Introduction

The City of Redmond (Redmond) has been at the forefront of sustainability and resource protection initiatives, with longstanding commitments and planning efforts to protect the natural environment, reach carbon neutrality, and prepare for climate impacts. This Climate Resiliency and Sustainability Vegetation Management (CRSVM) Plan builds on those efforts with a focus on supporting the climate resiliency and sustainability of natural systems managed and maintained by the city. Vegetation—including trees, shrubs, flowers, and grasses —plays a critical role in the entire Redmond ecosystem.

What do **climate resilience** and **sustainability** mean in terms of **vegetation management?**

Climate Resilience. The capacity of the natural environment to prevent, withstand, respond to, and recover from a disruption (U.S. Climate Resilience Toolkit 2021).

Sustainability. Fostering practices that reduce pollution, waste, and damages to the natural environment with the objective of having a healthy environment with resources to exist for future generations (Redmond Environmental Sustainability Plan 2020).

This CRSVM Plan is an opportunity to take a forward-looking, cross-departmental approach to strengthen strategies and collaboration around vegetation management. As climate impacts and development continue, adapting practices for city-managed vegetation will aid Redmond in sustaining an environment that is healthy and resilient to climate impacts and disruptions, while maintaining resources for future generations. The strategies outlined in this plan are not prescriptive. Rather, they focus on enhancing Redmond's ecosystems by providing a menu of options with suggested species and planting locations. The process of implementing actions will be iterative and need continued staff coordination and adaptive management as Redmond grows and climate change continues.

Goals and Objectives

The CRSVM Plan builds on existing vegetation, sustainability, and climate-related planning efforts including the Tree Canopy Strategic Plan (Redmond 2019), Environmental Sustainability Action Plan (ESAP; Redmond 2020b), 20-Year Forest Management Plan (Green Redmond Partnership 2009), Climate Emergency Declaration (Redmond 2020a), and Climate Vulnerability Risk Assessment (Redmond 2022). The CRSVM Plan supports many existing vegetation focused goals including:

- Achieve 40 percent tree canopy coverage by 2049 (Tree Canopy Strategic Plan/ESAP)
- Achieve 2,600 acres of accessible habitat and wetlands by 2050 (ESAP)

The three primary goals of the CRSVM Plan were determined by Redmond staff at the kick-off:

1. Identify and develop citywide vegetation management strategies, projects, and initiatives that increase Redmond's overall sustainability and climate resilience, are implementable, and align with existing plans.
2. Strengthen interdepartmental communication, alignment, and collaboration on vegetation management—including clear roles for action implementation—for coherent and consistent citywide vegetation management.
3. Identify and prioritize available land for future tree planting and rewilding.

What is **rewilding?**

Rewilding is the restoration of an area of land to increase biodiversity and restore its natural processes. This CRSVM Plan focuses on five types of rewilding in Redmond:

- Naturalized meadows
- Roadside meadows
- Pollinator gardens
- Wetlands
- Understory

Strategies and Actions

The CRSVM Plan is a roadmap that provides options and phasing to aid departments across Redmond in moving towards implementation of actions. The 10 actions identified are organized by four overarching themes: education and outreach, maintenance practices, rewilding, and tree canopy. Each action includes a description and intended benefits.

The bulk of the actions focus around expanding rewilding areas and tree canopy throughout Redmond through adopting new native and climate-resilient species lists, restoring and transitioning areas to more diverse ecosystems, and centralized documentation of activities. Each type of vegetation community has detailed information on what it is, why it is included, scale, maintenance needs, ecosystem services provided, examples, and potential mapped locations.

Conclusions and Recommendations

Successful execution of this CRSVM Plan will require implementation planning, defining success metrics, monitoring, and adaptive management. Transitioning to more sustainable and climate-resilient landscaping and maintenance practices will be a process, implemented over many years in graduated steps. Each new project provides the opportunity to experiment, adapt, and learn in order to refine the approach. Parks, rights-of-way (ROW), and other City-owned properties have the potential to accommodate more natural plant communities, without losing outdoor recreational values and functions. Taking these proactive steps now will increase Redmond's climate resilience and sustainability, while also adding aesthetic, wildlife, and economic benefits for Redmond residents.

Meadow flowers. Photo credit: Northwest Meadowscapes.

Understory and tree planting. Photo credit: Green Redmond Partnership.

Naturalized meadow. Photo credit: Bellevue Botanical Garden.

Pollinator garden. Photo credit: The Spokesman-Review.

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INTRODUCTION

The City of Redmond (Redmond) has been a leader in restoration, urban ecosystem management, and environmental sustainability. As Redmond continues to develop and experience the impacts of climate change, it recognizes the need to have a forward-looking plan for vegetation management. Redmond contracted with Herrera Environmental Consultants (Herrera) and Cascadia Consulting Group (Cascadia) to develop this plan in collaboration with Redmond staff. Building on previous successes, this Climate Resiliency and Sustainable Vegetation Management (CRSVM) Plan outlines a roadmap for increasing the sustainability and climate resilience of ecosystems in Redmond.

Where We Are Now

Redmond's Ecosystem

Historically, the land that is now Redmond was largely covered with mature Douglas-fir (*Pseudotsuga menzesii*) forest, with large swaths of wooded wetland and pasture (Redmond 2010). Today, the city supports a population of over 73,000 and has about 38 percent tree canopy cover. Major ecosystems in Redmond include over 4,000 acres of forest as well as wetlands and natural areas. The 20 watersheds within the city have many fish-bearing streams that support populations of salmonids and other native fish species (Redmond 2019). Redmond forests have a significant proportion of relatively short-lived deciduous trees such as bigleaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*). Some parts of the forest understory are dominated by invasive species, including Himalayan blackberry (*Rubus armeniacus*), English ivy (*Hedera helix*), and Scotch broom (*Cytisus scoparius*) (Green Redmond Partnership 2009).

Current Vegetation Management

Redmond manages a diverse array of ecosystems across public property, including rights-of-way (ROW); parks and trails; the Redmond Watershed Preserve; and other city-owned and managed facilities including natural areas; stream corridors and waterways; landscaped beds; green stormwater infrastructure; street trees; urban forests; turf grass; and pollinator gardens. Multiple departments, divisions, and groups play a role in vegetation management, especially Planning, Public Works, and Parks and Recreation. These roles are as follows:

- Code and Policy: Planning Department
- Forestry Oversight: Parks, Trails, and Recreation Commission
- Planting and Maintaining Vegetation (in the ROW): Parks and Recreation – Operations Division, Public Works – Streets Division, Public Works – Stormwater Division
- Planting and Maintaining Vegetation (on public lands): Parks and Recreation – Green Redmond Partnership, Parks and Recreation – Operations Division, Public Works – Environmental & Utility Services, Public Works – Operations Division

Significant and Successful Work

Redmond has many ongoing and planned activities related to sustainable vegetation management practices. Guiding plans include the Tree Canopy Strategic Plan (Redmond 2019), the Environmental Sustainability Action Plan (ESAP; Redmond 2020b), the Climate Emergency Declaration (Redmond 2020a), and the Climate Vulnerability Risk Assessment and Strategy (Redmond 2022).

The consultant team reviewed previous planning documents and held an internal Strengths, Weaknesses, Opportunities, and Threats (SWOT) workshop with Redmond staff in September 2023, to identify previous, current, and future vegetation-related activities (Appendix A). Through the review of activities, several themes emerged in Redmond's vegetation management strategies. Table 1 lists each theme and provides a description of their strengths and weaknesses.

Table 1. Themes in Redmond's Vegetation Management Strategies.

Theme	Strengths	Weaknesses
City Alignment	**Support for climate change measures.** To date, Redmond has conducted numerous planning efforts related to climate preparedness, resilience, and sustainability and has political support from Redmond leadership and city council for work focused on vegetation management.	**Vegetation management can be disjoined and inconsistent.** It is managed by multiple departments and there can be conflicting priorities and projects.
City Staff	**Staff team with strong technical expertise.** Redmond staff are educated about vegetation management, have many years of experience, and are highly skilled (e.g., arborists, horticultural, natural resources management).	**Resistance to change and lack of continuity.** ● Some staff may be resistant to changes in maintenance practices. ● Additional arborist staff are needed. ● As staff leave the city, there can be a large knowledge gap.
Community Programs (e.g., Green Redmond Partnership, Washington Conservation Corps)	**Boost capacity for vegetation planting.** The Green Redmond Partnership leverages community volunteers and has been a big contributor to planting trees and shrubs throughout Redmond. It is funded by the Parks and Recreation and Public Works Departments. Public Works – Stormwater Division funds a full time Washington Conservation Corps (WCC) crew that plants and maintains projects.	**Future resources and capacity.** As the Green Redmond Partnership program is less supported by Forterra, it may become resource constrained and be less impactful.
Data Collection and Adaptive Management	**Robust data collection.** Redmond has a strong collection of existing data and strong data collection measures already underway, focused on tree canopy, street trees, and noxious weeds. Data informs goals and management practices to meet those goals.	**Future funding and data sharing and digitizing.** ● Updates to LiDAR and aerial imagery datasets do not have consistent funding sources. ● There is a lack of centralized data for sharing across departments and projects. ● Some data is not digitized or on GIS.
Education and Outreach	**Strong education and outreach programming and communication.** Redmond staff are knowledgeable and a credible resource for messaging.	**Outreach for any changes in land use or maintenance practices.** Changes in maintenance practices, land use, or levels of service will require education and outreach to residents and Redmond staff to encourage buy-in.

Table 1 (continued). Themes in Redmond's Vegetation Management Strategies.		
Theme	**Strengths**	**Weaknesses**
Native and Climate Resilient Plants	**Existing plans and programs emphasize native species and biodiversity.** This is evident through current plans, restoration project performance standards, invasive species removal, and the Ecological Score Card.	**Lack of clear resources for plant selection.** ● Native plants are not always the most drought resistant or low maintenance and climate zones are shifting. ● Website lacks recommended Street Tree List and 'user friendly' guidance for homeowners and others about BMPs for tree planting, approved plant lists, etc. ● Lack of internal resources for species selection.
Maintenance Practices	**Support for innovation.** Maintenance practices are regularly being updated and improved and seek to promote sustainability.	**Need for reduced maintenance.** Many areas (e.g., ROWs and turf areas in parks) require extensive maintenance. Many tools are still gas powered.
Pest Management	**Integrated pest management (IPM) program.** The Parks & Recreation and Public Works Departments have cut inputs and maintenance time through implementing proactive, preventive, and cultural measures. IPM practices are supported by the Climate Emergency Declaration.	**Reliance on herbicide.** There is still reliance on some herbicides for vegetation maintenance. Herbicides are used minimally in turf grass areas and more frequently in open landscaped areas and for noxious weed management.
Rewilding, Naturalized Meadows, and Pollinator Gardens	**Strong community support.** In the recent Parks, Art, Recreation, Culture & Conservation Plan (PARCC Plan; Redmond 2023b), more than 80 percent of respondents indicated support for "rewilding," expanding tree canopy, or allowing select areas to be naturalized.	**Lack of identified areas and a need to balance priorities.** ● Redmond does not yet have a plan for how or where to implement this. ● A program like this would need to reduce maintenance time and costs, inputs, and maintain sight lines.
Tree Canopy	**Trees and tree canopy are a major focus and point of pride for Redmond.** ● Plans to increase canopy to 40 percent by 2049. ● Community likes and wants more tree canopy. ● Tree mitigation fund supports replanting efforts.	**Existing canopy threatened and lack of identified areas for expansion.** ● Increased residential development, especially along transit corridors results in tree removal. ● Need to decrease mortality and preservation of existing trees. Existing trees are at conflict with utilities and sidewalks. ● Lack of centralized information on areas to replant or plant more trees. ● Desire for more conifer trees. ● No easily identifiable 'user friendly' guidance for homeowners on tree planting and native plants.

What Is Changing

Community, Demographic, and Land Use Trends and Impacts

Changes in Redmond's communities, demographics, and land use trends are expected and could impact vegetation management. These trends are identified in the PARCC Plan (Redmond 2023b) and include:

Population growth. By 2050, Redmond may be home to up to 83 percent more residents and support a larger workforce. Additional residents and commuters will increase the demand for and use of green spaces and recreational spaces across Redmond.

Development. Development is projected to increase to accommodate the growth of residents and jobs—especially in the urban growth centers (Downtown, Marymoor Village, and Overlake) and through in-fill development. Increased development can encroach on natural areas and open spaces and create challenges for maintaining and expanding tree canopy cover and ecosystem services.

Diversity. The diversity of the population is increasing with more people of color and people who speak languages other than English. Educational materials and projects may need to consider potential language barriers as well as varying cultural and spiritual practices around trees, vegetation, and use of open spaces.

Climate Change Trends and Impacts

The climate is already changing and will continue to do so, affecting vegetation survival and management activities in Redmond. Previous assessment and planning efforts including the ESAP (Redmond 2020b), Climate Vulnerability Risk Assessment and Strategy, and Climate Vulnerability Index (Redmond 2022) outline primary climate change trends. Each will impact ecosystems and vegetation management activities in different ways.

Temperature. Average summer temperatures are expected to increase while summer soil moisture will decrease. Higher than average temperatures could alter the growing season for plants; increase risk of plant disease, pests, and invasive species; increase irrigation needs; and stress trees and landscaping that are not well adapted to drought conditions.

Extreme Heat Days. The average number of days per year with extreme high temperatures is projected to steadily increase over time. Higher temperatures can create unsafe conditions for staff to conduct vegetation-related maintenance.

Precipitation. Annual precipitation is expected to increase, with the greatest increases during the wet season. In addition, storms are expected to be more intense. Heavier precipitation could increase risk of flooding.

Wildfire. While Redmond has a relatively low risk of wildfire compared to other parts of the region, increasing smoke and poor air quality are a public health concern that could impact vegetation-related maintenance schedules.

Where We Are Going

Redmond has a long history and strong commitment to climate action. With the current and future stressors of increased development and climate change, it is important that Redmond look ahead and adopt practices that support climate resilience and environmental sustainability. This CRSVM Plan builds on that commitment and supports Redmond in advancing the protection and enhancement of its ecosystems and resources in innovative ways that support a beautiful and thriving environment for all.

Redmond already has many goals that support environmental sustainability and resilience including:

- Achieve 40 percent tree canopy coverage by 2049 (Tree Canopy Strategic Plan/ESAP)
- Achieve 2,600 acres of accessible habitat and wetlands by 2050 (ESAP)

Climate Resilience. The capacity of the natural environment to prevent, withstand, respond to, and recover from a disruption (U.S. Climate Resilience Toolkit 2021).

Sustainability. Fostering practices that reduce pollution, waste, and damages to the natural environment with the objective of having a healthy environment with resources to exist for future generations (Redmond Environmental Sustainability Plan 2020).

GOALS AND OBJECTIVES

Redmond staff and the consultant team held an internal kick-off meeting to identify project goals on September 7, 2023. During that kick-off meeting, Redmond staff identified the following goals:

- Identify and develop citywide vegetation management strategies, projects, and initiatives that increase Redmond's overall sustainability and climate resilience, are implementable, and align with existing plans.
- Strengthen interdepartmental communication, alignment, and collaboration on vegetation management—including clear roles for action implementation—for coherent and consistent citywide vegetation management.
- Identify and prioritize available land for future tree planting and rewilding.

What is **rewilding?**

Rewilding is the restoration of an area of land to increase biodiversity and restore its natural processes. This plan focuses on five types of rewilding in Redmond:

- Naturalized meadows
- Roadside meadows
- Pollinator gardens
- Wetlands
- Understory

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STRATEGIES AND ACTIONS

Development of strategies and actions for the CRSVM Plan stem from conversations with Redmond staff at four workshops in late 2023 and early 2024. The first workshop included a SWOT assessment. Follow up workshops focused on tree canopy, rewilding, and management practice opportunities. In addition, the consultant team conducted a literature review of existing plans and policies to identify emerging trends and gaps. Findings from the literature review are in the 'Where We Are Now' and 'What is Changing' portions of the Introduction section of this document. Appendix B contains a more detailed list of gaps, opportunities, and potential future strategies that were not included in this plan text.

Final strategies in the CRSVM Plan focus on **education and outreach, maintenance practices, rewilding**, and **tree canopy**. The team identified 10 actions to improve climate resiliency and environmental stewardship of Redmond's vegetation management practices (Table 2). The sections following Table 2 provide additional detail on the rewilding and tree canopy strategies and actions. All strategies and actions will need to be supported through the implementation phase, which is discussed in the Conclusions and Recommendations section. Successful implementation includes creating a cross-department steering committee to lead the work.

Education & Outreach

Conduct public outreach and engagement regarding upcoming actions in the CRSVM Plan.

Maintenance Practices

Adjust maintenance practices to reduce emissions, pesticides, and staff time.

Rewilding

Rewild available city-owned and managed lands, restoring and transitioning landscapes to more diverse and native ecosystems.

Tree Canopy

Increase tree canopy on city-owned and managed lands by planting diverse and well-adapted trees, especially where there is low tree canopy cover.

Table 2. Vegetation Management Strategies and Actions.

EDUCATION AND OUTREACH

Conduct public outreach and engagement regarding upcoming actions from the CRSVM Plan. *Include Redmond residents by communicating proactively about the need for change and the benefits to the community and the environment.*

Action Description	Benefits
E1. Communication. Communicate about the CRSVM Plan through the use of toolkit materials and by leveraging existing community programs and related PARCC (Redmond 2023b) and ESAP (Redmond 2023a) plans (see Education & Outreach Toolkit).	• Early implementation • Community engagement

MAINTENANCE PRACTICES

Adjust maintenance practices to reduce emissions, pesticides, and staff time. *Changes to maintenance practices can be a win-win for staff and the environment.*

Action Description	Benefits
M1. Leaf Management. Where feasible, retain fallen vegetation debris on site. Place leaf, branch, and tree debris in garden beds, meadows, understory areas, and tree rings of developed parks and natural areas. This reduces effort needed to manage leaves and natural debris, and provides natural mulch, wildlife habitat, and erosion and weed control. On lawns, mulch leaves in place with a mulching mower when leaf fall is not too heavy. These maintenance practices reduce time, effort, and emissions needed to transport leaves and branches for cutting off site, while improving habitat on site.	• Reduce long-term maintenance burden • Reduce emissions • Improve wildlife habitat • Support nutrient cycling and soil formation • Reduce erosion • Reduce evaporation • Suppress invasive vegetation
M2. Integrated Pest Management. Continue to decrease use of pesticides and herbicides and embrace alternative pest- and weed-control methods. For over a decade, Park Operations has reduced chemical reliance and incorporated innovative management techniques such as flame and manual weeding, coarser mulch, and the Foamstream weeder instead of pesticides. Redmond can continue to build on this across departments, recognizing that some instances may still require the occasional use of chemical pesticides and herbicides.	• Reduce reliance on pesticides and herbicides • Support pollinators • Promote growth of native vegetation
M3. Electrification. Continue electrifying the Redmond's fleet and maintenance equipment. In combination with reducing overall use of gas-powered fleet and maintenance equipment, Redmond can pursue battery-powered and electric equipment to reduce emissions related to vegetation management.	• Reduce emissions • Reduce localized noise pollution • Improve air quality

Table 2 (continued). Vegetation Management Strategies and Actions.

REWILDING

Rewild available city-owned and managed lands. *Restore and transition existing high maintenance or challenging areas to more diverse native ecosystems.*

Action Description	Benefits
R1. Rewilding Species Lists. Adopt rewilding project planting lists available to all departments that focus on native and climate resilient plants. Planting lists are tailored for different ecosystems including naturalized meadows, roadside meadows, pollinator gardens, wetlands, and understory (see **Appendix C** for rewilding lists).	• Early implementation option • Community engagement • Improve cross-departmental communication
R2. Rewilding Expansion. Convert high maintenance areas with challenging access, and/or under-utilized areas, including turf grass, to rewilding. (Full maps are in **Appendix E**; documentation of GIS mapping to create maps is in **Appendix F**).	• Increase maintenance team safety • Add visual interest and color • Reduce localized noise pollution • Community engagement • Reduce long-term maintenance costs • Reduce long-term water usage • Reduce reliance on pesticides and herbicides • Vegetation resiliency
R3. Tracking. Keep data on rewilding activities in a centralized location, including where, what, and how an area is restored and maintenance needs and activities. Maintain updated rewilding species lists. Maintaining this information is important for adaptively managing the ecosystem, adjusting over time, and measuring success.	• Community engagement • Improve cross-departmental communication • Measure successes • Vegetation resiliency

TREE CANOPY

Increase tree canopy cover on city-owned and managed lands. *Plant diverse and well-adapted trees in available areas, especially where there is low existing tree canopy.*

Action Description	Benefits
T1. Tree Species Planting Lists. Adopt updated tree project planting lists that focus on native and climate resilient species. Tree planting lists are focused on the type of planting area and include street trees, landscape trees, and naturalized area trees. Lists may be provided to developers seeking tree planting mitigation (see **Appendix D** for tree canopy lists).	• Early implementation option • Community engagement • Improve cross-departmental communication
T2. Tree Canopy Expansion. Expand tree canopy in areas of low existing tree canopy and where space is available, in alignment with achieving 40 percent tree cover by 2049 as development continues (ESAP 2019). (Full maps are in **Appendix E**; documentation of GIS mapping to create maps is in **Appendix F**).	• Add visual interest • Community engagement • Reduce long-term maintenance burden • Reduce long-term water usage • Reduce reliance on pesticides and herbicides • Vegetation resiliency
T3. Tracking. Maintain information on tree canopy expansion activities in a centralized location, including where, what, and how an area is planted. Maintain updated tree species planting lists. This data is key for adaptive management, making adjustments over time, and measuring success.	• Community engagement • Measure successes • Improve cross-departmental communication • Vegetation resiliency

Rewilding and Tree Canopy Expansion

"Rewilding" is an ecological strategy that restores an area of land to increase biodiversity and reestablish natural processes. In the recent PARCC plan community engagement, more than 80 percent of respondents indicated support for rewilding, expanding tree canopy, or allowing select areas to be naturalized (Redmond 2023b). In Redmond, rewilding encompasses multiple vegetation communities including naturalized meadows, roadside meadows, pollinator gardens, wetlands, and understories (Table 3). Expanding rewilding in Redmond could include restoring turf grass, underutilized natural areas, invasive species-dominated locations, challenging areas to access, steep slopes, and/or paved areas to specific ecosystems with native and climate-resilient plants. Embracing rewilding opportunities goes hand in hand with maintaining landscape functions and aesthetics.

The strategies and actions identified for rewilding (R1, R2, R3) and tree canopy (T1, T2, T3) mirror each other. Both include adopting and continually updating species lists developed specifically for this CRSVM Plan that emphasize native and climate-resilient plants that are well-adapted for current and future conditions. Note that native plant species are not necessarily always the best-adapted species for drought, disease, and/or low maintenance, but contribute to habitat and biodiversity goals. For any site, selecting a diversity of species is important to support long-term resilience. Updating and maintaining these lists in a centralized location will allow for adaptation citywide as climate change affects Redmond and new science emerges about what plant species are most appropriate for current and future conditions in the Pacific Northwest.

Expanding tree canopy and rewilding areas will rely on potential locations identified through GIS mapping completed for this Plan. Potential locations include ROWs, utility corridors, public parks, natural areas, and other facilities owned by the City of Redmond. School properties, while not owned by the city, are included for future collaboration opportunities. Locations were determined through collaborative workshops with Redmond staff in November and December 2023, as well as screening based on feasibility. Full maps are in Appendix E and assumptions and documentation are in Appendix F, which includes guidance on how to update mapping over time. Redmond is working on a parallel wildlife habitat plan that once adopted, may have synergies with this plan, including in the identification of additional areas for wildlife habitat.

Table 3. Rewilding and Tree Canopy Overview.					
Vegetation Community	**Primary Plants**	**Why Important**	**Scale**	**Relative Maintenance**	**Benefits [a]**
Naturalized Meadow	Herbaceous forbs and grasses, including native grasses and wildflowers, with some sparse shrubs/trees.	Rare ecosystem with historical range in Redmond. Public interest.	Variable; minimum area 400 square feet	Moderate	
Roadside Meadow	Native, herbaceous forbs and grasses.	Opportunity to diversify vegetation, improve maintainability, and increase benefits.	Strips with minimum widths of 5 feet	Low	
Pollinator Garden	Native, "nativars," and ornamental plants that are nectar and pollen-producing to attract pollinating animals.	Lacking habitat for essential pollinators. Public interest.	Small (100 square feet minimum)	Moderate to High	
Wetland	Native grasses, shrubs, and trees that thrive in waterlogged soils.	Degraded and resilient ecosystem that provides numerous benefits.	Variable; depending on extent of wetland area	Moderate to High	
Understory	Native herbaceous plants, shrubs, and immature trees that thrive in the shade or partial sun provided by the above tree canopy.	Critical to healthy forest ecosystem and increases resilience of tree canopy with successional plantings.	Variable; depending on extent of forested area	Moderate to High	
Tree Canopy	Mature trees.	Part of Redmond identity; vital to increase to reach 40 percent tree canopy in Redmond by 2049. Public interest.	Variable; from single street tree to forest stand	Moderate	

[a] As compared to turf grass or invasive species cover.

Air Quality	Carbon Storage	Community Engagement	Erosion Reduction	Flood Regulation	Wildlife Habitat	Nutrient Cycling & Soil Formation	Pollination	Temperature Reduction	Water Quality
									

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Naturalized Meadows

Description: Meadows and prairies are diverse and dynamic habitats dominated by herbaceous plants, including native grasses and wildflowers. Trees or shrubs may sparsely populate naturalized meadows if these areas maintain an open character. Naturalized meadows can be upland or wetland of various sizes. Naturalized meadows may include areas of existing lawn that are no longer mown or have reduced mowing needs, as a means of encouraging native and naturalized wildflower species to germinate, bloom, and self-seed.

Why Included? Meadows and prairies are diverse ecosystems and home to many species of plants and animals. Once common in the South Puget Sound region, these ecosystems are now one of the rarest (WDFW 2024) and will be important to creating a resilient Central Puget Sound region in the future. Meadows provide food and habitat for pollinators and other beneficial wildlife. Meadow vegetation improves water quality, water infiltration, and air quality. Meadows also provide open space, wildlife corridors, bird watching, and aesthetic value.

Planting Locations: Naturalized meadows can be planted at many different scales, with the smallest at 400 square feet. Current turf grass areas with steep slopes, damp areas, or where mower access is challenging may be especially good candidates for naturalized meadows to increase staff safety. In addition, areas on the margins of lawns, play fields, and trails may be well suited. Figure 1 shows areas of identified opportunities for naturalized meadows and future rewilding efforts.

Maintenance Needs:

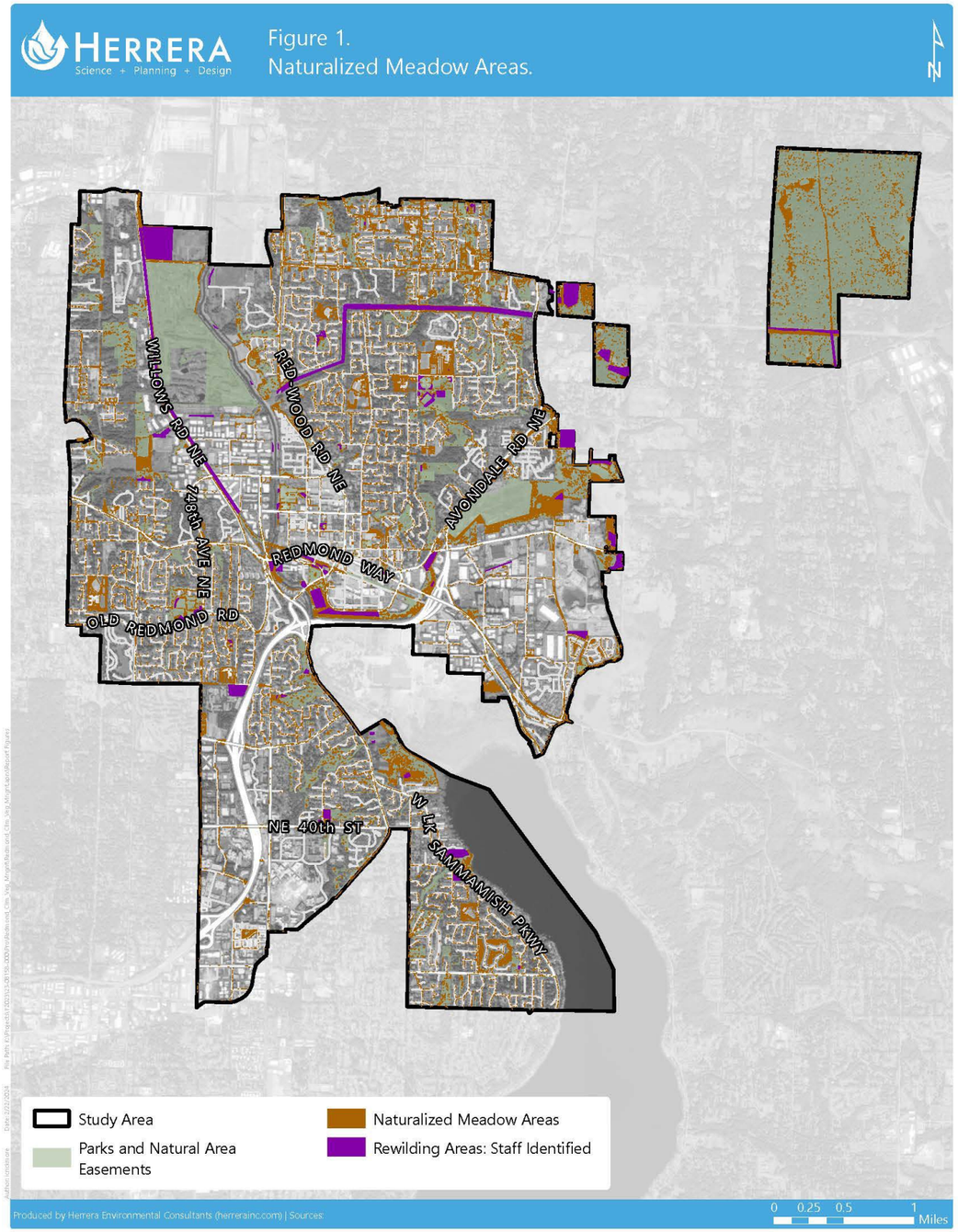
- Disturbance regime: mowing or grazing
- If mowing, avoid nesting times (fall or winter when flowers are not blooming); mow slow and use a flushing bar
- If mowing, can create public interest with mown walking paths through the meadow
- Mow around perimeter with same regularity as adjacent lawns to exhibit ongoing care and maintenance
- Invasive species removal
- Reseed as needed
- Monitoring

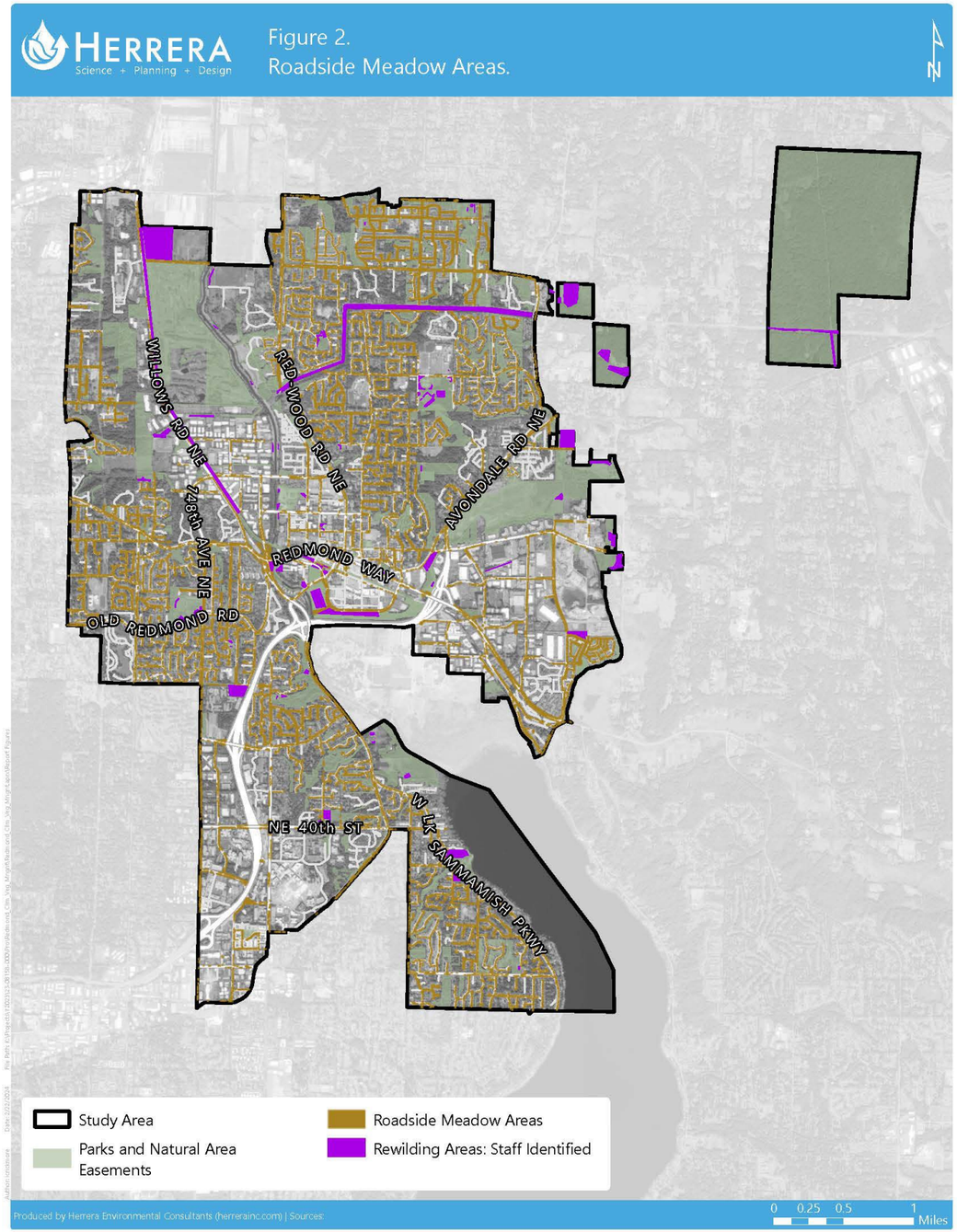
Potential Challenges:

- Invasive plant species management
- Public perception – Area may look more wild and less maintained than traditional turf grass

Naturalized meadow at the City of Seattle Magnolia Substation. (Photo credit: Christina Orrino)

Urban naturalized in South Lake Union, Seattle, Washington (Photo credit: Studio Matthews)





Roadside Meadows

Description: Roadside meadows are ROW areas established and maintained as long blooming wildflower areas and natural meadows. Long blooming wildflower areas are composed of custom species mix best suited to the individual characteristics of a site and will provide for the longest bloom period possible. Transitioning roadside landscapes into roadside meadows leads to reduced maintenance efforts and improved biodiversity.

Why Included? Currently, ROW maintenance requires a high amount of staff resources. Transitioning turf areas to lower maintenance plantings would be a win-win for maintenance and pollinators. Roadside meadows are important because they serve as wildlife habitat providing food, shelter, and space. If they are connected to other undeveloped spaces, they help wildlife safely move. Roadside meadows provide environmental benefits including improving water quality and infiltration, air quality, and shade. Flowering plant species provide additional pollinator resources. Roadside meadows also add aesthetic value for drivers and neighbors.

Planting Locations: ROW areas within Redmond. Ideally, roadside meadows would cover a stretch of road, connecting other meadows and pollinator gardens in a wildlife corridor. A good opportunity to implement roadside meadows could be as roadways are in need of renovation and landscaping is needed. Figure 2 shows areas of opportunity for roadside meadows and future rewilding efforts.

Maintenance Needs:

- Invasive plant species removal
- Disturbance regime: minimal mowing or grazing
- If mowing, avoid nesting times (fall or winter when flowers are not blooming); mow slow and use a flushing bar
- Line trimming and pruning to ensure visibility is maintained
- Reseed as needed
- Monitoring

Potential Challenges:

- Invasive plant species management
- Continued maintenance
- Public perception – area may look more wild and less maintained than traditional turf grass

Roadside meadows in Rotherham, UK (Photo credit: Rotherham Council)

Native Pacific Northwest wildflower in a soil berm parking strip (Photo credit: Northwest Meadowscapes).

Pollinator Gardens

Description: Pollinator gardens are gardens that are planted specifically with flowering plants that provide nectar or pollen for a wide range of pollinating insects. A pollinator is anything that helps carry pollen from the male part of the flower to the female part of the same or another flower. Pollinators are the drivers of healthy ecosystems, facilitating the movement of pollen for plants to produce fruits, seeds, and ultimately, other young plants.

Why Included? Pollinator gardens support the pollinators that play a vital role in producing the plants around us and the food that we eat. Almost 80 percent of all crops grown around the world require pollination by animals (Forest Service 2024). However, many pollinators are currently threatened and in decline. Human activities, pesticides, pollution, nonnative species, and climate change have reduced their habitats and food sources. Pollinator habitats need to be protected, created, and near each other to support healthy ecosystems. Pollinator gardens can also contain plants that have food security, cultural or ethnobotanical values.

Planting Locations: Pollinator gardens do well in highly visible areas as they can provide many educational opportunities and aesthetic benefit. They can also be planted at a variety of scales, including small spaces down to 100 square feet. Figure 3 shows areas of opportunity for pollinator gardens and future rewilding efforts

Maintenance Needs:

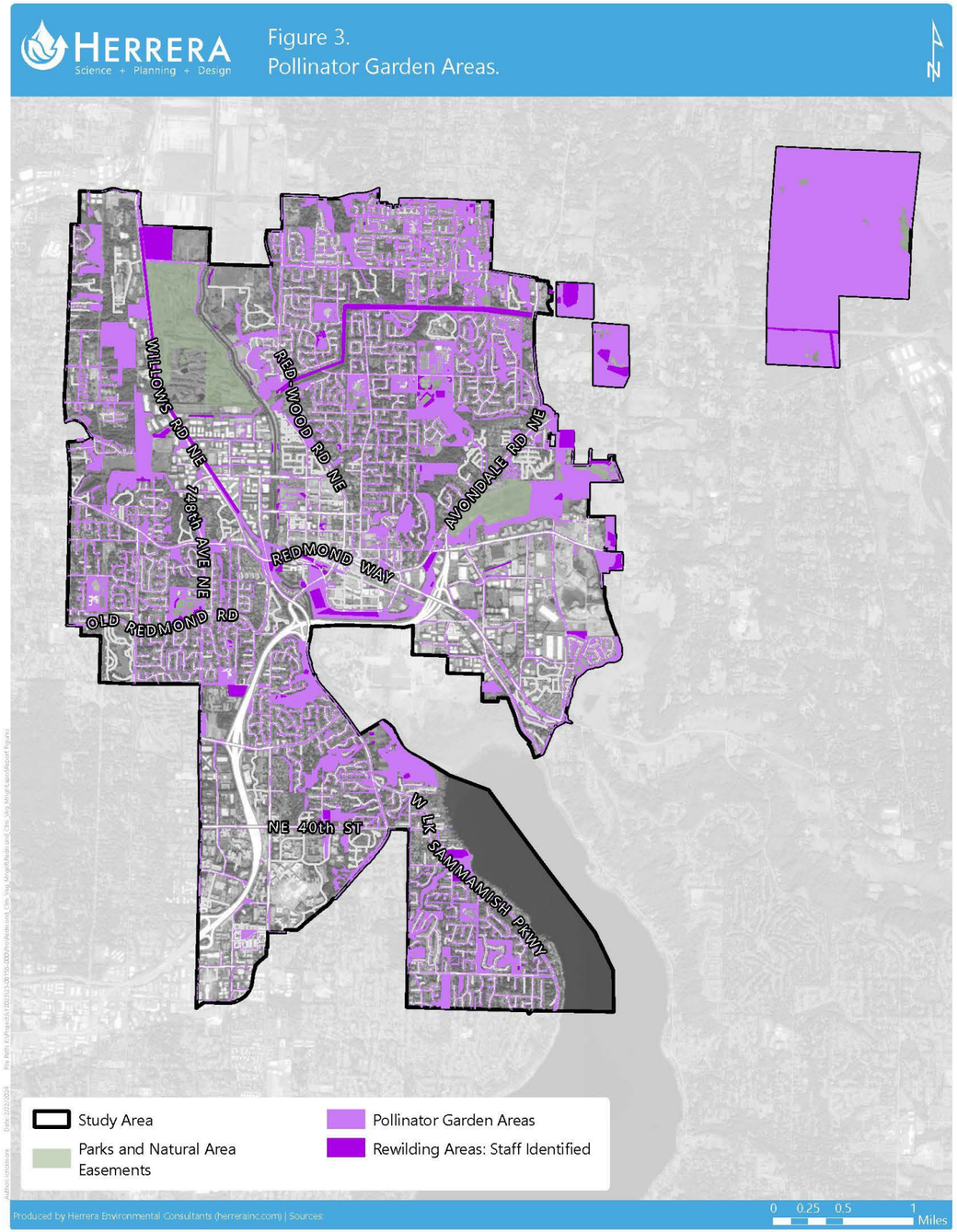
- Irrigation
- Annual reseeding
- Trimming to keep pathways clear
- Invasive plant species removal
- Apply mulch as needed (see M1 as potential source for mulch)
- Monitoring

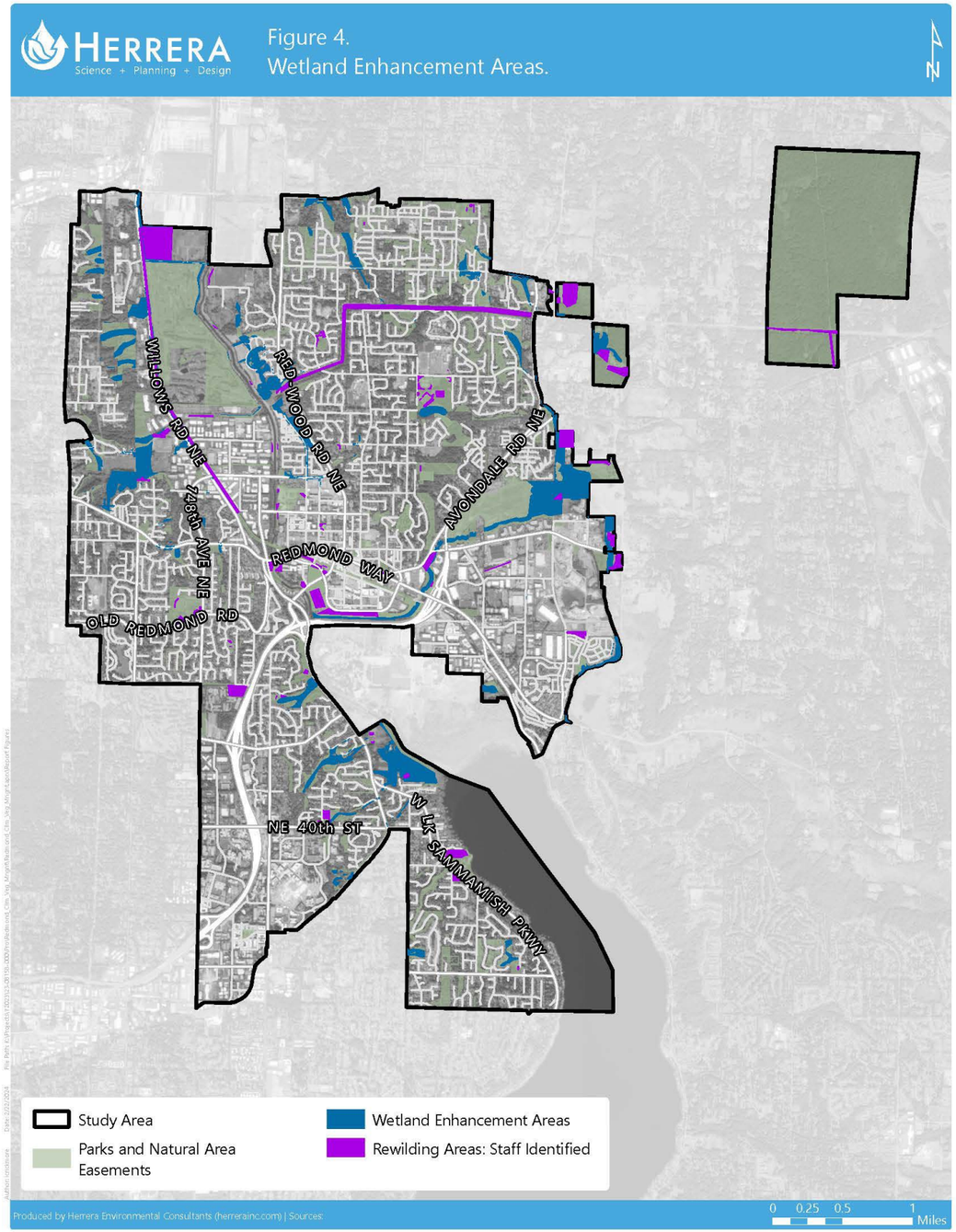
Potential Challenges:

- Invasive plant species management
- Protection against rabbit and deer predation during establishment
- Preventing foot traffic during establishment
- Continued maintenance

Pollinator gardens in Spokane, Washington
(Photo credit: Susan Mulvihill/the Spokesman Review)

Roadside pollinator gardens in Seattle, Washington
(Photo credit: Pollinator Pathway Toolkit)





Wetlands

Description: Wetlands are areas where water is present either at or near the surface of the soil for part of or all of the year and are characterized by herbaceous plants, shrubs, and/or trees that thrive in saturated or flooded soils. Wetland enhancements create more native plant cover and diversity within an existing wetland system. Enhancements include removing invasive plant species and planting water-tolerant herbaceous plants, shrubs, and/or trees. By enhancing a wetland, we can improve its ability to function, address flooding and support water quality treatment.

Why Included? Wetlands are highly diverse and productive ecosystems that provide a range of benefits including water quality improvement, erosion control, maintaining stream flows, sequestering carbon, and providing habitat for wildlife, including threatened and endangered species. Redmond has been doing extensive work in recent decades to restore and enhance wetlands.

Planting Locations: Wetland enhancements will be well-suited in areas with invasive species presence and/or poor canopy cover. Figure 4 shows areas of opportunity for wetland enhancements and future rewilding efforts.

Maintenance Needs:

- Invasive plant species removal
- Monitoring

Potential Challenges:

- Invasive plant species management
- Protection against predation during establishment

Wetland in Redmond. (Photo credit: City of Redmond)

Wetland in Magnuson Park, Seattle. (Photo credit: Park Preview)

Understory

Description: Forest understory refers to the layer of vegetation beneath the main canopy of a forest and is typically composed of an assortment of seedlings and saplings of canopy trees together with specialist understory shrubs and herbs.

Why Included? A healthy understory contributes to a healthy ecosystem, and in turn, a healthier urban environment. Understory planting ensures the forest can generate, by creating a sustainable environment for native tree saplings to grow. Shrubs and groundcover create a variety of habitats for different species of animals, plants, moss, lichen and fungi. A healthy understory improves local animal and plant diversity and can help create corridors where wildlife can safely and securely travel through the underbrush.

Planting Locations: Areas of existing or planned tree canopy expansion, especially those in important habitat areas, those dominated by invasive species, and those where successional plantings may be needed. Figure 5 shows areas of opportunity for planted understory and future rewilding efforts.

Maintenance Needs:

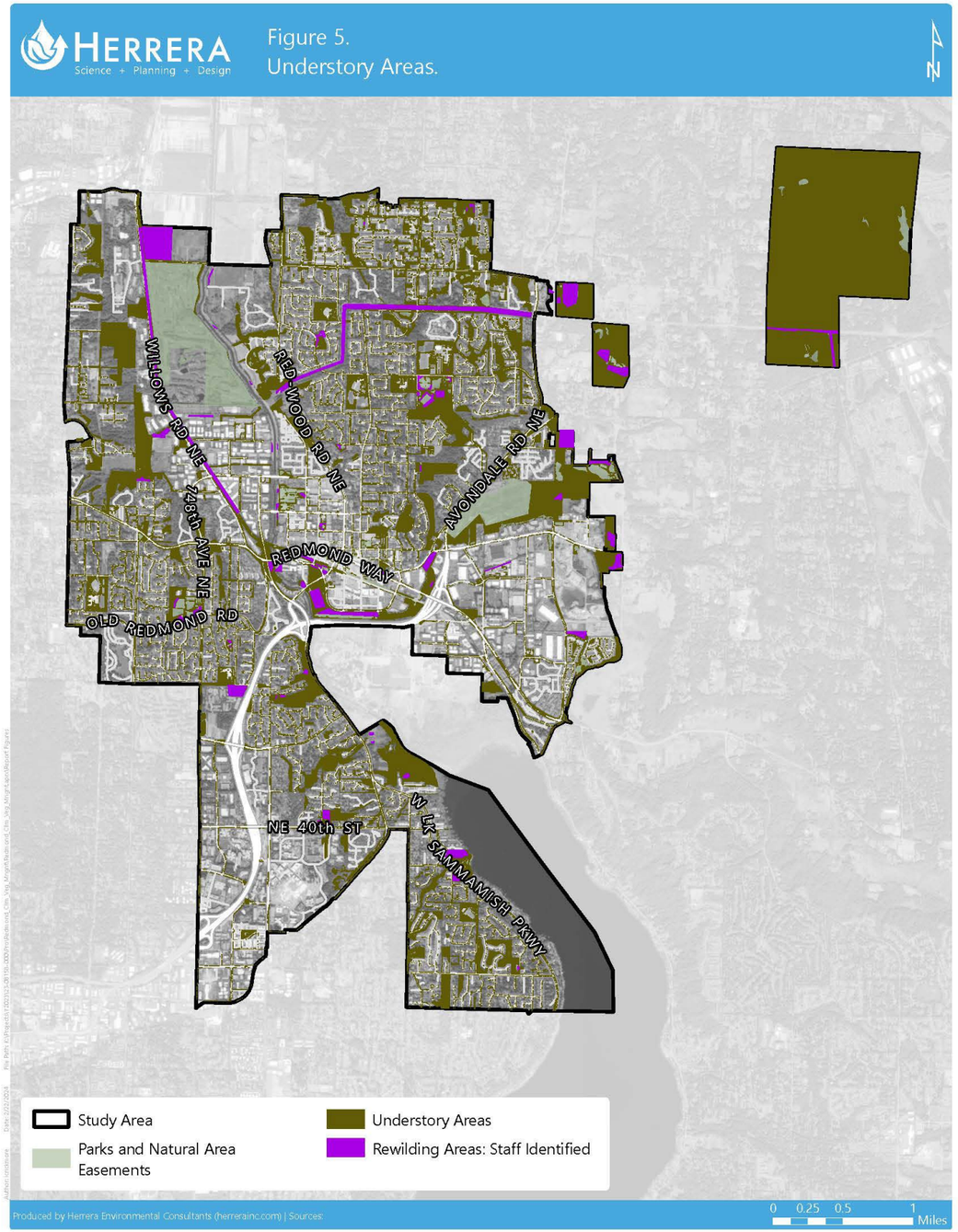
- Irrigation for first 3 years of establishment
- Monitoring
- Invasive plant species removal

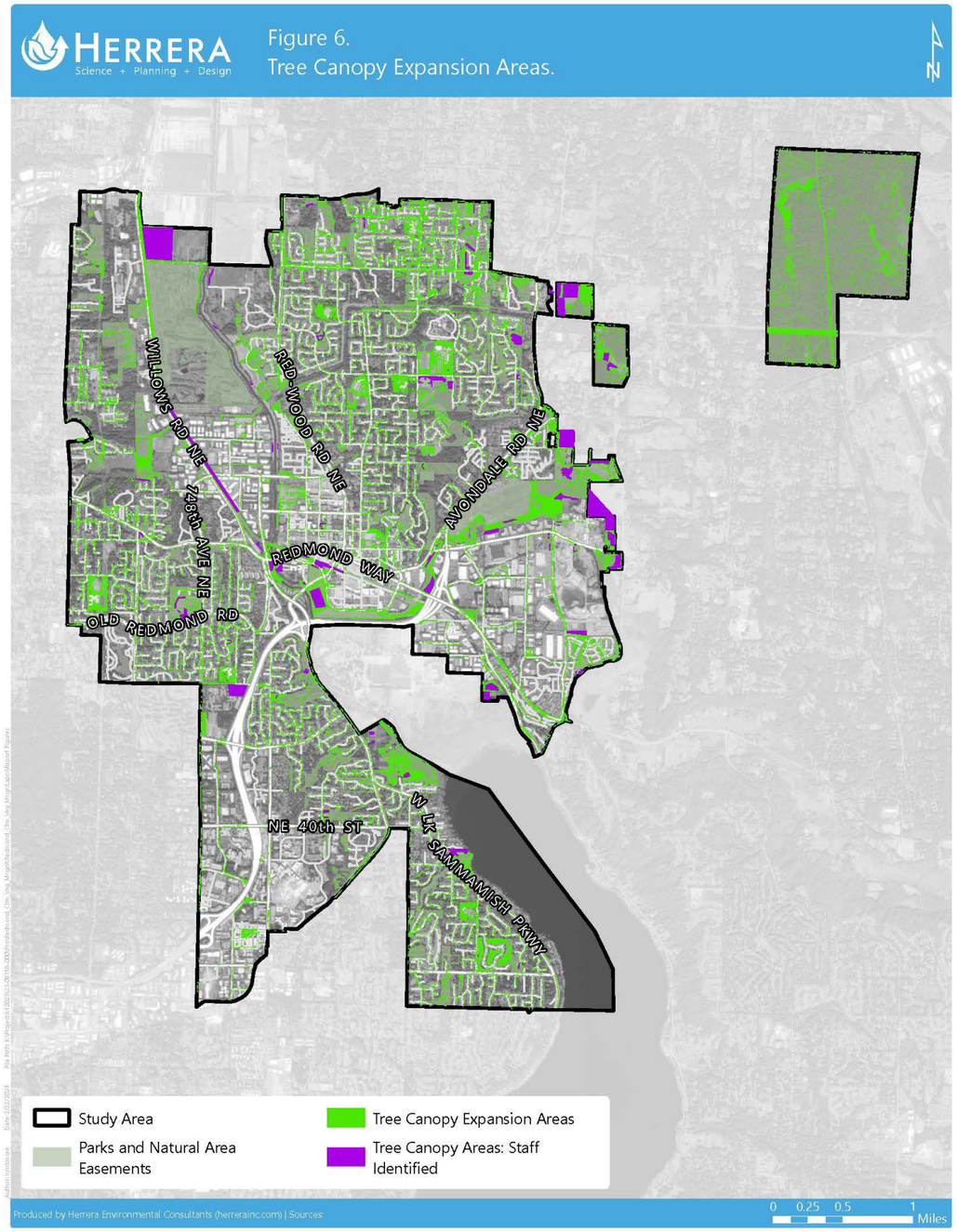
Potential Challenges:

- Invasive plant species management

Understory at the NE 116th Mitigation Site Project in Redmond (Photo credit: Herrera)

Understory along SR 167. (Photo credit: Herrera)





Tree Canopy

Description: The tree canopy is the dense ceiling of closely spaced trees and their branches, providing shade below and habitat for various animal species.

Why Included? In urban settings, tree canopies play a crucial role in enhancing environmental quality, public health, and overall livability. They contribute significantly to temperature regulation by providing shade, thereby reducing the urban heat island effect and mitigating high temperatures in densely built areas. Additionally, tree canopies act as natural air purifiers, filtering pollutants and improving air quality. Their ability to capture and absorb rainwater helps manage stormwater runoff, reducing flood risks and enhancing water quality. Diverse tree canopies provide resiliency to disease and pests.

Furthermore, tree canopies serve as effective noise barriers, diminishing urban noise pollution from vehicular traffic and other sources. In addition to their environmental benefits, trees enhance the aesthetic appeal of urban landscapes, potentially increasing property values and fostering community wellbeing. Access to green spaces with tree canopies has been associated with improved mental health, reduced stress levels, and increased physical activity among urban residents. Economically, well-maintained tree canopies offer advantages such as reduced cooling costs for buildings and potential boosts to local tourism and businesses. Lastly, by capturing carbon dioxide, urban tree canopies contribute to local efforts to mitigate climate change impacts.

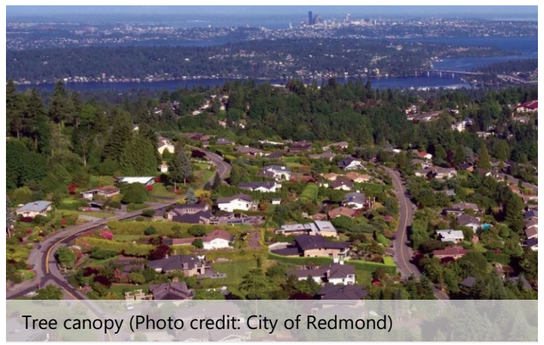
Planting Locations: Areas for planting will be needed to accommodate restoration and mitigation activities needed to offset impacts to trees and critical areas. Additional plantings will be necessary to increase the overall tree canopy cover in Redmond. Areas of interest include lining internal pathways in parks, street trees, and canopy around the perimeter of existing open spaces. In addition to planting in new areas, succession planting should also be considered. Figure 6 shows areas of opportunity to expand tree canopy.

Maintenance Needs:

- Irrigation for first 3 years of establishment
- Collection of leaf/fruit litter from open space/pathways (see M1 for recommendation)
- Monitoring

Potential Challenges:

- Invasive plant species management
- Threats from disease and pests



Tree canopy (Photo credit: City of Redmond)

Tree planting through the Green Redmond Partnership

CONCLUSIONS AND RECOMMENDATIONS

Moving from the planning phase to project implementation phase will require continued citywide discussions concerning implementation planning; monitoring and success metrics; and adaptive management. An immediate next step will be to focus on rewilding and tree canopy expansion.

Implementation Planning

To achieve the goals and vision of a more climate resilient and sustainable vegetation management program, Redmond departments will need to collaborate and strategically implement actions. Implementation planning is a key component of translating the CRSVM Plan to measurable improvements on the ground. Considerations for implementation planning include:

- Accountability and roles. Determining roles and leadership is critical for implementing the CRSVM Plan. This could be achieved through the creation of a cross-department steering committee. The committee could be a continuation of the sustainability team that met to advise this project. A first step for the committee would be to determine a lead/leads for each action of the CRSVM Plan.. The steering committee might also determine if the CRSVM Plan could be best supported by hiring a person focused on urban forestry and citywide vegetation management. Responsibilities associated with this role might include implementation oversight and data tracking to document project achievements. When determining leadership roles, it is important that a person/team also be identified for keeping and updating planting lists and maps in a centralized location.
- Communication and coordination. Since vegetation management actions affect multiple departments, continued coordination in the form of a cross-departmental team could help ensure consistency and collaboration. Additional departments may need to be included as well, such as the Fire Department, the Planning Department, and the GIS team.
- Funding. Successful implementation will require adequate funding and resources. Some actions may be accomplished with existing resources, whereas others will need additional funding. Sources of funding could include Redmond operational budget, longer-term budget asks, and/or fees assessed for tree planting mitigation.
- Equity. Climate change disproportionately impacts underserved communities. Ensuring that investments and projects benefit areas with greater urban heat island, lower canopy cover, and poorer environmental quality helps support the entire city.

Monitoring and Success Metrics

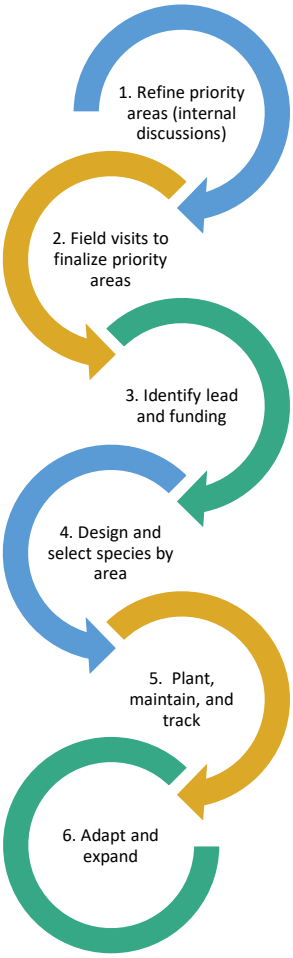
Over time, Redmond will need to review and update the CRSVM Plan. It is important to measure progress in order to redirect or reprioritize efforts as needed. To support reaching overarching goals including 40 percent tree canopy coverage by 2049 (Tree Canopy Strategic Plan/ESAP) and 2,600 acres of accessible habitat and wetlands by 2050 (ESAP), Redmond can track the following metrics:

- Percent change and area of tree canopy increase
- Percent change and area of each rewilding type increase
- Hours, costs, and equipment associated with maintenance practices for vegetation changes

During implementation planning, the Redmond staff team should determine how different metrics will be tracked and updated. The newly developed rewilding and tree canopy GIS map layers can be updated over time, using guidance from Appendix F, to help show positive change and identify new opportunities. Tracking and updating maintenance hours, costs, and equipment can capture shifts in maintenance needs as vegetation diversity and density are increased.

Adaptive Management

In addition to monitoring and tracking metrics, an adaptive management approach will be critical. Adaptive management is a management technique that acknowledges that natural processes and climate change are dynamic and require a flexible approach. A key part of adaptive management is the inclusion of a monitoring period that assesses the effectiveness of an action (or actions) in meeting goals and outcomes. The data from monitoring is evaluated and compared to expected outcomes and results are interpreted to analyze unexpected outcomes. Decision makers can adjust future management actions in response to new information to address CRSVM Plan goals more effectively. Redmond should plan to re-evaluate management practices periodically to incorporate new research, best available science, and lessons learned from both internal experience and feedback from other jurisdictions and institutions.



Rewilding and Tree Canopy Next Steps

The below actions from Table 2 are suggested as a starting point for expanding rewilding, tree canopy expansion and maintenance practices:

- R2: Rewilding Expansion. Convert high maintenance areas with challenging access, and/or under-utilized areas, including turf grass, to rewilding. (Full maps are in Appendix E; documentation of GIS mapping to create maps is in Appendix F).

- T2: Tree Canopy Expansion. Expand tree canopy in areas of low existing tree canopy and where space is available, in alignment with achieving 40 percent tree cover by 2049 as development continues (ESAP 2019). (Full maps are in Appendix E; documentation of GIS mapping to create maps is in Appendix F).

- M1. Leaf Management. Where feasible, retain fallen vegetation debris on site. Place leaf, branch, and tree debris in garden beds, meadows, understory areas, and tree rings of developed parks and natural areas. This reduces effort needed to manage leaves and natural debris, and provides natural mulch, wildlife habitat, and erosion and weed control. On lawns, mulch leaves in place with a mulching mower when leaf fall is not too heavy. These maintenance practices reduce time, effort, and emissions needed to transport leaves and branches for cutting off site, while improving habitat on site.

An iterative framework is recommended to implement these actions. First, additional conversations around priority areas beyond what GIS analysis is capable of may be warranted. Second, field visits can confirm priority areas. The checklist in Appendix G can be used to guide discussions and evaluating an area for different types of rewilding. Third, a project lead and funding source will be needed, depending on the location and type of restoration. Fourth, utilizing staff knowledge, planting areas can be designed, and species can be selected using the recommended species lists (Appendix C and D). Fifth, areas can be planted and then will require continued maintenance and tracking. Finally, learning from successes and challenges at each site will inform adapting management practices and expanding rewilding and tree planting to additional areas of Redmond.

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GLOSSARY

Carbon sequestration: The capture, removal, and storage of carbon dioxide from the atmosphere. Biological carbon sequestration includes storage in vegetation such as forests and grasses.

Climate change: The long-term change in average temperatures and weather patterns.

Climate resilience: The capacity of the natural environment to prevent, withstand, respond to, and recover from a disruption (U.S. Climate Resilience Toolkit 2021).

Climate vulnerability: The extent to which people or ecosystems are at risk from climate change impacts.

Ecosystem services: Direct and indirect benefits that ecosystems provide to humans such as air quality, carbon sequestration, and habitat.

Electrification: The conversion of a machine or system to the use of electrical power.

Environmental health: The branch of public health that is concerned with monitoring or mitigating environmental factors that affect human health.

Environmental sustainability: Fostering practices that reduce pollution, waste, and damages to the natural environment with the objective of having a healthy environment with resources to exist for future generations (Redmond Environmental Sustainability Plan 2020).

Extreme climate event: Unusually severe weather or climate conditions for a given area that can disrupt ecosystems and affect human health.

Geographic Information Services (GIS): A computer system that stores, analyzes, and displays data, especially spatial data.

Greenhouse gas emissions: The release of greenhouse gases such as carbon dioxide, methane, and nitrous oxide.

Green infrastructure: Engineered systems that use or replicate natural systems to perform ecosystem services, such as stormwater management, air quality improvement, and climate change mitigation.

Integrated Pest Management (IPM): An ecosystem-based strategy that seeks to prevent pest damage through a combination of environmentally sensitive practices such as choosing pest-resistant plants and environmental control.

Naturalized meadows: An open habitat or field with a diversity of early successional native plants that has the appearance and function of a wild meadow.

Rewilding: The restoration of an area of land to increase biodiversity and restore its natural processes.

Right of Way (ROW): Streets and other public property that are reserved for public use.

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APPENDIX A

Literature Review Documents

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Science + Planning + Design

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Table A-1. City of Redmond Documents Reviewed.			
Name	**Department or Division**	**Type**	**Citations**
20-Year Forest Management Plan	Parks & Recreation	Plan	Green Redmond Partnership 2009
Best Management Practices and Maintenance Procedures	Parks & Recreation	Guidance	City of Redmond n.d.a
City of Redmond Operations Zero Carbon Strategy	Citywide	Plan	City of Redmond 2021a
City of Redmond Utilities Strategic Plan	Public Works	Plan	City of Redmond 2021c
Citywide Watershed Management Plan	Public Works	Plan	Herrera 2013
Community Strategic Plan	Citywide	Plan	City of Redmond 2021b
Environmental Sustainability Action Plan (ESAP)	Citywide	Plan	City of Redmond 2020b
Environmental Sustainability Data Dashboard (ESAP Dashboard)	Citywide	Guidance	City of Redmond 2023c
Future Vision for Redmond: Utilities	Public Works	Plan	City of Redmond 2011
Green Redmond Partnership	Parks & Recreation	Program	City of Redmond 2024
Integrated Pest Management (IPM) Practices	Parks & Recreation	Guidance	City of Redmond 2020d
Joint Letter of Commitment: Climate Change Actions in King County	King County	Policy	King County 2019
Parks, Art, Recreation, Culture & Conservation Plan (PARCC Plan)	Parks & Recreation	Plan	City of Redmond 2023b
Redmond 2050 Supplemental Draft EIS	Planning; Public Works	Plan	City of Redmond 2023c
Redmond Climate Emergency Declaration	Citywide	Policy	City of Redmond 2020a
Redmond Climate Vulnerability Index	Citywide	Assessment	City of Redmond 2022
Redmond Climate Vulnerability Risk Assessment and Strategy	Citywide	Assessment	City of Redmond 2022
Redmond Municipal Codes General Landscape Standards	Citywide	Policy	RZC 21.32.050
Redmond's Tree Canopy Strategic Plan	Citywide	Plan	City of Redmond 2019
Shoreline Master Program (SMP)	Citywide	Program	RZC 21.68
Sustainable City Operations	Citywide	Website	City of Redmond 2023d
Zoning Code Landscaping Guide	Planning	Policy	City of Redmond 2012

Table A-2. Previous and Ongoing Vegetation Management Activities.			
Type	**Activity**	**Division**	**Source**
Data Collection and Tracking	Acquiring an updated LiDAR dataset to measure tree canopy cover every 2 years.	Public Works	PARCC Plan
	Inventorying street trees on a 5-year cycle and managing nearly 8,000 street trees.	Parks and Recreation	PARCC Plan
	Recording the location of noxious weeds and treatment methods on paper maps and spreadsheets, managed by the Washington Conservation Corps, but transitioning the data to GIS.	Public Works	SWOT Workshop
	Inventorying vegetation on Redmond properties and tracking with GIS.	Public Works Parks and Recreation	SWOT Workshop
	Monitoring of vegetation at Redmond mitigation and restoration sites.	Public Works	SWOT Workshop
	Maintaining a public dashboard to communicate tree canopy performance information.	Parks and Recreation	PARCC Plan; ESAP Dashboard
	Maintaining a Tree Risk Assessment Area GIS layer with an inventory of all trees on city-owned properties.	Parks and Recreation	SWOT Workshop
Design	Including green infrastructure in park design and including natural landscaping.	Parks and Recreation	PARCC Plan
	Planting native and adaptable plant species.	Parks and Recreation	PARCC Plan
Education and Outreach	Encouraging participation in Green Redmond Partnership and/or becoming a Forest Steward and developing a Green Redmond Partnership 20-year guide for outreach and communication.	Parks and Recreation	20-Year Forest Management Plan
	Planted, to date, over 13,195 trees and 24,800 shrubs and small plants across 20 parks since 2009 through October 31, 2023. Over 12,730 volunteers have contributed cumulatively over 34,580 hours of service through Green Redmond Partnership events and planting days.	Green Redmond Partnership/ Parks and Recreation	ESAP/Green Redmond
	Providing educational resources on landscaping; use the *Plants of the Pacific Northwest: Washington, Oregon, British Columbia and Alaska and American Nurseryman Standards* guides to provide detail on native species and best conditions of plants prior to planting. Also use the *King County Native Species Guide*.	Citywide	Zoning Code Landscaping Guide
	Maintain a recommended street tree list.	Parks and Recreation Planning Department	Zoning Code Landscaping Guide
Maintenance	Managing Resource Parks: lightly developed natural areas that are not developed for active recreation uses.	Parks and Recreation	PARCC Plan
	Using an adaptive management model for the urban forest effort.	Parks and Recreation	20-Year Forest Management Plan
	Using proactive, preventive pest control measures, such as using high-quality soil and planting pest-resistant plants, as well as using environmentally safe weed control.	Parks and Recreation Public Works	Parks and Recreation IPM Practices

Table A-2 (continued). Previous and Ongoing Vegetation Management Activities.			
Type	**Activity**	**Division**	**Source**
Maintenance (continued)	Using site-specific mowers (e.g., boom arm, scope).	Parks and Recreation Public Works	SWOT Workshop
	Using centralized water control system (Maxicom) to monitor and control landscape irrigation.	Parks and Recreation	ESAP
	Maintaining best management practices and maintenance procedures for vegetation.	Parks and Recreation	Best Management Practices and Maintenance Procedures
	Perform regular vegetation maintenance including assessing, mowing, weed and invasive removal, planting, mulching, pruning, fertilizing, renovating, brush control, watering, tree removal, inventorying.	Parks and Recreation Public Works	Best Management Practices and Maintenance Procedures
	Protecting and restoring watersheds, including removing invasive plants and replanting buffers with shade producing trees.	Public Works	Citywide Watershed Management Plan
Programs and Capital Improvement Projects	Replaced annual planting beds with drought-tolerant perennials, transitioned to as-needed irrigation, and utilizing drought-resistant landscaping on City Hall Campus.	Unknown	ESAP
	Provided Neighborhood Matching Grants to increase canopy in neighborhoods where needed.	Unknown	Tree Canopy Strategic Plan
	Installed artificial turf at 80 percent of city-owned fields to conserve water resources.	Parks and Recreation	ESAP
	Monitoring and preserving shoreline habitat along Lake Sammamish with the goal of preventing erosion and habitat destruction.	Public Works	NE 40th Project
	Restored Mackey and Clise Creeks to prevent flooding and enhance stream and buffer habitat, including invasive species removal.	Public Works	ESAP
	Restored the lower portion of Bear Creek to improve salmon habitat and passage.	Public Works	Sustainable City Operations website
	Had 36 percent more acres enrolled in active management for restoration between 2013 and 2018.	Citywide	ESAP
	Running volunteer programs that remove nonnative and invasive plants, and plant native trees and shrubs.	Green Redmond Partnership/Parks and Recreation	ESAP
	Using the Ecological Score card to promote diverse landscape areas using best practices. Applicants must achieve at least 20 points by applying specific techniques.	Planning	Zoning Code Landscaping Guide
	Offering irrigation retrofits and rebates, classes and consultants for professional landscapers, and incentive-based water pricing to promote water conservation through Cascade Water Alliance.	Cascade Water Alliance	ESAP

Table A-2 (continued). Previous and Ongoing Vegetation Management Activities.			
Type	**Activity**	**Division**	**Source**
Policy	Prohibiting the removal of native plants or use of herbicides under the aquatic vegetation guidelines.	Planning	Shoreline Master Program
	Setting standards and specifications for tree protection and replacement and the fee in lieu program and tree credits.	Planning	Code
	Applying conservation and public access easements to undeveloped parklands.	Parks and Recreation	PARCC Plan
	Developing a portfolio of carbon offsets and capture initiatives, including to meet the Redmond's commitment to carbon neutrality.	Citywide	City of Redmond Operations Zero Carbon Strategy
Reporting	Continuing certification as a Tree City USA, with 22 parks sites certified as wildlife-friendly spaces.	Parks and Recreation	ESAP

Table A-3. Future Vegetation Management Activities.			
Type	**Activity**	**Division**	**Source**
Design	Update the Stormwater Technical Notebook and green vegetation list based on feedback from citywide divisions.	Unknown	Redmond Climate Vulnerability Risk Assessment and Strategy
Education and Outreach	Provide more opportunities for community groups to assist in planting and restoration, using events such as Arbor Day or other volunteer service days.	Citywide	Redmond's Tree Canopy Strategic Plan
Maintenance	Enhance accessible native habitats, wetlands, and open spaces.	Citywide	Redmond Climate Vulnerability Risk Assessment and Strategy
	Implement a Redmond operations integrated pest management program.	Citywide	Sustainable City Operations webpage
	Facilitate healthy riparian habitat, including noxious weed control and dry season irrigation.	Citywide	Redmond Climate Vulnerability Risk Assessment and Strategy
	Select drought tolerant plants for tree planting on public and private lands.	Citywide	Redmond Climate Vulnerability Risk Assessment and Strategy
	Encourage phased replacement of vegetation improperly located in ROW.	Public Works Parks and Recreation	Future Vision for Redmond: Utilities
Programs and Capital Improvement Projects	Protect and restore degraded streams and wildlife habitat with projects such as salmon recovery and conservation, culvert replacements, and watershed rehabilitation.	Citywide	Community Strategic Plan
	Identify permanent city funding to support forest health improvements to reduce wildfire risk and expand public awareness campaigns on wildfires.	Citywide	ESAP
	Assess parks for areas where mown grass can be rewilded and converted to meadow or tall grass.	Parks and Recreation	PARCC Plan
	Continue mitigation and construction of Mackey Creek within Farrel-McWhirter Park.	Public Works	Mackey Creek Report
	Evaluate the acquisition of forest parcels to preserve urban forest cover and consider acquiring non-forest parcels as a "tree bank" that can be planted with future canopy, which can be used when offsite mitigation planting is necessary.	Citywide	Redmond's Tree Canopy Strategic Plan
	Enhance vegetated buffers to slow surface water flows, facilitate filtration, and encourage infiltration of clean water through planting of native plants.	Citywide	Redmond Climate Vulnerability Risk Assessment and Strategy

Table A-3 (continued). Future Vegetation Management Activities.			
Type	**Activity**	**Division**	**Source**
Policy	Provide incentives or requirements for buffer restoration, aiming to increase plant density and diversity.	Citywide	Redmond Climate Vulnerability Risk Assessment and Strategy
	Protect accessible native habitats, wetlands, and open spaces.	Citywide	Redmond Climate Vulnerability Risk Assessment and Strategy
Policy	Incentivize residential drought-tolerant and lawn-removal landscaping.	Citywide	ESAP
	Build and restore a sustainable urban forest.	Citywide	20-Year Forest Management Plan
	Emphasize restoring and retaining trees located in neighborhoods with the most development activity, including Downtown, Overlake Village, Southeast Redmond, Bear Creek, North Redmond, and Sammamish Valley.	Citywide	Redmond's Tree Canopy Strategic Plan
	Collaborate with King County on the development and implementation of goals and strategies that improve urban tree canopy, forest health, and carbon sequestration, informed by the King County Land Conservation Initiative and the countywide 30-year forest plan.	King County	Joint Letter of Commitment: Climate Change Actions in King County
	Place utilities underground to prevent need to prune trees and shrubs in utility corridors and locate utility corridors in existing cleared areas. Pipeline corridors can be maintained with grass/low-growing vegetation that allows easy inspection while preventing erosion.	Parks and Recreation Public Works	Future Vision for Redmond: Utilities
	Encourage "green" roofs.	Public Works	Future Vision for Redmond: Utilities
Reporting	Update the Green Redmond 20-Year Forest Management Plan based on feedback from citywide divisions.	Citywide	Redmond's Tree Canopy Strategic Plan
	Collaborate with King County on the development and implementation of goals and strategies that improve urban tree canopy, forest health, and carbon sequestration, informed by the King County Land Conservation Initiative and the countywide 30-year forest plan.	King County	Joint Letter of Commitment: Climate Change Actions in King County
	Place utilities underground to prevent need to prune trees and shrubs in utility corridors and locate utility corridors in existing cleared areas. Pipeline corridors can be maintained with grass/low-growing vegetation that allows easy inspection while preventing erosion.	Parks and Recreation Public Works	Future Vision for Redmond: Utilities

APPENDIX B

Gaps and Opportunities

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GAPS AND OPPORTUNITIES

While this CRSVM Plan focuses specifically on education and outreach, maintenance practices, rewilding, and tree canopy, additional gaps and opportunities were identified through the literature review, SWOT workshop, and conversations with Redmond staff.

City Staff and City Alignment

Gap: Vegetation management is currently shared by multiple divisions resulting in inefficient communication, data management and coordination.

Opportunity: Increasing internal coordination and resources around vegetation management could help increase continuity, efficient internal communication and data management, and alignment, as vegetation management is currently shared by multiple divisions. This could look like:

- Consider a Redmond Arborist position. The Redmond arborist could act as a central point to help connect across divisions and be focused on implementing the 20-Year Forest Plan and Tree Canopy Strategic Plan.
- Consider an Urban Forestry Division. Centralizing maintenance responsibilities could help reduce interdepartmental duplicity.
- Consider a citywide Urban Forestry workgroup. Currently, the Parks Department has an Urban Forestry workgroup that includes one lead maintenance technician, two support maintenance technicians, and one to two supplemental staff during the spring and summer. This workgroup maintains Parks Department street trees, paved and soft surface trails, and Green Redmond Partnership sites. Creating a regularly scheduled meeting workgroup that spans city departments and manages trees and vegetation could help identify synergies to work towards the same goal and increase continuity and fill in knowledge gaps when Redmond staff leave. This could be a cross-department steering committee. The workgroup should coordinate with staff identified for keeping and updating planting lists and maps in a centralized location when new species are identified for planting or issues arise with a particular species.

Community Programs (e.g., Green Redmond Partnership, Washington Conservation Corps)

Gap: Redmond is currently unable to meet tree canopy expansion goals solely on public property with Redmond staff.

Opportunity: Current engagement of residents and businesses through city programs and the Green Redmond Partnership can be leveraged to expand programs such as volunteer stewardship programs and expanding planting in residential and private properties. Some potential directions for expansion could include:

- **Residential tree planting and maintenance programs.** (See Tree Canopy section of this appendix.)
  - An example of a residential tree maintenance program is the City of New York's Citizen Pruners program that trains volunteers in tree care, biology, identification and pruning. Volunteers live and work throughout the city.
- **Tree education program.** The City of Bellevue runs a Neighborhood Tree Ambassador program that trains volunteers to lead guided tree tours of their neighborhoods and has offered to collaborate with Redmond, including sharing resources and branding, and exploring group purchase opportunities.
- **Create a Food Forest.** Food forests combine agroforestry and permaculture to make diverse and resilient landscapes that are edible. The City of Seattle's P-Patch program includes volunteer-run community gardens or "Food Forests" on previously unused land that mimic a natural forest ecosystem and produce edible plants that are open to the public.
- **Expand community gardens.** Community gardens could support removal of turf-grass and increase pollinator habitat while also promoting enhanced use for the community.

Native and Climate Resilient Plants

Gap: There is a lack of user-friendly guidance for species selection in Redmond.

Opportunity: Utilizing drought-tolerant and disease resistant plants that are adapted for current and future climate zones will be critical for future vegetation management in Redmond. This could include a combination of native and nonnative, non-invasive plants. Prioritizing these plants could also reduce future tree removal, irrigation, herbicide use, and maintenance time for Redmond staff. While Redmond maintains numerous resources for plant selection, there is a lack of distilled, user-friendly guidance for residents and developers to understand where, what, and how to plant native and climate resilient plants. This CRSVM Plan created recommended species planting lists for city-maintained plantings. Resources for residents and developers could be built out from the CRSVM Plan to support their use of native and climate resilient plants as well.

- **Create a series of graphic and user-friendly plant and tree lists.** Easy-to-understand lists could include a street tree list, natural areas tree and plant guide, homeowner's tree and understory plant guide, and native plants planting guide (and native cultivars for homeowners).
- **Create more user-friendly documents for sourcing, planting, and maintenance.** Additional guidance on planting techniques, invasive species removal, and water saving tips could support more climate resilient planting. Vegetation management guidance could also help broaden a stewardship and volunteer network of people, which was outlined as a main strategy in the Tree Canopy Strategic Plan. Developing a list of local nurseries that sell native plants could also be beneficial.

- **Create a program that targets HOAs.** Consider focusing on supporting or incentivizing planting native and climate resilient plants in native growth protection easements.

Rewilding

Gap: There is interest for rewilding practices, but no available areas or approaches identified to implement.

Opportunity: "Rewilding" is an ecological strategy that helps rebuild wildlife populations by restoring wildlife habitats and goes beyond planting native plant species in park landscapes. As described in the PARCC Plan, rewilding urges a new kind of urban ethic, to conserve and protect nature while reducing the urban ecological footprint. Transitioning current low use, resource-intensive, and maintenance-intensive grass areas to natural areas with pollinator-friendly plants would benefit the environment. Furthermore, there is strong community support for "rewilding" initiatives. These initiatives could also help reduce maintenance, conserve water, reduce herbicide use, improve pollinator habitat, and sequester carbon.

- **Identify potential locations for rewilding in public parks and natural areas.** As mentioned in the PARCC Plan, parks and natural areas can accommodate rewilding areas within their footprints by converting traditional landscapes of mown lawn and trees into more natural plant communities without losing outdoor recreational values and function. Also consider areas underneath trees that can be hard to plant and mow. A GIS-based approach could be used to identify locations for pollinator gardens and rewilding, like the process identified for tree canopy mapping.
    - The City of Seattle's Parks and Recreation Department is part of the Bee City USA efforts. With this, they have developed meadows, pollinator gardens, and meadows on the margins in parks. These transitioned landscapes result in reduced resources and maintenance activities. In meadows, fallen logs are repurposed to decompose and provide soil nutrients.
    - The City of Edmonds also utilizes meadow grass borders, emphasizing drought tolerant grasses.
    - The City of Vancouver, British Columbia has developed pollinator meadows across the city's parks. These areas are intentionally naturally managed in parks, golf courses, and boulevards.
    - The City of Boise's Katherine Albertson Park was improved to convert turf to meadow with interpretive signage. Meadows are seeded with native flowers and there are pollinator gardens in public areas. Meadows border lawns and tree-covered spaces.
- **Identify potential locations for rewilding in public landscaped areas, utility corridors, and ROWs.** City maintenance resources have a difficult time keeping up with current and future demands. Maintaining a "managed" level of service for vegetation management in public landscaped areas, utility corridors, and ROWs is a challenge. Existing utility corridors and ROW areas could be replanted to lower maintenance plants (e.g., drought tolerant). Like the process identified for tree canopy mapping, a GIS-based approach could be used to identify locations for pollinator gardens and rewilding. A final prioritized list could be ready for when roadways are renovated and there may be opportunities to update the ROW as well.

- The City of Spokane changed their traditional grass landscape to a "meadow" at the Liberty Park Library. The sustainable landscape features pollinator-friendly, lower maintenance plants that can also be used as an educational tool.
- The City of San Francisco plants "habitat hedgerows" of local native shrubs and perennials to encourage pollinating insects.
- The Xerces Society provides recommendations for sourcing and planting pollinator gardens in ROWs and marginal lands. Focus on areas like parking strips or roadsides where trees may be dangerous, or problematic but herbaceous plants will not. Try to order seeds in individual lots and not as a mix, to ensure that all species are accounted for and there is an even distribution.

- Partner with Cascade Water Alliance to provide lawn removal incentives. Support residents in promoting water conservation and increasing diversity through removing areas of turf lawn and replacing with diverse, drought-tolerant species. Incentives could include rebates and/or technical support and guidance.

Tree Canopy

Gap: There is a need to meet the goal of increasing citywide tree canopy cover to 40 percent by 2049 while also experiencing increased development, utility conflicts, and climate change.

Opportunity: Meeting this goal will require a multi-layered approach and could include expanding planting to private property, acquiring additional public land for planting, tightening code to better protect existing trees, and conducting a targeted analysis of areas on public lands for expansion. In addition to expanding tree canopy on city-owned land described in the plan, the below actions could be considered.

- Incentivize residential tree planting. The Tree Canopy Strategic Plan identifies that nearly half of available lands for canopy expansion are single-family residential sites. Increasing tree planting on private land is needed as well as public lands. Funding from the Sound Transit and Lake Hills projects could potentially be used for this strategy. Prioritize areas with greater urban heat island and lower adaptive capacity, as identified in the Tree Canopy Strategic Plan. A residential tree planting program could take one of the following approaches:
  - Focus on residential properties. Create a reduced-price tree program for property owners. This program could range from a free or reduced-price tree or a "tree-bate" coupon that property owners could use at local nurseries to select from a mix of trees that are suitable for our climate and the site to be planted. Trees will include educational materials on tree selection for the site, planting, and maintenance as identified in the Tree Canopy Strategic Plan.
  - Focus on residential properties and unimproved ROW areas between the sidewalk and the road.
    - The City of Seattle's Trees for Neighborhoods Program is a city-run program that offers free trees to residents/landlords who apply through a lottery. Program participants receive training on tree planting, care, maintenance, and applying for permits, as well as street tree health evaluations for the first couple years.

    - The City of Bellevue's Tree Giveaway Program gives residents, renters, and community organizations and schools free trees, training on proper planting and care, reminders about tree care, supplies, and a yard sign.

- **Expand Redmond street tree planting in partnership with a community organization.** The current program covers principal, minor, and collector arterials and could extend to more residential streets. Consider equitable distribution and emphasis on areas experiencing more intense urban heat island. Some examples of partnership models include:
    - The City of San Francisco's Friends of the Urban Forest Program is a non-profit organization that partners with Public Works to increase city tree canopy. The program plants trees and prunes them for 3 years through volunteer efforts. Public Works waters the tree. After the first 3 years, the city cares for the tree. This includes pruning every 3–5 years through San Francisco's StreetTreeSF program, which is a voter-approved initiative.
    - New York City's Street Tree Planting Program is run by New York City's Parks and Recreation Department. Through the program, residents can request a tree. A Parks Forester reviews applications and surveys sites, then plants and maintains trees through the program.
- **Partner with the community to evaluate a memorial and/or heritage tree program.** This could increase canopy within parks and open spaces and is used by nearby jurisdictions.
    - The City of Vancouver, WA has a Witness Tree program part of their Public Works urban forestry program. Residents can plant a tree in honor or memory of a special person or event. The program doubles as an adopt-a-tree program.
    - The City of Issaquah has a Heritage Tree program that promotes identification and recognition of trees with unique characteristics such as size or age not normal for a species, historical significance, or ecological value.
- **Create and share a "right tree, right place guide."** Species can be selected that will support biodiversity and future climate conditions, while also reducing risk for drought and disease. This could support increased conifer planting to help recreate a typical Pacific Northwest forest structure. A variety of trees should be selected to fit a variety of urban contexts.
- **Explore existing paved areas that could be used as tree planters.** Consider a GIS-based analysis to identify opportunities to reduce paving and increase tree canopy cover. This could be paired with establishing and enforcing a sustainable standard for tree and vegetation planter areas.
- **Strengthen regulation to protect existing trees and ensure that dead trees are replanted.** Protecting mature trees and preventing their removal reduces the need for replanting efforts and encourages carbon sequestration.
- **Look to non-potable reuse for irrigation.** As parks are redeveloped or developed, consider opportunities to capture stormwater for reuse for landscape irrigation. Even with selection of drought-tolerant and climate resilient plants, many plants still require watering for their first years of establishment. Alternative water sources could help supply this.

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APPENDIX C

Climate Resilient Tree Species Lists

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Climate Resilient Tree Species Lists

Herrera developed two recommended tree species planting lists for Redmond to use and update over time. Tree lists are split into Urban Landscape & Street Trees and Natural Area Trees. Each list provides additional information that can be used to select the right tree for the right place. Table C-1 includes definitions for terms used in the lists. Some terms are specific to urban landscape and street trees whereas others are for natural area trees.

Table C-1. Definitions for Tree Species Lists.

Term	Definition
Cultivar	A cultivated variety of a plant species that has been selected and developed for specific characteristics through cultivation. Cultivars can have distinct features such as color, size, flavor, or resistance to diseases, and they are often maintained through selective breeding.
Disease and pest resistance	Disease and pest resistance in plants refers to the ability of a plant to withstand or repel attacks by pathogens (disease-causing organisms) and pests (harmful insects or animals). Resistant plants can limit the damage caused by diseases and pests without the need for extensive chemical treatments.
Forest	A forest is a large area covered chiefly with trees and undergrowth. Forests play a crucial role in maintaining biodiversity, regulating climate, and providing habitat for numerous species.
Oak savanna	Oak savanna is a type of ecosystem that features a combination of open grassland and scattered oak trees. It is characterized by a mix of grasses and forbs with widely spaced oak trees, allowing for a diverse habitat.
Oak woodland	Oak woodland is a type of ecosystem dominated by oak trees with a denser tree cover compared to oak savanna. It falls between a dense forest and an open savanna in terms of tree density.
Open Woodland	Open woodland generally refers to a type of woodland where the tree canopy is not fully closed, allowing for sunlight to reach the ground. This creates a more open and less dense forest environment.
Riparian	Riparian refers to the areas along the banks of rivers, streams, or other water bodies. Riparian zones are characterized by unique vegetation and play a critical role in supporting aquatic ecosystems.
Spacing O.C.	Spacing on center (O.C.) refers to the measured distance between the centers of individual plants in a planting arrangement. It is commonly used in horticulture and forestry to ensure proper spacing for optimal growth and resource utilization.
Sustainability / Ease of Maintenance	• Low - Extra care and consideration should be utilized in tree's placement and maintenance. Landscape planting will generally be less maintenance than ROW. • Moderate - May require supplemental watering in hot weather, pruning every 3-5 years, may be susceptible to disease. • High - Easy to maintain, does not require extensive watering once established, pruning or pest management.
Variety	A horticultural variety (var.) refers to a subgroup within a plant species that is cultivated for specific desirable characteristics. These characteristics can include features like size, color, flavor, yield, resistance to diseases or pests, adaptability to certain climates, and other traits that make the plant suitable for cultivation in horticultural settings. Horticultural varieties are often the result of selective breeding or genetic modification to enhance specific qualities and meet the preferences or needs of growers, consumers, or environmental conditions.
Wetland Indicator Status	Wetland indicator status is a classification used to identify plant species based on their association with wetland environments. Plants are categorized as "obligate wetland (OBL)," "facultative wetland (FACW)," "facultative (FAC)," "facultative upland (FACU)," or "obligate upland (UPL)" based on their preference for wetland or upland conditions. Information in Table C-3 is based on 2022 National Wetland Plant List (NWPL) for Western Mountain, Valleys, and Coast Region. This information should be updated when the NWPL is updated.

The Urban Landscape & Street Trees list (Table C-2) indicates whether a species is appropriate for a street tree, and includes information about tree climate resiliency, disease and pest problems, mature size, planting strip width, exposure, soil moisture needs, and whether it can be planted under wires. Additional information about tree characteristics, ease of maintenance, recommended cultivars, and planting notes can help further refine availability and where the tree would be best planted.

The Natural Area Trees list (Table C-3) focuses on entirely native trees. The list indicates whether a species is a wetland species and includes information about mature height, climate resilience, disease and pest problems, recommended spacing (assuming no understory rewilding), planting habitat, and exposure. Additionally, the list includes information about tree characteristics, pollinator benefits, soil moisture needs, and planting notes.

Lists were developed in conjunction with Redmond staff through a workshop focused on tree canopy expansion and through staff review. Lists should be regularly updated to reflect which species are doing well and/or are expected to do well as the climate continues to change.

Urban Landscape and Street Trees List

City of Redmond Climate Resiliency and Sustainability Vegetation Management Plan

SPECIES		CHARACTERISTICS												PLANTING AND MAINTENANCE						
BOTANICAL NAME	COMMON NAME	RECOMMENDED CULTIVARS	FAMILY	NATIVE / NON-NATIVE	MATURE HEIGHT	MATURE WIDTH	SOIL/ MOISTURE	EXPOSURE	EVERGREEN/ DECIDUOUS	FORM/ SHAPE	POLLINATORS/ WILDLIFE	AUTUMN COLOR	UNIQUE CHARACTERISTICS	SUSTAINABILITY/ EASE OF MAINTENANCE	CLIMATE RESILIENCE	DISEASE AND PEST PROBLEMS	PLANTING UNDER WIRES?	STREET TREE?	PLANTING STRIP WIDTH (FEET)	NOTES
VERY LARGE TREES																				
Abies grandis	Grand fir	N/A	Pinaceae	N	70'-100'+	20'-35'	Rich, well-drained, acidic, consistently moist, adaptable once established.	Full sun - light shade	E	Conical, dense when young	Bees, birds and small mammals	N/A	Does well in lower elevation, fragrant needles, needs ample room to grow.	Moderate	Most resilient native true fir.	Balsam wooly adelgid	N	N	8.5'+	Large size make this better suited for landscape areas than street trees. Can work in large planting strip.
Castanea sativa	Spanish chestnut	N/A	Fagaceae	NN	70'-100'	30'-50'	Dry to moist soil, tolerates drought and maritime exposure. Tolerates a range of soils.	Full sun - light shade	D	Dense, oval	Birds, pollinators, small mammals	Brown-Yellow	Sharply dentate, shiny leaves, edible chestnut fruit in spike seed pods. Dense crown. White flowers in spring.	Low	Drought tolerant.	Leaf spot, powdery mildew	N	N	6'+	Better for larger landscape areas where chestnuts can fall without causing issues to the public.
Juglans nigra	Black walnut	N/A	Juglandaceae	NN	50'-75'	50'-75'	Deep, fertile, and moist soil. Tolerates wet soil, but not drought.	Full sun - light shade	D	Densely branched, oval	Birds, pollinators, small mammals	Yellow	Large compound leaves, dramatic branching and crown. Allelopathic, may suppress the growth of other plants nearby. Edible walnuts.	Moderate	Moderate drought tolerance, requires little maintenance.	Susceptible to anthracnose and tent caterpillars.	N	N	8.5'+	Better suited to large landscape areas than within a ROW. May create dense shade and difficult planting areas underneath.
Pinus ponderosa var. benthamiana	Willamette Valley ponderosa pine	N/A	Pinaceae	N	70'-150'	25'-35'	Well-drained, deep, somewhat moist soil. Adaptable to a variety of soil and humidity and can tolerate dry conditions and poor soils.	Sun	E	Narrow form, pyramidal	Birds, small mammals	N/A	Long needles, thick furrowed bark, tall form.	Moderate	Drought tolerant.	Western pine beetle, sawfly, tip blight, needle blight, canker, engraver beetle, pine wilt	Y	Y	6'+	Good tree for large ROW planting spaces, still allows for line of site with traffic
Pseudotsuga menziesii	Douglas fir	N/A	Pinaceae	N	90'-200'	40'-45'	Prefers moist, well-drained soil. It can tolerate seasonally dry conditions. Grows in a variety of soils.	Sun - part shade	E	Upright	Butterflies, moths, small mammals, large mammals	N/A	Densely branched evergreen, distinct cones, furrowed bark. Very tall tree.	Moderate	Urban tolerant, pollution tolerant, drought tolerant and tolerant of wet feet.	Pine pitch canker, root rot, armillaria, Douglas fir beetle, needlecast.	N	Y	8.5'+	Young trees branched to the ground. Review sight triangle.
Sequoia sempervirens	Coast redwood	N/A	Cupressaceae	NN	60'-200'+	45'-50'	Acidic, well-drained, moist soil. Adaptable to other soil conditions once established.	Sun - part shade	E	Upright, narrow form	Birds, small mammals	N/A	Fern-like evergreen foliage. Red, fibrous bark. Can get very tall and wide.	Low - Moderate	Not drought tolerant.	Pest and disease resistant	N	N	8.5'+	
Sequoiadendron giganteum	Giant sequoia	N/A	Sequoioideae	NN	100'-250'	40'-60'	Does best in deep, well-drained sandy loams. Doesn't tolerate wet feet. Requires	Sun - part shade	E	Upright, pyramidal when young	Birds, bats, small mammals	N/A	Gets very tall and wide. Evergreen, threadlike scales, thick furrowed bark.	Moderate	Drought tolerant once established.	Sequoia bark beetle, canker, blight	N	N	8.5'+	

							water to establish.												
LARGE TREES																			
Acer macrophyllum	Bigleaf maple	N/A	Sapindaceae	N	50'-100'	40'-75'	Tolerates a variety of soils, does best in mildly acidic to neutral soils. Can tolerate wet conditions.	Sun - part shade	D	Large, oval form	Bees, butterflies, birds, small mammals	Yellow	Large leaves, often multi-leaders, shallow root system.	Moderate	Resilient to climate change in forests, somewhat resilient in urban areas.	Beetle Borers, California Flathead Borer and Caterpillars, Sudden Oak Death, Root Rot, Oak Root Rot, Annosus Root Disease, White Mottled Rot, Leaf Spot and Verticillium.	N	Y	8'+	Does well in larger planting areas. Opportunity to add natives species to urban areas. Provides animal habitat.
Betula nigra	River birch	Heritage, Dura-Heat, City Slicker	Betulaceae	NN	60'-80'	30'-40'	Adapted to wet soils, does best in moist, acidic soils.	Sun - part shade	D	Pyramidal to oval, may be multistem	Birds, small mammals	Yellow	Attractive, peeling bark.	High	Tolerates heat and cold, intolerant of drought and high pH.	Most resistant birch to bronze birch borer	N	Y	4'+	Dura-Heat and Heritage can be in smaller planting strip (4 Ft) than other cultivars.
Calocedrus decurrens	Incense cedar	'Aureavariegata', 'Maupin Glow'	Cupressaceae	NN	40'-60'	10'-15'	Needs well-drained soils, adaptable to a variety of soils.	Full sun - light shade	D	Upright, narrowly pyramidal	Birds, small mammals	N/A	One of the most narrow/columnar conifers, good as a hedge, needles don't brown in the winter.	High	Very tolerant of poor soils and drought.	Very few diseases or pests	N	N	6'+	Native to southern Oregon and northern California. Better suited for landscape areas than street trees. Can work in large planting strip.
Catalpa speciosa	Northern catalpa	N/A	Bignoniaceae	NN	50'-70'	20'-50'	Medium to wet well-drained soils. Can tolerate clay soils and both wet and dry soils.	Sun - part shade	D	Loose and open	Bees, moths, birds	Yellow	Fast-growing, large leaves, orchid-like fragrant flowers, long seed pods. Smaller leaves than *C. speciosa*.	Moderate-High	Tolerates air pollutions, drought and a variety of soils.	No serious insect or disease problems. Susceptible to verticillium wilt, leaf spots, mildew and twig blight.	N	Y	6'+	Medicinal uses and very showy flowers and leaves. Flowers and seed pods can be messy but are very resilient as street trees.
Celtis occidentalis	Hackberry	'Chicagoland', 'Delta', 'Magnifica', 'Prairie Pride'	Fagaceae	NN	40'-50'	35'-45'	Tolerates a variety of soils.	Sun	D	Upright-spreading / vase shaped	Bees, butterflies, birds, small mammals	Yellow	Coarse texture.	High	Very adaptable. Tolerant of cold, heat, high pH, flooding.	Nipple gall, witches broom	N	Y	6'+	Good tree for tough urban conditions.
Chamaecyparis lawsoniana	Port Orford cedar	N/A	Cupressaceae	NN	40'-60'	10'-15'	Moist, well-drained sandy loam. Overwatering causes root rot.	Indirect sun - part shade	E	Pyramidal	Birds, small mammals	N/A	Evergreen with dense foliage.	Moderate	Tolerant of drought conditions.	Phytophthora root rot	N	Y	6'+	Protect from strong wind. Good as a screen or hedge.
Fagus sylvatica	European beech	'Asplenifolia', 'Atropurpurea', 'Riversii'	Fagaceae	NN	50'-60'	40'-60'	Deep, rich, moist but well-drained soils. Intolerant of wet, poorly drained soil.	Sun	D	Oval, dense, low branches	Birds, small mammals	Red	Silvery, smooth bark. Low-branches. Very grand-looking tree. Cultivars have variation in leaf color and shape. Low branching may not be suitable for sidewalk adjacent planting.	Low	Not very tolerant of extreme climate conditions.	Wooly beech aphid, *Phyllaphis fagi*	N	N	6'+	Cultivars provide different leaf characteristics and color. Does best in larger parks, wide medians or city parkways instead of ROW planting.
Liriodendron tulipifera	Tuliptree	N/A	Magnoliaceae	NN	60'-80'	30'-60'	Tolerates well-drained, moderately moist soil. Tolerant of wet conditions.	Sun - part shade	D	Upright, loose form	Birds, butterflies, pollinators	Yellow	Large, open shaped branching. Leaves are a tulip shape. Flowers are green and orange.	Moderate	Not tolerant of drought.	Susceptible to aphids and powdery mildew.	N	N	8.5'+	Better suited to large landscape areas than within a ROW. Honeydew may occur from aphids.

Metasequoia glyptostroboides	Dawn redwood	N/A	Cupressaceae	NN	70'-100'	15'-25'	Moist, well-drained, humusy soils that are slightly acidic. It can tolerate wet soil but is intolerant of early freezes.	Full sun - light shade	D	Pyramidal	Not a major resource	Brown	Deciduous conifer, attractive bark and branching, fern-like needles, can be low branching, living fossil.	High	Tolerates a variety of climates, tolerates harsh environmental conditions, tolerates wind and flooding, tolerates drought.	No serious insect or disease problems. Canker, spider mites and Japanese beetles are a possibility	N	Y	6'+	Well suited for ROW, but provide enough space for low branching away from sidewalk.
Quercus acutissima	Sawtooth oak	N/A	Fagaceae	NN	40'-60'	30'-50'	Humusy, medium moisture, well-drained soils. Adaptable to a wide range of soil conditions.	Sun	D	Round	Raptors, birds, small mammals, bees	Orange-Brown	Distinctive toothed leaf, acorns are feathered on the cap.	High	Drought tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	Y	Y	6'+	
Quercus bicolor	Swamp white oak	N/A	Fagaceae	NN	50'-60'	50'-60'	Moist, well-drained, acidic soils. Tolerates heavy and moist soils, and can even manage drought conditions once established.	Sun	D	Pyramidal when young	Insects, butterflies, moths, small mammals, birds	Red-Orange	Leaves have fuzzy undersides, rounded lobes to leaf, acorns have a bristly cap.	High	Moderately drought tolerant, wet tolerant, tolerates a variety of soils.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus coccinea	Scarlet oak	N/A	Fagaceae	NN	50'-70'	40'-50'	Moist, well-drained to wet soil. It can grow in a variety of soils, but thrives best in slightly acidic, fertile, sandy, and well-drained soil.	Full sun - light shade	D	Upright, horizontal branching	Insects, butterflies, moths, small mammals, birds	Red	Vibrant fall foliage. Deeply incised c shaped lobes. Acorns are smooth.	High	Moderate drought tolerance, tolerates poor urban soils.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus frainetto	Italian oak	'Schmidt'	Fagaceae	NN	60'-100'	40'-50'	Constant moisture to ensure healthy foliage. Tolerates a variety of soil moisture levels, including very dry, dry, moist, and wet.	Full sun - light shade	D	Densely branched, oval	Insects, butterflies, moths, small mammals, birds	Orange	Distinct, heavily lobed leaf. Acorns have small caps and long seeds.	High	Drought tolerant, heat tolerant, tolerates temporary water logging.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus garryana	Oregon white oak	N/A	Fagaceae	N	50'-80'	50'-60'	Prefers moist to dry soil. It grows best in deep, rich, well-drained soils. Prefers wet winters and dry summers.	Full sun - light shade	D	Oval, vase shaped	Birds, small mammals, reptiles and amphibians, moths	Orange-Yellow	Distinctive form and branching. Acorns have a bristled cap.	High	Drought tolerant once established.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus imbricaria	Shingle oak	N/A	Fagaceae	NN	40'-60'	40'-60'	Moist, well-drained, acidic soil. Tolerant of moderately dry conditions. Tolerant of wet sites once established.	Full sun - light shade	D	Upright	Insects, butterflies, moths, small mammals, birds	Brown-Red	Shiny, smooth unlobed leaf. Acorns are small.	High	Drought tolerant, pollution tolerant, tolerates poor soils and salt air.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	Y	Y	6'+	
Quercus kelloggii	California black oak	N/A	Fagaceae	NN	30'-80'	40'-50'	Moist, acidic soil. Drought tolerant once established.	Full sun - light shade	D	Oval	Insects, butterflies, moths, small mammals, birds	Brown-Yellow	Small statured oak, shiny heavily lobed leaf. Acorn is moderately sized.	Moderate	Drought tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	

Quercus lobata	Valley oak	N/A	Fagaceae	NN	50'-80'	50'-60'	Prefers alternating dry and moist soil conditions. Tolerates a variety of soils, including acidic, alkaline, loamy, moist, sandy, well-drained, and clay soils.	Full sun - light shade	D	Horizontal, loosely branched	Insects, butterflies, moths, small mammals, birds	Brown-Yellow	Broad, open form. Deeply incised leaf and long acorn.	Low - Moderate	Short-term drought tolerant, heat tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	N	6'+	
Quercus macrocarpa	Bur oak	N/A	Fagaceae	NN	30'-80'	50'-80'	Prefers alternating dry and moist soil conditions. Tolerates a variety of soils, including acidic, alkaline, loamy, moist, sandy, well-drained, and clay soils.	Full sun - light shade	D	Oval	Insects, butterflies, moths, mammals, birds	Brown-Yellow	Round lobed irregularly incised leaves, acorns are almost entirely encased in their bristly cap.	Moderate	Drought tolerant, alkaline soil tolerant, pollution tolerant, fire resistant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus muehlenbergii	Chestnut oak	N/A	Fagaceae	NN	40'-60'	40'-60'	Moist to dry, well-drained soil.	Full sun - light shade	D	Horizontal, oval	Insects, butterflies, moths, mammals, birds	Brown-Yellow	Shiny, dentate leaf, small capped acorn.	Moderate	Drought tolerant, air pollution tolerant, shade tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus rubra	Red oak	N/A	Fagaceae	NN	50'-70'	40'-60'	Can grow in dry or moist soil. Prefers moist, well-drained loamy soils with a slightly acidic pH. Drought tolerant once established.	Full sun - light shade	D	Upright, broad	Insects, butterflies, moths, mammals, birds	Red	Pointy lobes, large form, trunk with white streaks, moderate 'classic' acorn.	High	Drought tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus velutina	Black oak	N/A	Fagaceae	NN	40'-60'	40'-50'	Moist, rich, acidic, well-drained soil. Tolerates a variety of soil conditions.	Full sun - light shade	D	Upright, pyramidal when young	Insects, butterflies, moths, mammals, birds	Brown-Yellow	Shiny, with pointy lobes. Small round acorn.	High	Very drought tolerant. Tolerates tough urban soils.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus wislizenii	Interior live oak	N/A	Fagaceae	NN	30'-70'	40'-80'	Dry, shallow, well-drained loams. Does well in a variety of pH and soil types.	Full sun - light shade	E	Round, vase shaped	Insects, butterflies, moths, mammals, birds	N/A	Evergreen, tough leaves. Some leaves are smooth and some have holly shaped leaves.	Low - Moderate	Very drought tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	N	6'+	
Tilia americana	American basswood	'Redmond',	Malvaceae	NN	75'-100'	40'-60'	Coarse, well-drained soils. Moist, fertile loams. Can tolerate dry and clay soils.	Sun - part shade	D	Upright, densely branched	Bees, insects, small mammals, birds	Yellow	Fragrant flowers in spring, large dramatic branch structure.	Moderate	Drought tolerant.	Anthracnose, leaf blight, canker, leaf spots, powdery mildew, and verticillium wilt, linden borer, linden looper, cankerworm, gypsy moth, tent caterpillar, aphids, Japanese beetle	N	Y	5'+	'Redmond' can be planted in smaller strips (4 ft) than other cultivars. Honeydew may occur from aphids.
Ulmus americana	American elm	'Jefferson', 'Princeton', 'Morton', 'Morton Glossy', 'Patriot'	Ulmaceae	NN	80'-100'	60'-80'	Best in rich, well-drained loams. Tolerates a variety of pH.	Sun - part shade	D	Upright, vase shaped	Birds, small mammals	Yellow	Large, vase shaped form. Some cultivars are more susceptible to Dutch elm disease than others.	Low - Moderate	Moderate drought tolerance, short-term flood tolerance, air pollution, poor drainage and	Elm leaf beetles, Japanese beetles, gypsy moths, leafminers, aphids, eriophyid mites, and wood-boring pests, Dutch elm disease, anthracnose, powdery mildew,	N	Y	6'+	Cultivars are more resistant to Dutch elm disease than the straight species.

															soil salt tolerant.	trunk canker, and leaf spot diseases.				
MEDIUM TREES																				
Acer rubrum	Red maple	'Armstrong', 'Autumn Flame', 'Autumn Spire', 'Bowhall', 'October Glory', 'Scarsen', 'Karpick', 'Red Sunset'	Sapindaceae	NN	40'-60'	30'-50'	Moist, slightly acidic soils, tolerates most soils.	Full sun - light shade	D	Round, oval	Birds, bees, small mammals	Red-Orange	Showy autumn foliage, pale bark, root systems may disrupt paving.	Moderate	Tolerates urban conditions, including pollution and road salt.	Verticillium wilt, anthracnose, leaf spot, tar spot, powdery mildew, gall mites, leafhoppers, aphids, cankerworms, maple worms	Y	Y	5'+	Size and certain characteristics may vary based on cultivar. Bark is thin and may be damaged by mowers. Root plate may be shallow and disrupt sidewalks.
Acer x freemanii	Freeman maple/ Autumn Blaze maple	'Autumn Blaze'	Sapindaceae	NN	40'-60'	30'-50'	Moist, slightly acidic soils, tolerates most soils.	Full sun - light shade	D	Pyramidal to oval	Birds, bees, small mammals	Red	No seeds, showy autumn foliage.	High	Tolerant of air pollution, some drought tolerance.	Resistant to most disease	Y	Y	5'+	Appropriate for both street trees and landscape areas.
Betula albosinensis var septentrionalis	Chinese red birch	'Bowling Green', 'China Ruby', 'Chinese Garden',	Betulaceae	NN	30'-50'	30'-40'	Well-drained, moist soil.	Sun - part shade	D	Pyramidal to oval, may be multistem	Birds and bees	Yellow	Beautiful bark.	Moderate	Not tolerant of hot, dry conditions. Does well in the PNW.	Somewhat resistant to Bronze birch borer	Y	N	5'+	Better suited for landscape areas than street trees. The variety *septentrionalis* does best in the PNW.
Carpinus betulus	European hornbeam	'Globosa', 'Fastigiata', Emerald Avenue,	Betulaceae	NN	30'-50'	25'-30'	Can tolerate a range of soil types.	Sun - part shade	D	Upright, spreading oval	Birds, small mammals	Yellow	Slow grower, sinewy bark.	High	Very well adapted to urban conditions. Tolerant of drought, different soil pH levels, and light availability.	Very few diseases or pests	Y	Y	4'+	Appropriate for both street trees and landscape areas.
Cornus 'Eddie's White Wonder'	Eddie's White Wonder dogwood		Cornaceae	NN	30'-50'	15'-20'	Moist, well-drained, acidic soil. Does not tolerate standing water. Keep roots cool and moist in summer.	Sun in a.m. and shade in p.m.	D	Upright, loosely vertical branching	Birds, small mammals	Red	Blooms in March and April. Large white bracts and attractive form. Specimen tree.	Moderate	More climate resilient than the native Pacific dogwood.	Beetle borers and scales, Anthracnose, Phytophthora, Root rot	Y	Y	4'+	
Cryptomeria japonica	Japanese cedar	'Sekkan Sugi'	Cupressaceae	NN	40'-60'	20'-25'	Moist, well-drained, acidic soil. Not tolerant of soggy soil.	Full sun - light shade	E	Pyramidal, narrow branching	Not a major resource	N/A	Attractive evergreen needles and form.	Moderate	Not tolerant of extreme cold, adaptable moisture requirements.	Fire blight, cedar hawthorn rust, hawthorn leaf blight	N	Y	4'+	
Cupressus bakeri	Baker cypress	N/A	Cupressaceae	NN	30'-40'	25'-30'	Dry to average moisture, well-drained soil. Tolerates different pH levels. Does not tolerate standing water.	Sun	E	Pyramidal	Small mammals	N/A	Blue-gray scale-like evergreen foliage.	Moderate	Very drought tolerant.	Damping off fungi, mistletoe	N	Y	6'+	
Davidia involucrata	Dove-tree	N/A	Nyssaceae	NN	40'-50'	25'-30'	Moist, well-drained, and organically rich soil. Not drought tolerant.	Sun - part shade	D	Oval	Bees	Orange-Yellow	Unique white bracts in spring that resemble doves.	Moderate	Not drought tolerant.	No serious insect or disease problems.	N	Y	6'+	
Eucommia ulmoides	Hardy rubber tree	N/A	Eucommiaceae	NN	40'-50'	30'-40'	Moist, well-drained soil. Tolerant of a wide range of soil conditions. Does not	Sun	D	Loosely oval	Birds, some pollinators	Red-Orange	Leaks latex when cut, dark green leaves and samaras. Inconspicuous flowers.	High	Drought tolerant once established, can tolerate	No serious insect or disease problems.	N	Y	6'+	

							tolerant soggy conditions.							wet conditions.					
Ginkgo biloba	Ginkgo	Saratoga', 'Autumn Gold', 'Fairmount', 'Halka', 'Maygar', 'JFS-UGA2', 'Shangri-La', 'Emperor', 'The President'	Ginkgoaceae	NN	40'-60'	30'-40'	Tolerate a wide range of soil conditions, including alkaline and acidic soils, compacted soils, and saline conditions.	Full sun - light shade	D	Upright, pyramidal when young	Not a major resource	Yellow	Very unique leaves, strong fall color, do not plant female trees to avoid foul-smelling fruits.	High	Drought tolerant once established. Tolerant of poor, urban soils.	Root-knot nematodes and phytophthora root	Y/N	Y	4'+	Cultivars can range in sizes.
Gleditsia triacanthos var inermis	Thornless, seedless honeylocust	Christie', 'Shademaster', 'Skycole'	Fabaceae	NN	40'-50'	30'-40'	Moist, well-drained soil with a rich organic content. Tolerates a variety of soil conditions, including compacted soil, poor soils, drought, and flooding.	Full sun - light shade	D	Open loosely horizontal	Pollinators, small mammals, large mammals	Yellow	Low-maintenance and bipinnately compound leaves. Only plant thornless and fruitless varieties.	High	Tolerant of heat, urban conditions, salt.	Borers, webworms, leafhoppers, leaf miners, spider mites, plant bugs, canker, bagworm, and podgall midge, Canker, root collar rot, powdery mildew, and tarry leaf spot	Y	Y	4'+	
Gymnocladus dioicus	Kentucky coffeetree	'Espresso', True North	Fabaceae	NN	40'-60'	30'-40'	Moist, well-drained soil. Tolerant of a wide range of soil conditions. Tolerant of various pH levels.	Sun	D	Upright	Not a major resource	Yellow	Distinct large seed pods. Compound leaves.	High	Tolerates drought, pollution, road salt, urban conditions.	Verticillium Wilt	Y	Y	6'+	
Halesia tetraptera	Carolina silverbell	N/A	Styracaceae	NN	30'-40'	30'-40'	Prefers medium -moisture, well-drained, organically rich, and somewhat acidic soil. Avoid compacted soil.	Full sun - light shade	D	Oval	Butterflies, bees, small mammals	Yellow	Large white bell-shaped flowers in spring. Flowers before leaf-out.	High	Pest resistant but not drought resistant.	Pest and disease resistant	Y	Y	6'+	Damaged by winds.
Juglans regia	English walnut	'Carpathian'	Juglandaceae	NN	40'-60'	40'-60'	Deep, well-drained, permeable soil. Does not like soggy soils.	Sun - part shade	D	Densely branched, oval	Mammals and birds	Yellow	Compound leaves, dramatic form, edible walnuts.	High	Moderate drought tolerance, requires little maintenance.	Blight, leaf blotch, crown gall, thousand cankers, husk fly	N	Y	6'+	
Magnolia 'Elizabeth'	Elizabeth magnolia		Magnoliaceae	NN	40'-60'	20'-30'	Well-drained, consistently moist soil. Tolerates a variety of soils, does not tolerate standing water.	Sun - part shade	D	Loosely branched, oval	Pollinators	Brown-Yellow	Pale yellow flowers that emerge before leaf out in early spring. Fuzzy buds. Dark, shiny leaves.	Moderate	Drought tolerant once established, tolerant of heat, cold winter.	Leaf spots, anthracnose, canker, dieback and powdery mildew.	Y	Y	4'+	
Magnolia grandiflora	Southern magnolia	'Victoria'	Magnoliaceae	NN	40'-60'	30'-40'	Well-drained, consistently moist soil. Tolerates a variety of soils, does not tolerate standing water.	Sun - part shade	E	Pyramidal when young	Pollinators	N/A	Evergreen, dark, leathery, glossy foliage. Large, intermittent creamy blossoms emerge throughout the spring and summer. Makes an attractive hedge.	Moderate	Drought tolerant in planting areas with ample soil volume, heat tolerant.	Sooty mold, leaf spot, powdery mildew, canker	Y	Y	4'+	Damaged by winds. Makes a good screen.
Nyssa sylvatica	Tupelo, black gum	'JFS-PN Legacy1', 'David Odom', 'Firestarter', 'Haymanred',	Nyssaceae	NN	40'-60'	30'-40'	Moist, acidic, well-drained soil. It can grow in medium to wet soils,	Full sun - light shade	D	Pyramidal to upright	Birds, bees, mammals	Red	Dramatic red foliage in fall, glossy dark leaves, horizontal branching.	High	Tolerates drought and standing water, fire resistant,	No serious insect or disease problems. Canker, leaf miner, scale.	Y	Y	4'+	'Gum Drop' can be in 3 Ft planting strip. Well suited tree for bioretention cells.

		"Sheri's Cloud', 'Wildfire'					tolerate poorly-drained soils, and can even grow in standing water.							shade tolerant.					
Phellodendron amurense	Cork tree	'His Majesty', 'Longenecker', 'Macho'	Rutaceae	NN	30'-40'	30'-40'	Moist, well-drained soil, but can tolerate dry soil and a wide range of soil pH levels.	Full sun - light shade	D	Loosely branched, oval	Not a major resource	Yellow	Small yellow-green flowers, black drupes, attractive bark, dramatic crown.	High	It is tolerant of shade, road salt, drought, dry soils, and urban pollution.	No serious insect or disease problems.	Y	Y	4'+	
Pinus contorta ssp *contorta*	Shore pine	N/A	Pinaceae	N	40'-60'	40'-60'	Tolerates a wide variety of soil conditions, including sandy and poorly drained.	Sun	E	Irregular oval	Butterflies, moths, small mammals, birds	N/A	Often multi-leader, grows in an irregular form instead of upright. Good conifer for smaller planting locations.	Moderate	Tolerant of soils conditions and salt spray. May be intolerant of heat.	Pine beetles and borers	N	N	6'+	
Quercus chrysolepis	Canyon live oak	N/A	Fagaceae	NN	50'-60'	30'-40'	Moist soil until established. Drought tolerant once established. Well-drained sandy loam or heavier soil with good moisture but not wetness. Tolerates many soils, including clay, loam, sand, acidic, alkaline, and occasionally wet.	Full sun - light shade	E	Horizontal branching, oval	Birds, small mammals, large mammals	N/A	Evergreen with thick foliage. Acorns are long and smooth. Dramatic branching and crown.	Moderate	Tolerates drought once established, tolerates salt spray.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	N	6'+	
Quercus ilex	Holly oak	N/A	Fagaceae	NN	30'-40'	30'-40'	Prefers moist soils. Tolerant of a variety of soil types. Tolerant of maritime exposure and not drought tolerant.	Full sun - light shade	E	Horizontal, oval	Butterflies, birds	N/A	Evergreen, serrated, shiny holly-like leaves. Acorns are long and smooth.	High	Drought tolerant once established.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	Y	Y	6'+	
Quercus palustris	Pin oak	N/A	Fagaceae	NN	50'-70'	30'-40'	Moist, acidic soil. Tolerate wet feet and occasional shallow standing water, but don't tolerate alkaline soils or droughts.	Full sun - light shade	D	Upright, horizontal branching	Birds, small mammals, large mammals, reptiles, frogs	Red-Orange	Distinct horizontal and downward branching form, small, round acorns.	High	Short-term drought tolerant, cold tolerant, wet tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus phellos	Willow oak	N/A	Fagaceae	NN	50'-70'	40'-60'	Best in moist, constantly wet soil. Requires slightly acidic soil. Wet to moist alluvial soils that are deep and uncompacted. Drought tolerant once established.	Full sun - light shade	D	Upright, vase shaped	Birds, butterflies	Brown-Yellow	Thin, lobeless, willow-shaped leaves, acorns are tiny and round.	Moderate	Somewhat drought tolerant, tolerant of wet conditions.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	

Quercus robur	English oak	Skyrocket'	Fagaceae	NN	50'-70'	20'-30'	Moist, well-drained loams. It can grow in medium moisture, well-drained soils, and can tolerate drought. Can tolerate heavy clay soils.	Full sun - light shade	D	Wide, round	Bees, birds, butterflies, mammals	Brown	Fastigiata' is a common upright, narrow form. Round lobed leaf, long smooth acorns.	High	Drought tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	Y	Y	6'+	
Quercus shumardii	Shumard oak	N/A	Fagaceae	NN	50'-60'	30'-40'	Can tolerate a wide range of soil conditions, including dry, moist, and wet soils. It prefers rich, deep, well-drained soils with a variable pH.	Full sun - light shade	D	Upright	Bees, birds, butterflies, mammals	Red	Deeply incised lobes, moderate round acorn, smaller stature oak.	High	Drought tolerant, urban conditions tolerant including poor drainage, compacted soils and air pollution.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Quercus suber	Cork oak	N/A	Fagaceae	NN	50'-70'	40'-60'	Moist, well-drained soils, variety of soil types, does well in coastal locations, likes dry summers.	Full sun - light shade	D	Horizontal, loosely branched	Bees, birds, mammals	Orange-Yellow	Serrated leaf with white underside, long acorn with bristly cap, thick, corky bark.	Low - Moderate	Salt tolerant, drought tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	N	Y	6'+	
Styphnolobium japonicum	Japanese pagoda tree	N/A	Fabaceae	NN	50'-60'	50'-60'	Moist soil, and a variety of soil conditions can tolerate wet soils for limited time.	Full sun - light shade	D	Horizontal, oval	Bees	Yellow	Compound leaf, pea-like yellow flowers and pods.	High	Drought tolerant.	Pest and disease resistant	N	Y	6'+	
Taxodium distichum	Bald cypress	'Mickelson'	Cupressaceae	NN	50'-60'	30'-40'	Tolerant of variety of average to wet soils. Can tolerate long periods of standing water.	Sun - part shade	D	Pyramidal	Moths, birds, amphibians, reptiles	Orange-Red	Deciduous conifer, attractive bark and branching, only develops knees in permanently wet conditions.	High	Very tolerant of urban conditions and air pollution.	No serious diseases and only occasional pests. Gall mites, spider mites, bagworms.	N	Y	5'+	'Mickelson' can be in smaller planting strips (4 ft) than the straight species.
Ulmus 'Homestead'	Homestead elm	N/A	Ulmaceae	NN	50'-60'	30'-40'	Average to dry, well-drained soils that are moist to average. It can also tolerate wet soil and short floods.	Sun - part shade	D	Pyramidal to oval	Small mammals, birds	Yellow	Rapid growth, vase shape branching.	High	Disease resistant, drought tolerant, heat tolerant.	Resistant to Dutch Elm disease but susceptible to the Elm Leaf beetle. Resistant to spongy moth.	N	Y	4'+	
Ulmus parvifolia	Chinese or Lacebark elm	'Frontier', ''Emer I', 'Emer II'	Ulmaceae	NN	50'-60'	30'-40'	Tolerates wet and dry conditions, a variety of pH, tolerates a variety of climates.	Sun - part shade	D	Upright, vase shaped	Small mammals, birds	Yellow	Rapid growth, vase shape branching.	Moderate	Disease resistant, drought tolerant, heat tolerant.	Elm leaf beetles, Japanese beetles, gypsy moths, leafminers, aphids, eriophyid mites, and wood-boring pests, Dutch elm disease, anthracnose, powdery mildew, trunk canker, and leaf spot diseases	N	Y	4'+	
SMALL TREES																			
Acer circinatum	Vine maple	Monroe', 'Pacific Fire', JFS-Purple;, 'Sunny Sister'	Sapindaceae	N	25'-30'	15'-20'	Tolerant of a variety of soils, prefers fertile, moist, acidic soil.	Part sun - shade	D	Upright, spreading, multistem	Supports bees and butterflies	Red	Typically multistem, loose open form, colorful fall foliage.	Moderate	Tolerant of dry summers once established.	Very few diseases or pests. Verticillium wilt, Japanese beetle.	Y	N	4'+	Multi-stem and low branching make this better suited for landscape areas than street trees.

Acer ginnala	Amur maple	'Embers', 'Flame', 'Ruby Slippers'	Sapindaceae	NN	15'-20'	15'-20'	Very adaptable, best in well-drained soil.	Full sun - light shade	D	Rounded, open, may have multistem	Not a major resource	Orange-Red	Fragrant flowers, fast growing, variable fall color.	High	Adaptable and resilient. May become aggressive.	Very few diseases or pests	Y	Y	3'+	May need low branch pruning. Avoid planting this tree adjacent to natural areas. Not invasive in the PNW, but has been listed in certain mid-west and eastern states.
Acer grandidentaum	Rocky Mt Glow maple / Bigtooth maple	'Schmidt'	Sapindaceae	NN	20'-25'	15'-20'	Tolerant of poor soil, drought tolerant once established.	Full sun - light shade	D	Open, round	Not a major resource	Orange-Red	fast growing, variable fall color, urban tolerant.	High	Adaptable and resilient. May be good in tough spaces.	Very few diseases or pests	Y	Y	3'+	Appropriate for both street trees and landscape areas.
Acer griseum	Paperbark maple	Aroy', 'Cinnamon Flake', 'Molly Fordham', Fireburst, 'Ginzam'	Sapindaceae	NN	25'-30'	25'-30'	Well-drained, acidic, moderately moist, adaptable once established. Somewhat drought tolerant.	Full sun - light shade	D	Upright, oval	Not a major resource	Brown-Red	Attractive exfoliating orange bark. Often multi-stemmed.	High	Somewhat drought tolerant.	Very few diseases or pests	Y	Y	3'+	Appropriate for both street trees and landscape areas.
Acer japonicum	Fullmoon maple	'Aconitifolium', 'Aureum', 'Ed Wood #2', 'Vitifolium', Bloodgood	Sapindaceae	NN	10'-15'	10'-15'	Moist, well-drained soil that's high in organic matter and slightly acidic.	Full sun - light shade	D	Horizontal	Birds, bees	Red	Attractive small specimen maple grown for its leaves and trunk shape. Full palmate leaves reminiscent of a full moon. Some cultivars have red leaves and some have green leaves.	Low	Not tolerant of extreme cold, adaptable moisture requirements.	Anthracnose, leaf spot, tip blight, Japanese beetle, Asian longhorn beetle, aphids, verticillium, scale.	Y	N	3'+	Not appropriate as a street tree often, due to size and multi-stem leader. Better in a landscape setting.
Acer palmatum	Japanese maple	Many cultivars, refer to local nursery	Sapindaceae	NN	15	15	Moist, well-drained soil that's high in organic matter and slightly acidic.	Full sun - light shade	D	Horizontal	Birds, bees, small mammals	Red	Attractive small specimen maple grown for its leaves and trunk shape. Deeply incised leaves that are typically red year round.	Low	Not tolerant of extreme cold, adaptable moisture requirements.	Anthracnose, leaf spot, tip blight, Japanese beetle, Asian longhorn beetle, aphids, verticillium, scale.	Y	N	3'+	Not appropriate as a street tree often, due to size and multi-stem leader. Better in a landscape setting.
Acer triflorum	Roughbark maple, three-flowered maple	N/A	Sapindaceae	NN	15'-20'	25'-30'	Moist, acidic, well-drained soil.	Full sun - light shade	D	Oval	Not a major resource	Red-Orange	Attractive, peeling bark, dense foliage.	High	Tolerates a variety of climates.	Very few diseases or pests, verticillium wilt	Y	Y	3'+	Appropriate for both street trees and landscape areas.
Amelanchier x grandiflora	Apple serviceberry	'Autumn Brilliance', 'Ballerina', Princess Diana', ' Robin Hill'	Rosaceae	NN	15'-20'	15'-20'	Prefers moist, acidic soils but is adaptable to a variety.	Full sun - light shade	D	Oval, sometimes multistem	Bees, birds, small mammals	Orange-Red	The cultivar is sometimes single stem, white flowers in spring. Edible berries.	Moderate	Moderately resilient to urban environments.	Rust	Y	N	3'+	May be small as a street tree. Better suited for small urban plantings.
Arbutus unedo	Strawberry tree	'Marina'	Ericaceae	NN	25'-30'	15'-20'	Well drained soils.	Full sun - light shade	E	Oval	Bees, birds, moths, butterflies	N/A	Attractive peeling bark, evergreen foliage, orange-red fruits, bell-like flowers, slow grower.	Moderate	Drought tolerant, tolerates urban conditions.	Canker, leaf and twing miners	Y	N	3'+	May be small as a street tree. Better suited for small urban plantings.
Asimina triloba	Common pawpaw	'Alleghany', 'Overleese', 'Potomoc', 'Shenandoah', 'Sunflower'	Annonaceae	NN	15'-20'	15'-20'	Moist, acidic soils. Tolerant of a variety of soil textures.	Sun/ shade	D	Loosely pyramidal	Insects, small mammals	Yellow	Edible fruit, does well shade.	Moderate	Tolerant of heat.	Very few diseases or pests	Y	N	3'+	Cultivars are based on fruit more than form. May be better suited as a landscape tree than a street tree
Callitropsis nootkatensis	Alaska yellow cedar	'Pendula'	Cupressaceae	N	30'-45'	10'-15'	Coarse, moist soil. Adaptable to a variety of soils.	Sun - part shade	E	Pyramidal	Not a major resource	N/A	Pendulous, scale-like leaves. Yellowish, exfoliating bark, small 'soccer ball' shaped cones, small conifer.	Moderate	Not very resilient to climate change. Does not tolerate freezing or wet feet. Does well in urban	Beetle borers, Spider mites, Phytophthora, Root rot, Rust, Aphids, Blight, Bagworms, Juniper scale, Spruce mites.	N	N	4'+	May be too large for a street tree. Better suited for landscape setting.

														environments.					
Carpinus caroliniana	American Hornbeam, ironwood	Palisade, 'Uxbridge', Firespire, Native Flame, Fire King	Betulaceae	NN	25'-30'	15'-20'	Rich, moist soils, tolerates a range of pH.	Sun - part shade	D	Upright-spreading, low branched	Butterflies, small mammals	Red-Orange	Fine textured, sinewy smooth bark.	High	Tolerant or urban conditions once established.	Very few diseases or pests	Y	Y	3'+	Appropriate for both street trees and landscape areas.
Catalpa ovata	Chinese catalpa	N/A	Bignoniaceae	NN	25'-30'	25'-30'	Moist, well-drained soils. Tolerant of a range of soils, wet areas and poor soils.	Full sun - light shade	D	Broadly branched, oval	Bees, moths, birds	Yellow	Fast-growing, large leaves, orchid-like fragrant flowers, long seed pods.	Moderate-High	Poor soil tolerant.	Catalpa sphinx moth, verticillium wilt, leaf spot, mildew, twig blight.	Y	Y	4'+	Appropriate for both street trees and landscape areas. Flowers and seed pods can be messy but are very resilient as street trees.
Cercis canadensis	Eastern redbud	N/A	Fabaceae	NN	25'-30'	30'-40'	Moist, well-drained, fertile soil. Not tolerant of wet roots. Tolerant of a range of pH.	Sun to part shade	D	Horizontal, oval	Bees, birds, butterflies	Yellow	Bright pink flowers on branches and bark before it leafs out in spring. Heart shaped leaves. Usually multi-stem.	Moderate	Drought tolerant once established.	Verticillium wilt, canker, borer, aphids, Japanese beetles, leafhoppers, scale.	Y	Y	3'+	Better tree for landscape areas than as a street tree.
Chionanthus retusus	Chinese fringetree	N/A	Oleaceae	NN	25'-30'	35'-40'	Adaptable to pH.	Sun-part shade	D	Oval, often multi-stem	Birds, mammals	Yellow	White flowers, fruits, shedding bark, slow growth rate.	High	Drought tolerant, moisture tolerant. Needs watering in hot weather.	Pest and disease resistant	Y	Y	3'+	Appropriate for both street trees and landscape areas.
x Chitalpa tashkentensis	Chitalpa	Pink Dawn	Bignoniaceae	NN	30'-40'	25'-30'	Well-drained, medium moisture.	Sun	D	Horizontal	Bees, birds, butterflies	Brown	Attractive, showy pink or white flowers, tropical appearance.	High	Drought tolerant, requires very little water once established.	Powdery mildew, verticillium wilt, root rot, aphids, mealybugs, scale, leaf spot.	Y	Y	4'+	Good tree for tough urban conditions and xeriscaping.
Cladrastis kentukea	Yellowwood	N/A	Fabaceae	NN	30'-40'	45'-50'	Well-drained soil with medium moisture. Acidic and coarse soil tolerant. Prefers high organic matter.	Full sun - shade	D	Horizontal, oval	Bees, butterflies	Yellow-Apricot	Fragrant, white flowers in spring.	High	Drought tolerant once established. Needs watering in hot weather.	Verticillium wilt, mildew, root decay, and cankers.	N	Y	6 Ft+	Protect from strong wind.
Cornus alternifolia	Pagoda dogwood	N/A	Cornaceae	NN	15'-20'	15'-20'	Moist, well-drained, acidic soil. Tolerates some dry soil periods.	Part shade - shade	D	Horizontally branched	Butterflies, birds, small mammals	Red	White bracts in spring. Striking horizontal branching.	Low	Needs watering in hot weather. Does not tolerate salt.	Anthracnose, leaf and flower blight (botrytis), crown canker, bacterial leaf scorch, powdery mildew, and septoria leaf spot	Y	N	3'+	Better tree for landscape areas than as a street tree.
Cornus kousa var. 'Chinensis'	Chinese kousa dogwood		Cornaceae	NN	25'-30'	15'-20'	Well-drained soil with medium moisture. Acidic and coarse soil tolerant. Prefers high organic matter.	Sun or shade	D	Horizontally branched	Butterflies, birds	Red	White or pink bracts in spring. Attractive bark and fruit.	Moderate	More climate resilient than *C. florida.*	Scale, leaf blight, dogwood borer, powdery mildew	Y	Y	3'+	
Cotinus obovatus	American smoke tree	N/A	Anacardiaceae	NN	20'-25'	20'-25'	Performs well in dry to moist, well-drained soils. Tolerant of a variety of soils, but not soggy or wet. Does well in poor or rocky soils.	Sun - part shade	D	Densely branched, oval	Butterflies, birds, bees	Red-Purple	Flowers are nondescript, but their stems are what create the attractive smoke effect. Attractive leaves and fall color.	High	Thrives in tough conditions and some neglect.	No serious insect or disease problems.	Y	Y	4'+	

Crataegus x lavallei	Lavalle hawthorn	N/A	Rosaceae	NN	20'-25'	20'-25'	Well-drained, moist soil. Adaptable to dry and moist growing conditions. Does not like standing water.	Full sun - light shade	D	Oval	Birds	Orange-Red	Dense, dark green leaves, white flowers in spring, and attractive berries in fall. Long thorns (~2 inches).	High	Dense, dark green leaves, white flowers in spring, and attractive berries in fall. Long thorns (~2 inches).	Fungal leaf spots, powdery mildew, cankers, apple scab, leaf blight and twig blight	Y	Y	4'+	Good street tree, but care should be taken to plant so that branches clear sidewalk due to thorns.
Frangula purshiana	Cascara	N/A	Rhamnaceae	N	20'-40'	10'-30'	Moist, well-drained, rich in organic matter soil. Tolerant of a variety of pH.	Part-full shade	D	Upright, pyramidal when young	Supports birds and insects	Purple	Dark, strongly veined leaves. Dark purple berries. Supports wildlife.	High	Drought tolerant, especially in shade. Cold tolerant. Low maintenance.	Few problems. Aphids, crown rust.	Y	Y	4'+	
Hovenia dulcis	Japanese raisintree	N/A	Rhamnaceae	NN	30'-40'	20'-25'	Moist, well-drained soil. Tolerant of a variety of soil conditions and pH levels. Does not like soggy conditions. Not tolerant of compacted soil.	Full sun - light shade	D	Densely branched, oval	Bees, butterflies, small mammals	Yellow	Small, yellow-green flowers in spring. Distinct 'raisin'-like fruits.	High	Moderate drought tolerance, occasional wet tolerance.	No serious insect or disease problems.	Y	Y	4'+	
Juniperus scopulorum	Rocky Mountain juniper	N/A	Cupressaceae	NN	30'-40'	10'-30'	Tolerant of a variety of soils. Wet soil will cause root rot.	Sun to part shade	D	Narrow form, pyramidal	Birds, small mammals	N/A	Gray-green scale-like evergreen foliage, fragrant berries.	Moderate	Drought tolerant, requires little maintenance.	Blight and root rot in wet conditions. Aphids, bagworms, twig borers, webworms and scale	Y	N	6'+	
Koelreuteria paniculata	Goldenrain tree	N/A	Sapindaceae	NN	30'-40'	30'-40'	Moist, fertile, well-drained soil.	Full sun - light shade	D	Oval	Butterflies, bees	Orange-Yellow	Sprays of yellow flowers in spring. Papery lantern-like seed pods that change from orange to white in fall.	High	Drought tolerant, requires little maintenance.	Root rot, Leaf spot, Canker, Coral spot fungus, Verticillium wilt, Dieback disease.	Y	Y	3'+	
Lagerstroemia cultivars	Crepe myrtle	'Mukogee', 'Natchez', 'Tuscarora'	Lythraceae	NN	20'-25'	20'-25'	Moderate, tolerates poor drainage.	Sun	D	Vase shaped, multi-stem	Bees	Red-Orange	Showy flowers, long bloom.	High	Drought tolerant, air pollution tolerant, requires little maintenance.	Susceptible to aphids, fungal leaf spot and powdery mildew	Y	Y	3'+	
Maackia amurensis	Amur maackia	N/A	Fabaceae	NN	30'-40'	20'-25'	Moist well-drained soils. Tolerant of a variety of pH.	Full sun - light shade	D	Horizontal branching, oval	Bees	Yellow	White flower racemes, compound leaves, attractive bark, nitrogen fixing.	High	Tolerant of poor soils.	No serious insect or disease problems.	Y	Y	3'+	
Maclura pomifera	Osage-orange	White Shield', 'Wichita', 'Park'	Moraceae	NN	25'-30'	30'-40'	Tolerates both dry and wet conditions, and can grow in a variety of soil types, including light, medium, and heavy soils.	Full sun - light shade	D	Densely branched, oval	Birds, mammals	Brown-Yellow	Distinct large wrinkled fruit and thorns. "White Shield" is the thornless cultivar. "Wichita", "White Shield" and "Park" are fruitless cultivars. When planting trees with fruit and thorns, recommend for a landscape setting only, not ROW.	Moderate	Hardy tree.	No serious insect or disease problems except cotton root rot	Y	Y	4'+	
Magnolia 'Galaxy'	Galaxy magnolia		Magnoliaceae	NN	30'-40'	20'-25'	Well-drained, consistently moist soil. Tolerates a variety of soils, does not	Sun - part shade	D	Upright, round	Insects	Brown-Yellow	Deep pink flower that emerge before leaf out in early spring. Fuzzy buds. Slightly fuzzy leaves.	Moderate	Moderately drought tolerant once established.	Leaf spots, anthracnose, canker, dieback and powdery mildew.	Y	Y	4'+	

							tolerate standing water.												
Magnolia virginiana	Sweetbay magnolia	N/A	Magnoliaceae	NN	25'-30'	20'-25'	Moist, rich, acidic, and organically rich soils. It can tolerate wet, swampy, and boggy soils, unlike most other magnolias.	Full sun - part shade	D	Upright	Bees, birds, moths	Yellow	White flowers that appear on the tree after leaf out has occurred. Does well in shade.	Moderate	Most drought tolerant of the magnolia tree species. Heat tolerant, cold tolerant.	Sooty mold, leaf spot, powdery mildew, canker	Y	Y	4'+	
Magnolia x loebneri	Loebner magnolia	N/A	Magnoliaceae	NN	25'-30'	25'-30'	Moist, well-drained, preferably acidic to neutral soil. Does not tolerate wet roots.	Full sun - light shade	D	Loosely branched, oval	Bees, birds, butterflies	Yellow	Pink/white flowers that emerge before leaf out. Smaller and wider tree than some other magnolia species.	Moderate	Most sensitive to drought of the magnolia species.	Sooty mold, leaf spot, powdery mildew, canker	Y	N	4'+	Better suited to large landscape areas than within a ROW.
Magnolia x soulangeana	Saucer magnolia	N/A	Magnoliaceae	NN	20'-25'	20'-25'	Consistent and regular moisture in well-drained, acidic, loamy, organically enriched soil.	Full sun - light shade	D	Loosely branched, oval	Bees, birds, butterflies	Brown-Yellow	Profuse pink and white blooms that emerge before leaf out. Fuzzy buds.	Moderate	Cold and pollution tolerant.	Sooty mold, leaf spot, powdery mildew, canker	Y	N	4'+	Better suited to large landscape areas than within a ROW.
Malus 'cultivars'	'Adirondack', ' Red Barron', 'Golden raindrops', 'Donal Wyman', 'Lancelot'		Rosaceae	NN	20'-25'	20'-25'	Well-drained, moist soil. Somewhat drought tolerant once established.	Sun	D	Round to oval	Bees, birds, butterflies	Red-Orange	Variety of showy blossom in spring, cultivars determine the color. Most are deep pink or white. Small fruits in late summer. Manageable size.	High	Moderately drought tolerant.	Spider mites, aphids, and scale insects, canker, fungus	Y	Y	3'+	
Ostrya virginiana	American hophornbeam	N/A	Betulaceae	NN	25'-30'	25'-30'	Moist, well-drained, and slightly acidic, tolerates dry, gravelly soils once established.	Full sun - light shade	D	Round	Birds, mammals, bees, butterflies	Orange	Pointed leaves, catkins in spring, fruit structure look like hops, dense but small crown.	High	Tolerant of drought, cold, wind, ice damage.	No serious insect or disease problems.	Y	Y	4'+	
Oxydendrum arboreum	Sourwood	N/A	Ericaceae	NN	25'-30'	15'-20'	Moist, well-drained, and slightly acidic, tolerates a range of soils.	Sun- part shade	D	Upright	Bees, butterflies	Red-Orange	White bell-shaped flowers, very dramatic fall color, supports pollinators.	High	Tolerates drought and road salt.	Dogwood borer, twig girdler, canker, leaf spot, twig blight, fall webworm	Y	Y	4'+	
Parrotia persica	Persian ironwood	'Inge', 'Vanessa'	Hamamelidaceae	NN	30'-40'	15'-20'	Tolerates a wide range of soils, including clay soil that drains well. Prefers consistent moisture.	Sun - part shade	D	Round	Bees, butterflies	Red-Purple	Small form and dramatic fall color, small red flower clusters.	High	Relatively drought tolerant once established.	No serious insect or disease problems.	Y	Y	3'+	
Pinus flexilis	Limber pine	Vanderwolf's Pyramid'	Pinaceae	NN	30'-40'	15'-20'	Prefers moist, well-drained soil with a mildly acidic pH. It can tolerate drought and can grow in dry, rocky soils.	Sun	E	Pyramidal	Birds	N/A	Grey-green needles, open form, moderate sized cones. Cultivar is much smaller and more dense.	High	Drought tolerant.	White pine blister rust, pine needle scale, sawfly, pine wilt, engraver beetles, canker	N	Y	4'+	Good tree in the ROW for small spaces
Pistacia chinensis	Chinese pistache	N/A	Anacardiaceae	NN	25'-30'	25'-30'	They can grow in a variety of soil types, including clay, loam, sand, and well-drained	Full sun - light shade	D	Densely branched, oval	Birds, small mammals	Red	Compound leaves, spray of red and black fruits.	High	Drought tolerant, heat tolerant.	No serious insect or disease problems.	Y	Y	3'+	

							soil. Tolerates some wet feet.												
Quercus hypoleucoides	Silverleaf oak	N/A	Fagaceae	NN	30'-40'	15'-20'	Prefers moist, well-drained soil. Tolerates a variety of soil types, including sandy, loamy or clay soils.	Full sun - light shade	E	Upright, vase shaped	Not a major resource	N/A	Evergreen gray-green leaf with silvery undersides, small capped acorns.	High	Drought tolerant, cold tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	Y	Y	5'+	
Quercus myrsinifolia	Bambooleaf oak	N/A	Fagaceae	NN	25'-30'	25'-30'	Evenly moist soil and dislikes drought. It prefers acidic to neutral, well-drained, and humus-rich soil. Variety of soil types, including clay, dry/well-drained, and sandy.	Full sun - light shade	E	Densely branched, oval	Birds	N/A	Evergreen, shiny lobeless leaf. Tiny, smooth acorns.	High	Short-term drought tolerant, heat tolerant, wet tolerant.	Oak wilt, chestnut blight, shoestring root rot, anthracnose, oak leaf blister, cankers, leaf spots and powdery mildew.	Y	Y	5'+	
Styrax japonicus	Japanese snowbell	'Emerald Pagoda', 'Pink Chimes', 'JFS-E'	Styracaceae	NN	25'-30'	25'-30'	Moist, slightly acidic, well-drained, organically rich soil.	Full sun - light shade	D	Oval to round	Bees, birds, butterflies	Yellow-Red	Fragrant white or light pink flowers, small fruits.	High	Does not tolerate drought.	Pest and disease resistant	Y	Y	3'+	
Styrax obassia	Bigleaf snowbell	N/A	Styracaceae	NN	25'-30'	15'-20'	Well-drained, acidic soil. Tolerates a variety of soils.	Full sun - light shade	D	Round	Bees, birds, butterflies	Yellow	White, fragrant, bell-shaped flowers on the underside of the stem. Larger flowers than *S. japonicus*.	High	Moderate drought tolerance.	Pest and disease resistant	Y	Y	3'+	Does not tolerate winter winds.
Syringa pekinensis/ reticulata	Tree lilac	'Beijing Gold', 'China Snow', 'Great Wall', 'Ivory Silk', 'Summer Charm', 'DTR 124'	Oleaceae	NN	30'-40'	15'-20'	Moist, well-drained soil. Tolerates dry soil, variety of pH.	Full sun - light shade	D	Oval to round	Bees, birds, butterflies	Yellow-Orange	Showy, white flower clusters, typically multistem.	High	Drought and salt tolerant.	Powdery mildew, scale and borers. Blights, leaf spots, wilt and ring spot virus.	Y	Y	3'+	
Zelkova serrata	Japanese zelkova	City Sprite, 'Musashino', 'Village Green', 'Green Vase'	Ulmaceae	NN	25'-30'	15'-25'	Moist, deep loam soil. Tolerant of a variety of soil types, including sandy and clay.	Sun - part shade	D	Vase shaped, multi-leader	Bees, butterflies	Yellow	Multi-leader, vase shaped, dense crown.	High	Drought and urban conditions tolerant.	Resistant to disease	Y/N	Y	4'+	'City Sprite' can be in 3ft planting strip.

Natural Areas Trees List

City of Redmond Climate Resiliency and Sustainability Vegetation Management Plan

SPECIES		CHARACTERISTICS										PLANTING AND MAINTENANCE					
BOTANICAL NAME	COMMON NAME	NATIVE / NON-NATIVE	MATURE HEIGHT	MATURE WIDTH	WETLAND INDICATOR STATUS	SOIL/ MOISTURE	EXPOSURE	EVERGREEN/ DECIDUOUS	POLLINATORS/ WILDLIFE	AUTUMN COLOR	UNIQUE CHARACTERISTICS	NATIVE HABITAT	EASE OF MAINTENANCE	CLIMATE RESILIENCE	DISEASE AND PEST PROBLEMS	PLANT SPACING (ON CENTER)	NOTES
Abies grandis	Grand fir	N	70'-100'+	20'-35'	FACU	Rich, well-drained, acidic, consistently moist, adaptable once established.	Sun - shade	E	Bees, birds and small mammals	N/A	Dark, fragrant long needles. Pyramidal form.	Upland/moist forest. Plant intermittently with other conifers and hardwoods. Does well in lower elevation, needs ample room to grow.	Moderate	Most resilient native true fir, does well in low elevations.	Balsam wooly adelgid	15'	Not well suited for every restoration site. Use in limited quantities.
Acer circinatum	Vine maple	N	15' - 25'	15'-20'	FAC	Tolerant of a variety of soils, prefers fertile, moist, acidic soil.	Part sun - shade	D	Supports bees and butterflies	Red	Typically multistep, loose open form, colorful fall foliage. Sometimes shrub-like.	Upland/moist woodland or forest. Plant as an understory species.	Low	Tolerant of dry summers once established. Important understory species in moist forests.	Verticillium wilt, Japanese beetle	10'	Does well as a dominant understory species.
Acer glabrum var. *douglasii*	Douglas maple	N	20'-30'	15'-25'	FACU	Good drainage - can tolerate both moist and dry conditions.	Full sun - shade	D	Small and large mammals	Red-Orange	Small understory plant, vibrant fall foliage, sharply toothed leaf, sometimes shrub-like.	Drier, open sites, wetlands, riparian corridors, rocky outcrops. Plant intermittently as an understory species.	Low	Drought and cold tolerant once established.	Verticillium wilt, Japanese beetle, aphids	10'	Not well suited for every restoration site. Use in limited quantities.
Acer macrophyllum	Bigleaf maple	N	50'-100'	40'-75'	FACU	Moist, slightly acidic, well-drained soil. Tolerates a variety of soils.	Sun - shade	D	Bees, butterflies, birds, small mammals	Yellow	Large leaves, often multi-leaders, shallow root system, dominant species in upland forests.	Upland/moist woodland or forest. Can be planted as a dominant hardwood.	Low	Resilient to climate change in forests, somewhat resilient in urban areas. Tolerates poor soils. Important species for restoration.	Beetle Borers, California Flathead Borer and Caterpillars, Sudden Oak Death, Root Rot, Oak Root Rot, Annosus Root Disease, White Mottled Rot, Leaf Spot and Verticillium.	12'	Does well in larger planting areas. Opportunity to add natives species to urban areas. Provides animal habitat.
Alnus rubra	Red alder	N	40' - 80'	20' - 40'	FAC	Prefers moist, rich soils, well-drained gravels and sands, and poorly drained clay and organic soils. Likes wet winters and dry summers.	Sun - shade	D	Deer/elk browse twigs, birds eat seeds, cover/habitat	Brown-Yellow	Quick growing, thin gray bark with black spots, dentate leaves, long or woody catkins.	Moist woodland or riparian corridors, wetlands. Can be planted as a dominant hardwood in wetter locations.	Low	Does well in disturbed sites, and a variety of soils. Pioneer, keystone species for riparian areas.	Limited issues: white heart rot	12'	Host to nitrogen-fixing bacteria, crucial species for habitat restoration. Supports wildlife.
Amelanchier alnifolia	Saskatoon serviceberry	N	6' - 15'	4' - 8'	FACU	Moist to dry, well-drained	Sun or shade	D	Berries provide food for mammals and birds, dense growth provides shelter. Attracts bees and butterflies, host plant for larvae	Red-Orange	White, fragrant blossoms in early spring. Often multi-stem tree. Fruits are edible. Can be shrub-like.	Moist woodlands and stream banks, open prairies, dryer hillsides and open woodlands.	Low	Moderately drought tolerant once established.	Rusts, fireblight, powdery mildew, and Entomosporium leaf, and insects such as elm aphid, saskatoon, sawfly, mites and leaf rollers.	8'	Can be thicket forming. Supports wildlife.
Betula papyrifera	Paper birch	N	50'-70'	25'-50'	FAC	Prefers moist, well-drained, acidic soil. Tolerant of a variety of soils, including sandy and rocky soils. Doesn't tolerate drought, compacted soils.	Part sun - shade	D	Birds, small and large mammals	Yellow	Distinctive thin, white bark, with a papery exfoliation and dark lenticels. Yellow fall color. May be multi-stem or single stem. Long catkins.	Conifer/hardwood forests, boreal forests, rocky outcrops, disturbed habitat.	Moderate	Does not tolerate heat or drought. Pioneer species in cooler areas. Pioneer species for wildfire, avalanche or windthrow areas.	Bronze birch borer, leaf miner, aphids, birch dieback	12'	Not well suited for every restoration site. Use in limited quantities.

Cornus nuttallii	Pacific dogwood	N	15'-40'	10'-25'	FACU	Moist, well-drained, slightly acidic soil, gentle slopes. Cool, rich and deep soils.	Part sun - shade	D	Bees, butterflies, birds, small mammals, large mammals	Red-Orange	Large, white flower bracts in mid-spring. Orange-red drupe in early fall. Delicate understory tree with an upright form.	Low-elevation, coniferous forest or hardwood woodland, stream banks, coastal forests. Plant intermittently as an understory species.	Moderate	Tolerant of seasonal flooding, intolerant of rapid changes in soil temperature.	Dogwood borer, other borers, scale, armillaria root rot, spider mites, crown canker, anthracnose	12'	Not well suited for every restoration site. Use in limited quantities.
Corylus cornuta	Beaked hazelnut	N	8' - 20'	8' - 15'	FACU	Moist, well-drained, slightly acidic soil, organically rich soil.	Sun - part shade	D	Insects , birds, small mammals, large mammals	Orange-Yellow	Considered a small tree or large shrub. Multi-stem with many small branches comprising the trunk. Fuzzy leaf, edible hazelnut in August/September.	Low-elevation, coniferous forest or hardwood woodland, stream banks, forest edges. Plant as an understory species.	Low	Drought resistant.	Armillaria root rot, blight, canker, leaf spot, powdery mildew	8'	Form will be less dense and more spindly in forest understory and more bushy and dense in full sun.
Crataegus douglasii	Black hawthorn	N	15' - 30'	15' - 25'	FAC	Moist, deep, fine-textured soils. Can tolerate streamside conditions, gravels, clays and rocky soils.	Sun - part shade	D	Birds, butterflies	Red-Purple	Can be shrubby, or a small tree. Has thorns, and white flowers in spring. Has black, edible fruit in summer.	Open fields, scrublands, forests and open woodlands.	Moderate	Drought and heat tolerant. Resilient and easy to grow.	Fire blight, leaf beetle, leaf beetle, leaf blight	10'	Thorns. Will form thickets in sunnier, wetter locations.
Frangula purshiana	Cascara	N	20'-40'	10'-30'	FAC	Moist, well-drained, rich in organic matter soil. Tolerant of a variety of pH.	Part sun - shade	D	Supports birds and insects	Orange-Yellow	Dark, strongly veined leaves. Dark purple berries. Supports wildlife.	Open woodlands, upland forest, riparian corridors, riverbanks. Plant as an understory species or on woodland edges.	Low	Drought tolerant, especially in shade. Cold tolerant. Low maintenance.	Few problems: aphids, crown rust	12'	Berries attract birds and wildlife.
Fraxinus latifolia	Oregon ash	N	60'-80'	30'-40'	FACW	Prefers poorly drained, moist bottom lands, rich soil, deep organic matter. Can tolerate rocky, sandy and clay soils.	Full sun - light shade	D	Insects , birds, small mammals, large mammals	Yellow	Pinnately compound leaves, samaras, scraggly form. Seeds are samaras.	Wet habitats, riparian corridors, wetlands, riverbanks, wet meadows. Open, sunny habitat is best. May be the dominant canopy in wet sites.	Moderate	Does well in disturbed sites, and a variety of soils. Emerald ash borer (EAB) infestation will decimate many populations eventually.	Emerald ash borer. A variety of fungi cause leaf spot and powdery mildew. A heart rot can cause an extensive defect in older trees.	12'	Recommend planting in isolated areas or to help retain native ash population when EAB hits. Plant sporadically and not as a monoculture in restoration.
Malus fusca	Oregon crabapple	N	20'-40'	20'-40'	FACW	Does well in a variety of soils, can tolerate salt water, heavy clay soils, poorly drained soils, and well-drained soil.	Full sun - light shade	D	Birds, bees	Red-Orange	Can grow as a large shrub or small tree. Often multistem. Fragrant apple blossoms in spring. Can form a thicket in open and wet locations. Edible fruits in late summer.	Open woodlands, upland or moist forests, wetlands, riparian corridors, stream edges, coastal.	Low	Wet tolerant, and drought tolerant once established.	Susceptible to honey fungus.	12'	Will form thickets in sunnier, wetter locations.
Picea sitchensis	Sitka spruce	N	100'-150'	20'-25'	FAC	Rich, well-drained, acidic, consistently moist, adaptable once established. Tolerates high acidity. Likes moist to wet sandy soils.	Sun - part shade	E	Valuable food source and nesting and roosting site for many birds and small mammals	N/A	Large conifer, sharp needles, papery cones. Tolerant of salt water spray.	Cool coastal forests, moist, coniferous dominant forests, prefers cool moist air.	Moderate	Not drought tolerant for extended periods.	Susceptible to the green spruce aphid, white pine weevil, ambrosia beetle, spruce beetle, scales, adelgids, and spider mites. Galls are caused by the Cooley spruce gall adelgid and are frequently seen. Other potential problems include fungal diseases resulting in root and stem rots.	15'	Not well suited for every restoration site. Use in limited quantities unless in coastal locations well suited to them, then they can be planted as a dominant species.
Pinus contorta ssp contorta	Shore pine	N	45'-65'	10'-15'	FAC	Tolerates a wide variety of soil conditions, including sandy and poorly drained.	Sun - part shade	E	Birds, butterflies, moths	N/A	Often multi-leader, grows in an irregular form instead of upright. Tolerant of salt water spray.	Coastal bluffs, dry conifer forests, rocky areas, very acidic areas.	Moderate	Drought tolerant and salt spray tolerant.	Pitch moth, silverspotted tiger moth, pine shoot moth, pine sheath miners, coneworms	15'	Does well in urban locations in Western WA. Plant in open habitats or forest edges.
Pinus monticola	Western white pine	N	100'-150'	20'-25'	FACU	Well-drained, sandy, acidic soils. Doesn't do well in compacted or poorly drained soils, but tolerant of highly permeable soils.	Sun - part shade	E	Small mammals and birds	N/A	Blue-green appearance to needles, 5 needles per fascicle, very long cones.	Conifer-dominant upland forests, moist lowlands, dry open sites, alpine sites. Tolerates disturbed areas and low-grade fires.	Moderate	Adaptable to variety of climates, drought tolerant once established, fire adapted, high carbon sequestration capabilities.	White pine blister rust, very susceptible to bark beetle	15'	Not well suited for every restoration site. Use in limited quantities.

Populus balsamifera ssp. trichocarpa	Black cottonwood	N	70'-100'+	30' - 50'	FAC	Moist to wet soils. Tolerate poor and dry soils, sandy soils, bottomlands, riverbanks. Does not tolerate dry soils for extended time.	Sun	D	Birds, butterflies, moths	Brown-Yellow	Fast growing, tall tree with furrowed bark and large shiny leaves. Releases 'cotton'-like seed pods in early summer. Can have a scraggly appearance.	Riparian corridors, river and streambanks, open woodlands and forest edges. May be the dominant canopy in riparian areas. Pioneers species in riparian areas.	Low	Wet and flood tolerant. Moderately drought tolerant once established.	Poplar borer, aphids, leaf beetles, gall mite, poplar rust, blight, canker, stem decay, fungal diseases	10'	Does well in urban locations and riparian restoration areas. Can be planted as the dominant species and will self-sow freely. Plant in palustrine forested (PEM) wetland and sparingly in scrub-shrub wetland (PSS) habitats.
Populus tremuloides	Quaking aspen	N	40'-60'	20'-30'	FACU	Rich, moist, well-drained soil or wet soil. Can tolerate poor soil and cold weather. Can tolerate some dry site conditions, clay and alkaline soil. Can by colony forming in its native habitat.	Sun	D	Insects , birds, small mammals, large mammals	Yellow	Distinctive, shimmery leaves and white/gray bark with black branch scars. Bright yellow fall foliage. Catkins.	Typically found in colder climates and alpine areas. In Western WA it can be found in wetlands, stream sides, lake shores and rocky, well-drained soils. While it is a pioneer species in the inter-mountain west, in the PNW it's best planted intermittently with other riparian species.	Low	Tolerant of harsh winters but not heat.	Aphids, sawflies, leaf miner, ten caterpillar, leaf spot, leaf blight, rust, powdery milder, canker	12'	Not well suited for every restoration site. Use in limited quantities.
Prunus emarginata	Bitter cherry	N	10'-30'	10'-30'	FACU	Moist, loam or sandy loam soils with good drainage, but also grows on dry, exposed sites.	Sun - part shade	D	Bees, birds and small mammals	Orange-Brown	Small tree or large shrub. White flowers in the spring, and red fruits in late summer. Can be thicket forming in moist sites and open areas.	Lowland species that grows in open fields, open woodlands, exposed hillsides, disturbed areas.	Low	Can be drought tolerant once established. Does not tolerate excessive rain or extreme weather fluctuations.	Aphids, borers, tent caterpillar, root rot, canker, webspinning mites	12'	Plant as an understory or in groups in open fields. Do not plant as a dominant species.
Pseudotsuga menziesii	Douglas fir	N	90'-200'	40'-45'	FACU	Does best in deep, well-drained, loamy soils with plenty of moisture. It can tolerate seasonally dry conditions. Grows in a variety of soils.	Sun - part shade	E	Butterflies, moths, small mammals, large mammals	N/A	Densely branched evergreen, distinct cones, furrowed bark. Very tall tree.	Moist coniferous forests where it is often the dominant species. Grow in range of elevations and microclimates. Tolerate both dry and wet sites, preferring moist, well drained forests.	Low	Urban tolerant, pollution tolerant, drought tolerant and tolerant of wet feet.	Pine pitch canker, root rot, armillaria, Douglas fir beetle, needlecast	15'	Plant as one of the dominant species in forest restoration. Plant intermittently in riparian restoration.
Quercus garryana	Oregon white oak	N	50'-80'	50'-60'	FACU	Prefers moist to dry soil. It grows best in deep, rich, well-drained soils. Prefers wet winters and dry summers.	Full sun - light shade	D	Birds, small mammals, reptiles and amphibians, moths	Orange-Brown	Distinctive form and branching. Acorns have a bristled cap.	Likes wet winters and dry summers. Grows in oak woodlands, oak savanna, wet meadows, mixed with Douglas fir (or other conifers), meadows, prairie or farmlands.	Moderate	Tolerant of varying moisture conditions.	Oak galls, hairy mistletoe, shoestring root rot, armillaria, butt rot, white pocket rot	15'	Not well suited for every restoration site. Use in open prairie habitat or oak woodland where it can be the dominant canopy species.
Salix hookeriana	Dune willow	N	6' - 20'	6' - 20'	FACW	Moist to wet soils. Can be planted at the edge of standing freshwater. Likes a variety of soil types and pH, as long as it is moist or wet.	Full sun - light shade	D	Earliest food source for bees, birds, small mammals, large mammals	Yellow	Fast growing, considered a small tree or large shrub. Can be thicket forming. Distinctive sulphur yellow leaf buds, simple ovate leaves and yellow/white flowers.	Prefers coastal habitat, marshes and floodplains.	Low	Tolerates disturbed wet areas and poor, flooded soils.	Willow blight, aphids, scale, borer, stem galls	8'	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix lucida ssp. lasiandra	Pacific willow	N	6' - 20'	6' - 20'	FACW	Likes heavy soils, clay soils, alluvial soils, sandy soils, loamy, acidic soils.	Full sun - light shade	D	Earliest food source for bees, birds, small mammals, large mammals	Yellow	Fast growing, considered a small tree or large shrub. Can be thicket forming. Long, shiny, lanceolate leaves with bright colored twigs. Yellow flowers in spring and cottony seed dispersion.	Grows in wet and disturbed locations, streams, lakes and wet ditches, wetlands, riparian areas and floodplains.	Low	Adaptable, intolerant of drought. Responds well to herbivory and fire	Willow scab, watermark disease	8'	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix prolixa	Mackenzies willow	N	12'-30'	15'-20'	OBL	Prefers sandy, wet soils. Tolerates other fine textured soils and moderate to high amounts of water.	Sun - part shade	D	Butterflies, bees, and caterpillars, small mammals	Yellow	Moderately tolerant of drought. Tolerant of flooding and soil saturation.	Grows in riverbanks, wetlands, marshes, sand and gravel bars, wet forest glades	Low	Tolerates disturbed wet areas and poor, flooded soils.	Brown spot, leaf beetles, leaf rot, leaf miners	8'	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.

Salix scouleriana	Scouler's willow	N	10' - 25'	10' - 25'	FAC	Can tolerate low, moderate, and high moisture, and is adaptable and tolerant of sand, loam, and clay.	Full sun - light shade	D	Earliest food source for bees, birds, small mammals, large mammals	Yellow	Fast growing, considered a small tree or large shrub. Can be thicket forming. Round obovate leaves, yellow flowers, fuzzy buds, rusty underside on leaf.	Moist woods, streambanks, lowlands, roadsides, wet meadows, disturbed areas, wetlands.	Low	Adaptable, intolerant of drought.	Black canker, willow blight, powdery mildew, bagworm moth, anthracnose	8'	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix sitchensis	Sitka willow	N	3' - 15'	3' - 15'	FACW	Prefers heavy, wet soils, moist soils, tolerant of flooding and soil saturation, acidic soil.	Sun or shade	D	Earliest food source for bees, birds, small mammals, large mammals	Yellow	Fast growing, considered a small tree or large shrub. Can be thicket forming. Ovate, pointed leaves with iridescent, hairy undersides. White flowers.	Sandy floodplains, gravel bars, streambanks, wetlands, roadside ditches, disturbed areas, forest edges.	Low	Adaptable, intolerant of drought.	Black canker, willow blight, willow scab, crown gall, aphids	8'	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Thuja plicata	Western redcedar	N	50' - 200'	20' - 30'	FAC	Moist, fertile, well-drained soils.	Sun or shade	E	Caterpillar host plant/larval food source, large mammals, butterflies, moths, birds	N/A	Large conifer, dark green fan-like scales, reddish bark that peels in strips, small bluish fleshy cones. Tolerant of dense shade.	Coastal habitats, alpine habitat, lowland riparian habitat, wet forests, wetland edges.	Moderate	Not resilient to heat and drought.	Thuja blight, cedar leaf blight, bagworms, scale, leafminer, spider mites, armillaria root rot, cypress canker	15'	Not as climate adaptable as other species. Avoid planting as a dominant canopy tree until restoration site is better established and soil is moist.
Tsuga heterophylla	Western hemlock	N	50' - 200'	20' - 30'	FACU	Well-drained soil and is suitable for light (sandy), medium (loamy) and heavy (clay) soils.	Sun or shade	E	Birds, small mammals, large mammals	N/A	Large conifer, whorled needle-like leaves, thrives in dense shade. Tiny cones, thick furrowed bark.	Exists in lower elevation, conifer dominant moist forests, temperate rainforests, coastal areas, bottomland habitat. Prefers cool temperatures and humid environments.	Moderate	Not resilient to heat and drought. Tolerates seasonal flooding.	Spotted tiger moth, sawfly, dwarf mistletoe, bracket fungi	15'	Plant as one of the dominant species in forest restoration. Plant intermittently in dry areas or areas that will receive no supplemental watering.

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APPENDIX D

Climate Resilient Rewilding Planting Palettes

HERRERA
Science + Planning + Design

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Climate Resilient Rewilding Planting Palettes

Herrera developed five rewilding species palettes for use in different Redmond ecosystems: Naturalized Meadows (Table D-2), Roadside Meadows (Table D-3), Pollinator Gardens (Table D-4), Wetlands (Table D-5), and Understory (Table D-6). Each palette provides additional information that can be used to select appropriate species for a given location. Table D-1 includes definitions for terms in each list.

Table D-1. Definitions for Rewilding Planting Palettes.

Term	Definition
Disease and pest resistance	Disease and pest resistance in plants refers to the ability of a plant to withstand or repel attacks by pathogens (disease-causing organisms) and pests (harmful insects or animals). Resistant plants can limit the damage caused by diseases and pests without the need for extensive chemical treatments.
Sustainability/ Ease of Maintenance	• Low - Extra care and consideration should be utilized in tree's placement and maintenance. Landscape planting will generally be less maintenance than ROW. • Moderate - May require supplemental watering in hot weather, pruning every 3-5 years, may be susceptible to disease. • High - Easy to maintain, does not require extensive watering once established, pruning or pest management.
Wetland Indicator Status	Wetland indicator status is a classification used to identify plant species based on their association with wetland environments. Plants are categorized as "obligate wetland (OBL)," "facultative wetland (FACW)," "facultative (FAC)," "facultative upland (FACU)," or "obligate upland (UPL)" based on their preference for wetland or upland conditions. Information is based on 2022 National Wetland Plant List (NWPL) for Western Mountain, Valleys, and Coast Region. This information should be updated when the NWPL is updated.

Palettes were developed in conjunction with Redmond staff through a workshop focused on tree canopy expansion and through staff review. The lists should be regularly updated to reflect which species are doing well and/or are expected to do well as the climate continues to change.

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Naturalized Meadow Plants List

City of Redmond Climate Resiliency and Sustainability Vegetation Management Plan

SPECIES		CHARACTERISTICS								BLOOM CHART						PLANTING AND MAINTENANCE			
BOTANICAL NAME	COMMON NAME	NATIVE/ NON-NATIVE	MATURE HEIGHT	MATURE WIDTH	WETLAND INDICATOR STATUS	SOIL/ MOISTURE	EXPOSURE	ANNUAL/ PERENNIAL EVERGREEN/ DECIDUOUS	POLLINATORS/ WILDLIFE	WINTER INTEREST	EARLY SPRING	LATE SPRING	SUMMER	EARLY FALL	LATE FALL	MAINTENANCE	CLIMATE RESILIENCE	DISEASE/ PESTS	NOTES
SHRUBS																			
Mahonia nervosa	Creeping Oregon grape	N	1' - 2'	1' - 2'	FACU	Moist, well-drained soil	Full sun to part shade	P / E	Attract a diversity of pollinating insects, birds eat berries		Yellow flowers					Moderate	Drought/heat tolerant	Deer tolerant, susceptible to rusts/spots and aphids	
Rosa nutkana	Nootka rose	N	4' - 8'	4' - 8'	FAC	Moist, well-drained	Full to part sun	P / D	Birds and insects, butterflies in particular; thickets for nesting and refuge	Fruits		Pink flowers				Low	Drought/heat tolerant		
Symphoricarpos albus	Western snowberry	N	3' - 6'	3' - 6'	FACU	Moist, well-drained soil	Full sun to part shade	P / D	Attract pollinating insects and birds	Fruits			Pink flowers			Low	Drought/heat tolerant, erosion tolerant	Anthracnose, leaf spot, powdery mildew, rust and berry rot may occur.	
GROUNDCOVERS																			
Achillea millefolium	Western yarrow	N	2' - 3'	2' - 3'	FACU	Moist to dry	Full sun	P / E	Butterflies and bees				White-yellow flowers			Moderate	Tolerant of drought and air pollution	Deer resistant. Stem rot, powdery mildew and rust are occasional disease problems	
Aquilegia formosa	Western columbine	N	1' - 3'	1'	FAC	Moist to dry, well-drained	Full sun to part shade	P / D	Hummingbirds			Orange-red flowers				Low		Leaf miner is a common pest	
Asclepias speciosa	Showy milkweed	N	1' - 3'	1' - 1.5'	FAC	Moist to dry	Full sun	P / D	Hummingbirds and butterflies			Pink flowers				Low	Drought tolerant	Deer resistant	
Camassia leichtlinii	Great camas	N	2' - 4'	6"	FACW	Moist to wet	Full sun to part shade	P / D	Insects		Purple-blue flowers (white)					Low	Tolerates clay soil, dry soil, wet soil, and black walnut		Self-seeding
Camassia quamash	Common camas	N	2'	2'	FACW	Moist to wet	Full sun to part shade	P / D	Insects		Purple-blue flowers (white)					Low	Tolerates clay soil, dry soil, wet soil, and black walnut		Self-seeding
Carex tumilicola	Foothill sedge	N	1' - 2'	1' - 2'	FACU	Moist to wet	Full to part shade	P / E	Birds							Low	Drought tolerant	Deer resistant. Occasional leaf spot, smut, and rust	
Clarkia amoena	Farewell to spring	N	1' - 2'	1' - 2'	NOT LISTED	Moist to dry	Full sun to part shade	P / D	Bees, butterflies, and other beneficial insects		Pink flowers					Low	Drought tolerant	Susceptible to powdery mildew, verticillium wilt, stem rot and leaf spot, as well as aphids, mites, and Japanese beetles	
Collomia grandiflora	Large-leaf collomia	N	1' - 3'	1' - 2'	NOT LISTED	Moist to dry	Sun to shade	P / D	Bees, butterflies, and other beneficial insects, hummingbirds			Yellow-orange flowers				Low	Drought tolerant		
Danthonia californica	California oatgrass	N	1' - 2'	1' - 1.5'	FAC	Moist	Full sun to part shade	P / E	Attract butterflies and their larvae							Low		Deer resistant	
Deschampsia elongata	Slender hair grass	N	2' - 3'	1' - 2'	FACW	Moist, slow draining soils	Full sun to full shade	P / E	Attract butterflies and their larvae							Low			
Eriophyllum lanatum	Oregon sunshine	N	1' - 3'	1' - 2'	NOT LISTED	Moist to dry, well-drained	Full sun to part shade	P / D	Birds and butterflies			Yellow flowers				Low	Drought tolerant	Ignored by deer	
Eschscolzia californica	California poppy	N	1' - 2'	1' - 1.5'	NOT LISTED	Moist to dry	Full sun	P / D	Attracts many insect pollinators		Orange flowers					Low	Drought/heat resistant, reduce erosion		
Festuca roemeri	Roemer's fescue	N	1' - 3'	1' - 2'	NOT LISTED	Moist to dry	Full sun to part shade	P / E	Seeds are food for wildlife and foliage is food for larval butterfly species							Low	Drought tolerant		
Fragaria chiloensis	Coastal strawberry	N	6" - 1'	2' - 3'	FACU	Moist to dry	Full sun to full shade	P / D	Bees and butterflies pollinate flowers, birds and mammals eat berries		White flowers					Low	Drought tolerant		

Gilia capitata	Blue field gilia	N	1' - 3'	1' - 2'	NOT LISTED	Dry, well-drained soil	Full sun	P / D	Attracts bees and butterflies, host plant for butterfly/moth larvae			Blue-violet flowers				Low			
Grindelia integrifolia	Puget Sound gumweed	N	2'	6"	FACW	Moist to wet, can tolerate clay/poor soils	Full to part sun	P / D	Nectar/pollen source for butterflies, bees, flies, wasps, and other beneficial insects				Yellow flowers			Low	Drought tolerant		
Juncus tenuis	Slender rush	N	2'	2'	FAC	Moist, prosper in heavy clay and gravelly soils	Full sun to part shade	P / E	Provides cover and nesting sites for wetland birds and other wildlife							Low	Tolerate drought, flooding, moderate salinity, compacted soils	Deer and pest resistant	
Potentilla gracilis	Slender cinquefoil	N	6" - 18"	1' - 2'	FAC	Moist	Full sun	P / D					Yellow flowers			Low	Drought tolerant	Tolerate deer	
Prunella vulgarissp. vulgaris	Self-heal	N	1'	6"	FACU	Moist, well-drained soil	Full sun to part shade	P / D	Host plant for butterfly species, nectar/pollen source for beneficial insects			Purple flowers				Low			
Ranunculus occidentalis	Western buttercup	N	6" - 18"	6" - 1'	FACW	Moist to wet, can tolerate clay/poor soils	Full sun to full shade	P / D	Attracts butterflies, host plant for moth larvae		Yellow flowers					Low			
Sidalcea malviflora	Rose checkermallow	N	2'	2'	FACW	Moist to wet	Full sun	P / D	Attract bees and butterflie, host plants for caterpillars of a few native butterfly species			Pink flowers				Low	Drought tolerant	Susceptible to leaf spot or rust if conditions are too wet	
Symphyotrichum subspicatum	Douglas aster	N	2'	2'	FACW	Moist, well-drained soil	Full sun to part shade	P / D	Attract bees, butterflies, and pollinating flies/wasps				Blue-purple flowers			Low			

Roadside Meadow Plants List

City of Redmond Climate Resiliency and Sustainability Vegetation Management Plan

SPECIES		CHARACTERISTICS								BLOOM CHART						PLANTING AND MAINTENANCE			
BOTANICAL NAME	COMMON NAME	NATIVE/ NON-NATIVE	MATURE HEIGHT	MATURE WIDTH	WETLAND INDICATOR STATUS	SOIL/ MOISTURE	EXPOSURE	ANNUAL/ PERENNIAL EVERGREEN/ DECIDUOUS	POLLINATORS/ WILDLIFE	WINTER INTEREST	EARLY SPRING	LATE SPRING	SUMMER	EARLY FALL	LATE FALL	MAINTENANCE	CLIMATE RESILIENCE	DISEASE/PESTS	NOTES
GROUNDCOVERS																			
Achillea millefolium	Western yarrow	N	2' - 3'	2' - 3'	FACU	Moist to dry	Full sun	P / E	Butterflies and bees				White-yellow flowers			Moderate	Deer resistant. Stem rot, powdery mildew and rust are occasional disease problems	Tolerant of drought and air pollution	
Agastache urticifolia	Nettle-leaf horsemint	NN	0.3-5'	1'	FACU	Moist to dry	Full sun	P / D	Attracts many insect pollinators				Pink flowers			Low	Drought/heat resistant, reduce erosion	Herbivory	
Asclepias speciosa	Showy milkweed	N	1' - 3'	1' - 1.5'	FAC	Moist to dry	Full sun	P / D	Hummingbirds and butterflies			Pink flowers				Low	Deer resistant	Drought tolerant	
Camassia quamash	Common camas	N	2'	2'	FACW	Moist to wet	Full sun to part shade	P / D	Insects		Purple-blue flowers (white)					Low	Tolerates clay soil, dry soil, wet soil, and black walnut		Self-seeding
Eschscholzia californica	California poppy	N	1' - 2'	1' - 1.5'	NOT LISTED	Moist to dry	Full sun	P / D	Attracts many insect pollinators		Orange flowers					Low		Drought/heat resistant, reduce erosion	
Geum macrophyllum	Largeleaf avens	N	1.5'	6"	FAC	Moist, well-drained soil	Full to part sun	P / D	Insect pollinators				Yellow flowers			Low			
Helianthus nuttallii	Nuttall's sunflower	NN	1.6-13.1'	1'	FACW	Moist	Full sun	A / P	Attracts many insect pollinators				Yellow flowers			Low	Drought/heat resistant, reduce erosion	Herbivory	
Lupinus albicaulis	Sickle keeled lupine	N	3' 4'	3'	FAC	Moist to wet	Full sun	P / D	Attracts many insect pollinators		White flowers					Low	Drought/heat resistant, reduce erosion	Herbivory	Plant low quantities due to rapid spread
Monardella odoratissima	Coyote mint	NN	4-11.8'	1'	FACU	Moist	Full sun	P / D	Attracts many insect pollinators				Purple flowers			Low	Drought/heat resistant, reduce erosion	Herbivory	
Penstemon speciosus	Royal penstemon	N	2-2.5'	2'	NOT LISTED	Dry	Full sun	P / D	Attracts many insect pollinators				Blue flowers			Low	Drought/heat resistant, reduce erosion		
Phacelia tanacetifolia	Lacy phacelia	N	2-4'	1.5'	NOT LISTED	Dry	Full sun	A	Attracts many insect pollinators		Purple flowers					Low	Drought/heat resistant, reduce erosion	Herbivory	
Prunella vulgaris ssp. *vulgaris*	Self-heal	N	1'	6"	FACW	Moist, well-drained soil	Full sun to part shade	P / D	Host plant for butterfly species, nectar/pollen source for beneficial insects			Purple flowers				Low			
Ranunculus occidentalis	Western buttercup	N	6" - 18"	6" - 1'	FACW	Moist to wet, can tolerate clay/poor soils	Full sun to full shade	P / D	Attracts butterflies, host plant for moth larvae		Yellow flowers					Low			
Sidalcea malviflora	Rose checkermallow	N	2'	2'	FACW	Moist to wet	Full sun	P / D	Attract bees and butterflies, host plants for caterpillars of a few native butterfly species			Pink flowers				Low	Drought tolerant	Susceptible to leaf spot or rust if conditions are too wet	
Solidago canadensis	Canada goldenrod	N	5'	1'	FACU	Dry	Full sun	P / D	Attracts many insect pollinators					Yellow flowers		Low	Drought/heat resistant, reduce erosion	Herbivory	
Symphyotrichum subspicatum	Douglas aster	N	2'	2'	FACW	Moist, well-drained soil	Full sun to part shade	P / D	Attract bees, butterflies, and pollinating flies/wasps				Blue-purple flowers			Low			

Pollinator Garden Plants List

City of Redmond Climate Resiliency and Sustainability Vegetation Management Plan

SPECIES		CHARACTERISTICS								BLOOM CHART						PLANTING AND MAINTENANCE			
BOTANICAL NAME	COMMON NAME	NATIVE/ NON-NATIVE	MATURE HEIGHT	MATURE WIDTH	WETLAND INDICATOR STATUS	SOIL/ MOISTURE	EXPOSURE	ANNUAL/ PERENNIAL EVERGREEN/ DECIDUOUS	POLLINATORS/ WILDLIFE	WINTER INTEREST	EARLY SPRING	LATE SPRING	SUMMER	EARLY FALL	LATE FALL	MAINTENANCE	CLIMATE RESILIENCE	DISEASE/PESTS	NOTES
TREES																			
Prunus cerasifera	Cherry plum	NN	15' - 30'	15' - 25'	NOT LISTED	Moist, well-drained	Full sun to part shade	P / D	Birds and insects, butterflies in particular; thickets for nesting and refuge		Pink flowers					Moderate		Susceptible to black knot, leaf spot, die back, leaf curl, powdery mildew, root rot and fireblight. Potential for insect pests.	
SHRUBS																			
Arctostaphylos uva-ursi	Kinnikinnick	N	6" - 1'	3' - 6'	FACU	Moist to dry, prefers rocky/sandy acidic soils	Full sun to full shade	P / E	Birds, butterflies, hummingbirds, larval host plant		White-pink flowers					Low	Cold and heat tolerant, drought tolerant		
Ceanothus thyrsiflorus	Blueblossom	NN	6' - 10'	6' - 10'	NOT LISTED	Moist to dry, well-drained	Part shade	P / E	Insects, especially bees and butterflies, are attracted to flowers. Host plants for butterfly and moth species larvae		Blue flowers					Low	Drought tolerant		
Mahonia aquifolium	Tall Oregon grape	N	3' - 6'	3' - 5'	FACU	Moist to dry, well-drained	Part to full shade	P / E	Birds eat berries, bees and butterflies pollinate flowers		Yellow flowers					Low	Fire-resistant	Deer resistant	
Philadelphus lewisii	Mock orange	N	6' - 10'	6' - 8'	NOT LISTED	Moist to dry	Full to part sun	P / D	Birds, insects, mammals			White flowers				Low	Drought tolerant		
Ribes sanguineum	Red flowering currant	N	3' - 10'	3' - 10'	FACU	Moist, well-drained	Full to part sun	P / D	Birds, butterflies, hummingbirds, bees		Pink flowers					Low	Drought tolerant	Deer tolerant	
Rosa nutkana	Nootka rose	N	4' - 8'	4' - 8'	FAC	Moist, well-drained	Full to part sun	P / D	Birds and insects, butterflies in particular; thickets for nesting and refuge	Fruits		Pink flowers				Low	Drought/heat tolerant		
Vaccinium corymbosum	Blueberry	NN	5' - 8'	4' - 6'	FACW	Moist to wet,	Full sun to part shade	P / D	Birds and butterflies			White-pink flowers				Low		Chlorosis, stem blight, root rot, anthracnose, cane cankers, mildew, and botrytis. Maggots, fruit worm, and fly can attack fruit.	
Vaccinium ovatum	Evergreen huckleberry	N	3' - 6'	3' - 6'	FACU	Moist to dry, well-drained	Full sun to full shade	P / E	Birds, butterflies, mammals; host plant to butterfly/moth larvae			White-pink flowers				Low	Drought tolerant		
GROUNDCOVERS																			
Achillea millefolium	Western yarrow	N	2' - 3'	2' - 3'	FACU	Moist to dry	Full sun	P / E	Butterflies and bees				White-yellow flowers			Moderate	Tolerant of drought and air pollution	Deer resistant. Stem rot, powdery mildew and rust are occasional disease problems	
Aquilegia formosa	Western columbine	N	1' - 3'	1'	FAC	Moist to dry, well-drained	Full sun to part shade	P / D	Hummingbirds			Orange-red flowers				Low		Leaf miner is a common pest	
Campanula rotundifolia	Common harebell	NN	8" - 2'	6" - 1'	FACU	Moist, well-drained	Full sun to part shade	P / D	Bees, butterflies, moths, wasps, and beetles; birds				Blue flowers			Low		Deer tolerant	
Echinacea purpurea	Coneflower	NN	2' - 5'	1.5' - 2'	NOT LISTED	Moist to dry, well-drained	Full sun	P / D	Attracts birds, butterflies, bees, and other beneficial insects				Pink flowers			Low	Drought tolerant		
Fragaria chiloensis	Coastal strawberry	N	6" - 1'	2' - 3'	FACU	Moist to dry	Full sun to full shade	P / D	Bees and butterflies pollinate flowers, birds and mammals eat berries		White flowers					Low	Drought tolerant		

Iris tenax	Oregon iris	N	1.5'	0.25"	NOT LISTED	Moist to dry, well-drained	Full sun to part shade	P / D	Attract butterflies, host plant for moth species		White-purple flowers					Low	Drought tolerant		
Lavandula angustifolia	Lavender	NN	1' - 3'	1' - 3'	NOT LISTED	Moist to dry, well-drained	Full sun	P / D	Attracts birds, butterflies, bees, and other beneficial insects			Purple flowers				Low		Potential for root rot	
Monarda didyma	Bee balm	NN	2' - 4'	2' - 3'	FAC	Moist, well-drained	Full sun to part shade	P / D	Bees, butterflies, and hummingbirds.				Red flowers			Low		Deer and rabbit resistant	
Nepeta cataria	Catmint	NN	1' - 2'	1.5' - 2'	FACU	Moist, well-drained	Full sun to part shade	P / D	Attracts birds, butterflies, bees, and other beneficial insects			Purple flowers				Low	Drought tolerant	Resistant to phytophthora. Susceptible to root rot	
Perovskia atriplicifolia	Russian sage	NN	3' - 5'	2' - 4'	NOT LISTED	Moist to dry, well-drained	Full sun	P / D	Attracts bees, butterflies, and other beneficial insects				Purple-blue flowers			Low	Drought tolerant		
Rudbeckia hirta	Black-eyed susan	NN	2' - 3'	1' - 2'	FACU	Moist, well-drained	Full sun	P / D	Attracts birds, butterflies, bees, and other beneficial insects				Yellow flowers			Low		Slugs, powdery mildew	
Salvia nermorosa	Woodland sage	NN	1.5' - 2'	1.5' - 2'	NOT LISTED	Moist to dry, well-drained	Full sun	P / D	Attracts birds, butterflies, bees, and other beneficial insects			Purple flowers				Low	Tolerate drought and air pollution	Powdery mildew where soil is dry and air humid, herbivory	
Sedum spectabile 'autumn joy'	Stonecrop	NN	1.5' - 2'	1.5' - 2'	NOT LISTED	Moist to dry, well-drained	Full sun to part shade	P / D	Attracts butterflies and bees				White-pink flowers			Low			
Sidalcea malviflora	Rose checkermallow	N	2'	2'	FACW	Moist to wet	Full sun	P / D	Attract bees and butterflies, host plants for caterpillars of a few native butterfly species			Pink flowers				Low	Drought tolerant	Susceptible to leaf spot or rust if conditions are too wet	
Thymus praecox 'minus'	Creeping thyme	NN	2" - 4"	1' - 1.5'	NOT LISTED	Moist to dry, well-drained	Full sun	P / E	Attracts butterflies and bees				Purple flowers			Low	Drought tolerant		

Wetland Plants List

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BOTANICAL NAME	COMMON NAME	NATIVE/ NON-NATIVE	MATURE HEIGHT	MATURE WIDTH	WETLAND INDICATOR STATUS	SOIL/ MOISTURE	EXPOSURE	ANNUAL/ PERENNIAL EVERGREEN/ DECIDUOUS	POLLINATORS/ WILDLIFE	WINTER INTEREST	EARLY SPRING	LATE SPRING	SUMMER	EARLY FALL	LATE FALL	MAINTENANCE	CLIMATE RESILIENCE	DISEASE/PESTS	NOTES
TREES																			
Acer circinatum	Vine maple	N	15' - 25'	15'-20'	FAC	Tolerant of a variety of soils, prefers fertile, moist, acidic soil.	Part Sun - Shade	P / D	Supports bees and butterflies		Yellow-green leaves			Red leaves		Low	Tolerant of varying moisture conditions.	Oak galls, hairy mistletoe, shoestring root rot, armillaria, butt rot, white pocket rot	Does well as a dominant understory species.
Alnus rubra	Red alder	N	40' - 80'	20' - 40'	FAC	Prefers moist, rich soils, well-drained gravels and sands, and poorly drained clay and organic soils. Likes wet winters and dry summers.	Sun - Shade	P / D	Deer/elk browse twigs, birds eat seeds, cover/habitat	Catkins	Red-burgundy flowers			Brown-yellow leaves		Low	Drought, humidity, poor/wet soil resistant	Cedar-hawthorn rust, cedar-quince rust, fireblight, fungal leaf spots, powdery mildew, cankers and apple scab are occasional problems. Insect pests include borers, caterpillars, lacebugs, leafminers and scale. Falling fruit can create clean-up problems in fall.	Host to nitrogen-fixing bacteria, crucial species for habitat restoration. Supports wildlife.
Betula papyrifera	Paper birch	N	50'-70'	25'-50'	FAC	Prefers moist, well-drained, acidic soil. Tolerant of a variety of soils, including sandy and rocky soils. Doesn't tolerate drought, compacted soils.	Part Sun - Shade	P / D	Birds, pollinators, small mammals	Catkins, Bark	Yellow-brown catkins			Yellow leaves		Moderate	Does not tolerate heat or drought. Pioneer species in cooler areas. Pioneer species for wildfire, avalanche or windthrow areas.	Bronze birch borer, leaf miner, aphids, birch dieback	Not well suited for every restoration site. Use in limited quantities.
Crataegus douglasii	Black hawthorn	N	15' - 30'	15' - 25'	FAC	Moist, deep, fine-textured soils. Can tolerate streamside conditions, gravels, clays and rocky soils.	Sun - Part Shade	P / D	Birds, butterflies			White flowers		Red-purple leaves		Moderate	Drought, erosion, and air pollution tolerant	Cedar-hawthorn rust, cedar-quince rust, fireblight, fungal leaf spots, powdery mildew, cankers and apple scab are occasional problems. Insect pests include borers, caterpillars, lacebugs, leafminers and scale. Falling fruit can create clean-up problems in fall.	Thorns. Will form thickets in sunnier, wetter locations.
Frangula purshiana	Cascara	N	20'-40'	10'-30'	FAC	Moist, well-drained, rich in organic matter soil. Tolerant of a variety of pH.	Part Sun - Shade	P / D	Supports birds and insects		White-green flowers		Fruits	Orange-yellow leaves		Low	Drought tolerant, especially in shade. Cold tolerant.	Few problems. Aphids, crown rust.	Berries attract birds and wildlife.
Fraxinus latifolia	Oregon ash	N	60'-80'	30'-40'	FACW	Prefers poorly drained, moist bottom lands, rich soil, deep organic matter. Can tolerate rocky, sandy and clay soils.	Full Sun - Light Shade	P / D	Insects , birds, small mammals, large mammals		Yellow-green flowers			Yellow leaves		Moderate	Does well in disturbed sites, and a variety of soils. Emerald ash borer (EAB) infestation will decimate many populations eventually.	Emerald ash borer. A variety of fungi cause leaf spot and powdery mildew. A heart rot can cause an extensive defect in older trees.	Recommend planting in isolated areas or to help retain native ash population when EAB hits. Plant sporadically and not as a monoculture in restoration.
Malus fusca	Pacific crabapple	N	15' - 30'	15' - 25'	FACW	Does well in a variety of soils, can tolerate salt water, heavy clay soils, poorly drained soils, and well-drained soil.	Full Sun - Light Shade	P / D	Birds, bees		White-pink flowers		Fruits	Red-orange leaves		Low	Wet tolerant, and drought tolerant once established.	Susceptible to honey fungus.	Will form thickets in sunnier, wetter locations.
Picea sitchensis	Sitka spruce	N	100' - 200'	20' - 30'	FAC	Rich, well-drained, acidic, consistently moist, adaptable once established. Tolerates high acidity. Likes moist to wet sandy soils.	Sun - Part Shade	P / E	Valuable food source and nesting and roosting site for many birds and small mammals	Needles						Moderate	Not drought tolerant for extended periods.	Susceptible to the green spruce aphid, white pine weevil, ambrosia beetle, spruce beetles, scales, adelgids, and spider mites. Galls are caused by the Cooley spruce gall adelgid and are frequently seen. Other potential	Not well suited for every restoration site. Use in limited quantities unless in coastal locations well suited to them, then they can be planted as a dominant species.

																		problems include fungal diseases resulting in root and stem rots	
Pinus contorta ssp contorta	Shore pine	N	45'-65'	10' - 15'	FAC	Tolerates a wide variety of soil conditions, including sandy and poorly drained.	Sun - Part Shade	P / E	Birds, butterflies, moths	Needles						Moderate	Drought tolerant and salt spray tolerant.	Pitch moth, silverspotted tiger moth, pine shoot moth, pine sheath miners, coneworms	Does well in urban locations and riparian restoration areas. Can be planted as the dominant species and will self-sow freely. Plant in palustrine forested (PEM) wetland and sparingly in scrub-shrub wetland (PSS) habitats.
Populus balsamifera ssp. trichocarpa	Black cottonwood	N	70'-100'+	30' - 50'	FAC	Moist to wet soils. Tolerate poor and dry soils, sandy soils, bottomlands, riverbanks. Does not tolerate dry soils for extended time.	Sun	P / D	Birds, butterflies, moths		White cotton seed dispersion			Brown-yellow leaves		Low	Wet and flood tolerant. Moderately drought tolerant once established.	Poplar borer, aphids, leaf beetles, gall mite, poplar rust, blight, canker, stem decay, fungal diseases	Does well in urban locations and riparian restoration areas. Can be planted as the dominant species and will self-sow freely. Plant in palustrine forested (PEM) wetland and sparingly in scrub-shrub wetland (PSS) habitats.
Salix hookeriana	Dune willow	N	6' - 20'	6' - 20'	FACW	Moist to wet soils. Can be planted at the edge of standing freshwater. Likes a variety of soil types and pH, as long as it is moist or wet.	Full sun to part shade	P / D	Earliest food source for bees, birds, small mammals, large mammals	Sulfur yellow buds	Yellow-green flowers			Yellow leaves		Low	Tolerates disturbed wet areas and poor, flooded soils.	Aphids, scale, borers. May be susceptible to anthracnose, scab, canker, honey fungus, and rust	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix lucida ssp. Lasiandra	Pacific willow	N	6' - 20'	6' - 20'	FACW	Likes heavy soils, clay soils, alluvial soils, sandy soils, loamy, acidic soils.	Full sun to part shade	P / D	Earliest food source for bees, birds, small mammals, large mammals		Yellow-green flowers			Yellow leaves		Low	Adaptable, intolerant of drought. Responds well to herbivory and fire	Aphids, scale, borers. May be susceptible to anthracnose, scab, canker, honey fungus, and rust	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix prolixa	Mackenzies willow	N	12'-30'	15'-20'	OBL	Prefers sandy, wet soils. Tolerates other fine textured soils and moderate to high amounts of water.	Full sun to part shade	P / D	Butterflies, bees, and caterpillars		White-yellow flowers			Yellow leaves		Low	Moderately tolerant of drought. Tolerant of flooding and soil saturation.	Brown spot, leaf beetles, leaf rot, leaf miners	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix scouleriana	Scouler's willow	N	10' - 25'	10' - 25'	FAC	Can tolerate low, moderate, and high moisture, and is adaptable and tolerant of sand, loam, and clay.	Full sun to shade	P / D	Earliest food source for bees, birds, small mammals, large mammals		Yellow flowers			Yellow leaves		Low	Adaptable, intolerant of drought.	Canker, borer, blight	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Salix sitchensis	Sitka willow	N	3' - 15'	3' - 15'	FACW	Prefers heavy, wet soils, moist soils, tolerant of flooding and soil saturation, acidic soil.	Part shade	P / D	Earliest food source for bees, birds, small mammals, large mammals		Yellow-green flowers			Yellow leaves		Low	Adaptable, intolerant of drought.	Aphids, scale, borers. May be susceptible to anthracnose, scab, canker, honey fungus, and rust	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
Thuja plicata	Western redcedar	N	50' - 200'	20' - 30'	FAC	Moist, fertile, well-drained soils.	Part to full shade	P / E	Caterpillar host plant/larval food source, large mammals, butterflies, moths, birds	Scales						Moderate	Not resilient to heat and drought. Tolerates seasonal flooding.	No serious insect or disease problems. Bagworm and rots may occur.	Not as climate adaptable as other species. Avoid planting as a dominant canopy tree until restoration site is better established and soil is moist.
SHRUBS																			
Cornus alba	Redosier dogwood	N	6' - 9'	6' - 9'	FACW	Moist, well-drained	Sun to shade	P / D	Birds and butterflies. Waterfowl, marsh birds and shorebirds are major users. Also	Stems		White flowers				Low	Adaptable to a wide range of soil and climatic conditions	Plagued by twig blight, scale and bagworms	

									large and small mammals. Deer browse on dogwood year-round.									
Oemleria cerasiformis	Osoberry	N	6' - 20'	6' - 15'	FACU	Moist, well-drained	Full to part sun	P / D	Bees, birds, butterflies		White flowers				Low	Fire-resistant		
Oplopanax horridus	Devil's club	N	6' - 15'	6' - 8'	FAC	Moist, well-drained, prefers acidic soils	Part to full shade	P / D	Bees and other insects			White flowers			Low			
Physocarpus capitatus	Pacific ninebark	N	5' - 10'	5' - 8'	FACW	Moist, well-drained, prefers acidic soils	Full to part sun	P / D	Butterflies			White flowers	Red-brown leaves		Low	Drought tolerant	Deer resistant	
Ribes bracteosum	Stink currant	N	3' - 5'	3' - 6'	FAC	Moist to wet	Sun to part shade	P / D	Birds			White-green flowers			Moderate		Occasional aphids/rust	
Ribes lacustre	Prickly currant	N	3' - 6'	3' - 6'	FAC	Moist, well-drained	Sun to shade	P / D	Birds and insects			Maroon flowers			Low		Occasional aphids/rust	
Rosa nutkana	Nootka rose	N	4' - 8'	4' - 8'	FAC	Moist, well-drained	Full to part sun	P / D	Birds and insects, butterflies in particular; thickets for nesting and refuge	Fruits		Pink flowers			Low	Drought/heat tolerant		
Rosa pisocarpa	Clustered rose	N	3' - 6'	3' - 6'	FAC	Moist, well-drained	Full to part sun	P / D	Birds and insects, butterflies in particular; thickets for nesting and refuge	Fruits		Pink flowers			Low	Drought/heat tolerant		
Rubus spectabilis	Western salmonberry	N	3' - 10'	3' - 10'	FAC	Moist to dry	Full shade to full sun	P / D	Food and shelter for pollinators, insects, birds, and mammals			Pink flowers			Low		Susceptible to mildew, fruit rot, rust, root rot, and viral and bacterial diseases. Fruits, foliage, canes, roots, and crowns may be damaged by beetles, aphids, mites, moths, etc.	
Sambucus nigra ssp. caerulea	Blue elderberry	N	15' - 30'	8' -20'	FAC	Moist to wet, well-drained	Full sun to part shade	P / D	Food for insects, birds, and mammals, attracts butterflies and bees			white flowers	Fruits		Moderate	Some drought tolerance	Canker, powdery mildew, leaf spot, borers, spider mites, and aphids. Deer resistant	
Spiraea douglasii	Hardhack	N	2' - 6'	2' - 6'	FACW	Moist to wet	Full sun to part shade	P / D	Pollinated by insects, browsed by deer, cover for waterbirds				Pink flowers	Fruits	Low			
GROUNDCOVERS																		
Camassia leichtlinii	Great camas	N	2' - 4'	6"	FACW	Moist to wet	Full sun to part shade	P / D	Insects		Purple-blue flowers (white)				Low	Tolerates clay soil, dry soil, wet soil, and black walnut		Self-seeding
Camassia quamash	Common camas	N	2'	2'	FACW	Moist to wet	Full sun to part shade	P / D	Insects		Purple-blue flowers (white)				Low	Tolerates clay soil, dry soil, wet soil, and black walnut		Self-seeding
Carex deweyana	Dewey sedge	N	2'	3'	FAC	Moist	Sun to shade	P / E							Low	Tolerates drier conditions that most sedges		
Carex lenticularis	Shore sedge	N	4'	3'	OBL	Moist to wet, prefers sandy/loamy soil	Full sun to part shade	P / E	Birds eat seeds, birds/mammals use as cover/nesting						Low			
Carex obnupta	Slough sedge	N	3'	2'	OBL	Moist to wet	Sun to part shade	P / E	Provides food and shelter for waterfowl						Low			
Carex pachystachya	Thick headed sedge	N	3'	2'	FAC	Moist to dry	Sun to part shade	P / E							Low	Can thrive in drier conditions than most sedges		
Carex stipata	Awl-fruit sedge	N	3'	2'	OBL	Wet, clay/loam/sand	Full sun to part shade	P / E							Low		Deer resistant	
Deschampsia cespitosa	Tufted hair grass	N	2'	2'	FACW	Moist to wet, clay/loam/sand	Full sun to part shade	P / E	Larval food plant for several butterfly species						Low		Deer resistant	

Eleocharis palustris	Common spikerush	N	3'	2'	OBL	Wet	Full sun to part shade	P / E								Low		Potential for aphids	
Festuca rubra	Red fescue	N	2'	2'	FAC	Moist to dry, can tolerate sandy/acidic soils	Part shade to full sun	P / E	Butterflies/moth, caterpillars							Low	Hardy, wear-resistant, drought tolerant	Deer resistant	
Geum macrophyllum	Largeleaf avens	N	1.5'	6"	FAC	Moist, well-drained soil	Full to part sun	P / D	Insect pollinators				Yellow flowers			Low			
Glyceria elata	Tall mannagrass	N	4'	2'	FACW	Moist to wet	Full sun to part shade	P / E	Host plant for many moth species							Low			
Glyceria grandis	American mannagrass	N	3'	2'	OBL	Moist to wet	Full sun	P / E								Low		Deer resistant	
Grindelia integrifolia	Puget Sound gumweed	N	2'	6"	FACW	Moist to wet, can tolerate clay/poor soils	Full to part sun	P / D	Nectar/pollen source for butterflies, bees, flies, wasps, and other beneficial insects				Yellow flowers			Low			
Hordeum brachyantherum	Meadow barley	N	3'	2'	FACW	Moist to wet	Full sun	P / E	Butterflies and moths, adult and larval stage							Low		May be susceptable to fungal diseases, (head smut and leaf/stem rust), deer resistant	
Juncus balticus	Baltic rush	N	2'	2'	FACW	Moist to wet	Full sun to part shade	P / E								Low		Butterflies and moths, adult and larval stage, deer resistant	
Juncus ensifolius	Daggerleaf rush	N	1.5'	2'	FACW	Moist to wet	Full sun to part shade	P / E	Beneficial insects, larval food source							Low			
Juncus patens	Spreading rush	N	2'	2'	FACW	Moist to wet	Full sun	P / E	Host plant for many moth species							Low		Deer resistant	
Juncus tenuis	Slender rush	N	2'	2'	FAC	Moist, prosper in heavy clay and gravelly soils	Full sun to part shade	P / E	Provides cover and nesting sites for wetland birds and other wildlife							Low	Tolerate drought, flooding, moderate salinity, compacted soils	Deer and pest resistant	
Schoenoplectus acutus	Hardstem bulrush	N	5'	3'	OBL	Wet to standing water	Full sun	P / E	Provides food, cover, and nesting habitat for waterfowl and other birds							Low	Withstands alkalinity	Deer resistant	Valuable for providing shoreline protection
Schoenoplectus americanus	Three-square bulrush	N	7'	3'	OBL	Wet to standing water	Full sun	P / E	Provides food, cover, and nesting habitat for birds and small mammals. Host plant of multiple moth species							Low			
Scirpus microcarpus	Small fruited bullrush	N	5'	3'	OBL	Wet to standing water	Full sun to part shade	P / E	Used by birds and mammals for food and nesting material							Low			
Sidalcea malviflora	Rose checkermallow	N	2'	2'	FACW	Moist to wet	Full sun	P / D	Attract bees and butterflie, host plants for caterpillars of a few native butterfly species			Pink flowers				Low	Susceptible to leaf spot or rust if conditions are too wet	Drought tolerant	
Symphyotrichum subspicatum	Douglas aster	N	2'	2'	FACW	Moist, well-drained soil	Full sun to part shade	P / D	Attract bees, butterflies, and pollinating flies/wasps				Blue-purple flowers			Low			
Urtica dioica	Stinging nettle	N	6'	2'	FAC	Moist	Full sun to part shade	P / D	Attracts bees, butterflies, and other insect pollinators, hummingbirds, caterpillar host plant			Yellow-green flowers				Low			Burning/itching sensation lasting a few minutes from hairs on leaves/stems. Keep away from trails.

Understory Plants List

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TREES																			
Acer circinatum	Vine maple	N	15' - 20'	15'	FAC	Tolerant of a variety of soils, prefers fertile, moist, acidic soil.	Part Sun - Shade	P / D	Supports bees and butterflies					Red leaves		Low	Tolerant of dry summers once established. Important understory species in moist forests.	Verticillium wilt, Japanese beetle	Does well as a dominant understory species.
Amelanchier alnifolia	Saskatoon serviceberry	N	6' - 15'	4' - 8'	FACU	Moist to dry, well-drained	Sun Or Shade	P / D	Berries provide food for mammals and birds, dense growth provides shelter. Attracts bees and butterflies, host plant for larvae			White flowers		Red-orange leaves		Low	Moderately drought tolerant once established.	Rusts, fireblight, powdery mildew, and Entomosporium leaf, and insects such as elm aphid, saskatoon, sawfly, mites and leaf rollers.	Can be thicket forming. Supports wildlife.
Cornus nuttallii	Pacific dogwood	N	15'-40'	10'-25'	FACU	Moist, well-drained, slightly acidic soil, gentle slopes. Cool, rich and deep soils.	Part Sun - Shade	P / D	Bees, butterflies, birds, small mammals, large mammals			White flowers		Red-orange leaves		Moderate	Tolerant of seasonal flooding, intolerant of rapid changes in soil temperature.	Dogwood borer, other borers, scale, armillaria root rot, spider mites, crown canker, anthracnose	Not well suited for every restoration site. Use in limited quantities.
Corylus cornuta	Beaked hazelnut	N	8' - 20'	8' - 15'	FACU	Moist, well-drained, slightly acidic soil, organically rich soil.	Sun - Part Shade	P / D	Insects , birds, small mammals, large mammals					Orange-yellow leaves		Moderate	Drought resistant.	Armillaria root rot, blight, canker, leaf spot, powdery mildew	Form will be less dense and more spindly in forest understory and more bushy and dense in full sun.
Crataegus douglasii	Black hawthorn	N	15' - 30'	15' - 25'	FAC	Moist, deep, fine-textured soils. Can tolerate streamside conditions, gravels, clays and rocky soils.	Sun - Part Shade	P / D	Birds, butterflies			White flowers		Red-Purple		Moderate	Drought, erosion, and air pollution tolerant	Cedar-hawthorn rust, cedar-quince rust, fireblight, fungal leaf spots, powdery mildew, cankers and apple scab are occasional problems. Insect pests include borers, caterpillars, lacebugs, leafminers and scale. Falling fruit can create clean-up problems in fall.	Thorns. Will form thickets in sunnier, wetter locations.
Frangula purshiana	Cascara	N	20'-40'	10'-30'	FAC	Moist, well-drained, rich in organic matter soil. Tolerant of a variety of pH.	Part Sun - Shade	P / D	Supports birds and insects		White-green flowers		Fruits	Orange-yellow leaves		Low	Drought tolerant, especially in shade. Cold tolerant. Low maintenance.	Few problems: aphids, crown rust	Berries attract birds and wildlife.
Salix scouleriana	Scouler's willow	N	10' - 25'	10' - 25'	FAC	Can tolerate low, moderate, and high moisture, and is adaptable and tolerant of sand, loam, and clay.	Full Sun To Light Shade	P / D	Earliest food source for bees, birds, small mammals, large mammals		Yellow flowers			Yellow leaves		Low	Adaptable, intolerant of drought.	Black canker, willow blight, powdery mildew, bagworm moth, anthracnose	Plant in riparian or wetland habitats. Can be a dominant species in scrub-shrub (PSS) or palustrine forested (PEM) wetland habitats.
SHRUBS																			
Cornus alba	Redosier dogwood	N	6' - 9'	6' - 9'	FACW	Moist, well-drained	Sun to shade	P / D	Birds and butterflies. Waterfowl, marsh birds and shorebirds are major users. Also large and small mammals. Deer browse on dogwood year-round.	Stems		White flowers				Low	Adaptable to a wide range of soil and climatic conditions	Plagued by twig blight, scale and bagworms	
Gaultheria shallon	Salal	N	2' - 4'	2' - 6'	FACU	Moist to dry, prefer peaty soil	Part sun to full shade	P / E	Deer and birds browse on new leaves and berries. Flowers attracts butterflies and hummingbirds. Host plant of butterfly larvae	Leaves		White-pink flowers				Low			

Holodiscus discolor	Oceanspray	N	6' - 12'	6' - 12'	FACU	Dry to moist	Part shade	P / D	Birds and butterflies. Waterfowl, marsh birds and shorebirds are major users. Also large and small mammals. Deer browse on dogwood year-round.			White flowers			Low	Drought tolerant, fire-resistant	Fungal leaf spot and fire blight have been reported, but are not prevalent.	
Lonicera involucrata	Twinberry honeysuckle	N	3' - 10'	3' - 6'	FAC	Moist to wet	Full sun to full shade	P / D	Attracts hummingbirds and other wildlife; butterflies and bees, larval host plant			Yellow flowers			Low	Tolerates air pollution		
Mahonia aquifolium	Tall Oregon grape	N	3' - 6'	3' - 5'	FACU	Moist to dry, well-drained	Part to full shade	P / E	Birds eat berries, bees and butterflies pollinate flowers		Yellow flowers				Low	Fire-resistant	Deer resistant	
Mahonia nervosa	Dull Oregon grape	N	1' - 2'	1' - 2'	FACU	Moist, well-drained soil	Full sun to part shade	P / E	Attract a diversity of pollinating insects, birds eat berries		Yellow flowers				Moderate	Drought/heat tolerant	Deer tolerant, susceptible to rusts/spots and aphids	
Oemleria cerasiformis	Osoberry	N	6' - 20'	6' - 15'	FACU	Moist, well-drained	Full to part sun	P / D	Bees, birds, butterflies		White flowers				Low	Fire-resistant		
Philadelphus lewisii	Mock orange	N	6' - 10'	6' - 8'	NOT LISTED	Moist to dry	Full to part sun	P / D	Birds, insects, mammals			White flowers			Low	Drought tolerant		
Physocarpus capitatus	Pacific ninebark	N	5' - 10'	5' - 8'	FACW	Moist, well-drained, prefers acidic soils	Full to part sun	P / D	Butterflies			White flowers	Red-brown leaves		Low	Drought tolerant	Deer resistant	
Ribes sanguineum	Red flowering currant	N	3' - 10'	3' - 10'	FACU	Moist, well-drained	Full to part sun	P / D	Birds, butterflies, hummingbirds, bees		Pink flowers				Low	Drought tolerant	Deer tolerant	
Rosa nutkana	Nootka rose	N	4' - 8'	4' - 8'	FAC	Moist, well-drained	Full to part sun	P / D	Birds and insects, butterflies in particular; thickets for nesting and refuge	Fruits		Pink flowers			Low	Drought/heat tolerant		
Rubus parviflorus	Thimbleberry	N	3' - 6'	3' - 6'	FACU	Moist to dry	Full sun to full shade	P / D	Insects, birds, mammals for food and shelter			White flowers			Low		Leaf beetles, brown spot, leaf rot	
Rubus spectabilis	Western salmonberry	N	3' - 10'	3' - 10'	FAC	Moist to dry	Full shade to full sun	P / D	Food and shelter for pollinators, insects, birds, and mammals			Pink flowers			Low		Susceptible to mildew, fruit rot, rust, root rot, and viral and bacterial diseases. Fruits, foliage, canes, roots, and crowns may be damaged by beetles, aphids, mites, moths, etc.	
Sambucus racemosa	Red elderberry	N	8' - 12'	8' -15'	FACU	Moist to dry, tolerate wet	Full sun to part shade	P / D	Birds, butterflies			White flowers	Fruits		Moderate		Canker, powdery mildew, leaf spot, borers, spider mites, and aphids. Deer resistant	
Sambucus nigra ssp. caerulea	Blue elderberry	N	15' - 30'	8' -20'	FAC	Moist to wet, well-drained	Full sun to part shade	P / D	Food for insects, birds, and mammals, attracts butterflies and bees			White flowers	Fruits		Moderate	Some drought tolerance	Canker, powdery mildew, leaf spot, borers, spider mites, and aphids. Deer resistant	
Symphoricarpos albus	Western snowberry	N	3' - 6'	3' - 6'	FACU	Moist, well-drained soil	Full sun to part shade	P / D	Attract a pollinating insects and birds	Fruits			Pink flowers		Low	Drought/heat tolerant, erosion tolerant	Anthracnose, leaf spot, powdery mildew, rust and berry rot may occur.	
Vaccinium ovatum	Evergreen huckleberry	N	3' - 6'	3' - 6'	FACU	Moist to dry, well-drained	Full sun to full shade	P / E	Birds, butterflies, mammals; host plant to butterly/moth larvae	Leaves		White-pink flowers			Low	Drought tolerant		
Vaccinium parvifolium	Red huckleberry	N	3' - 6'	3' - 6'	FACU	Moist to dry, well-drained	Full to part shade	P / D	Attract butterflies and moths and host their larvae, bees. Birds and other mammals forage fruit and foliage			White-pink flowers			Low		Sometime prone to root weevil	
GROUNDCOVERS																			
Achillea millefolium	Western yarrow	N	2' - 3'	2' - 3'	FACU	Moist to dry	Full sun	P / E	Butterflies and bees				White-yellow flowers		Moderate	Tolerant of drought and air pollution	Deer resistant. Stem rot, powdery mildew and rust are occasional disease problems	
Achlys triphylla	Vanilla leaf	N	6" - 1'	1'	NOT LISTED	Moist, rich soils	Part to full shade	P / D	Attract butterflies/moths and host their larvae			White flowers			Low			
Aquilegia formosa	Western columbine	N	1' - 3'	1'	FAC	Moist to dry, well-drained	Full sun to part shade	P / D	Hummingbirds			Orange-red flowers			Low		Leaf miner is a common pest	
Arctostaphylos uva-ursi	Kinnikinnick	N	6" - 1'	3' - 6'	FACU	Moist to dry, prefers rocky/sandy acidic soils	Full sun to full shade	P / E	Birds, butterflies, hummingbirds, larval host plant		White-pink flowers				Low	Cold and heat tolerant, drought tolerant		
Asarum caudatum	Wild ginger	N	6" - 1'	1'	FACU	Moist to wet, prefer humusy/slightly acidic soils	Part to full shade	P / E	Pollinated by ants and beetles			Burgundy flowers			Low		Tolerate deer, slugs and snails, rust	
Athyrium filix-femina	Lady fern	N	1' - 3'	2'	NOT LISTED	Moist to wet, well-drained	Part to full shade	P / D							Low			
Dicentra formosa	Pacific bleeding heart	N	1' - 1.5'	1.5' - 2'	FACU	Moist, well-drained, humus-rich soil	Full sun to full shade	P / D	Attracts hummingbirds and butterflies, host plant of butterfly larvae		White-pink flowers				Low	Drought tolerant, fire resistant	Deer resistant	

Fragaria chiloensis	Coastal strawberry	N	6" - 1'	2' - 3'	FACU	Moist to dry	Full sun to full shade	P / D	Bees and butterflies pollinate flowers, birds and mammals eat berries		White flowers				Low	Drought tolerant		
Oxalis oregana	Wood sorrel	N	6" - 8"	1'	FACU	Moist, prefers acidic-neutral soil	Full to part shade	P / D	Attracts bees and butterflies, Host plant for moths larvae		White-pink flowers				Low	Not drought tolerant		
Polystichum munitum	Western sword fern	N	2' - 4'	2' - 3'	FACU	Moist to dry	Full to part shade	P / E	Fronds foraged on by mammals and nesting site for birds and small mammals			White-pink flowers			Low	Drought tolerant	Deer resistant	
Tellima grandiflora	Fringecup	N	1' - 2'	1' - 2'	FACU	Moist, well-drained	Part shade	P / D	Flowers attract bees and other beneficial insects			White-pink flowers			Low	Fire resistant	Slug resistant	
Tiarella trifoliata	Foam flower	N	6" - 1'	1'	FAC	Moist, well-drained	Part to full shade	P / D	Flowers attract bees and other beneficial insects			White flowers			Low	Drought tolerant, fire resistant		
Tolmiea menziesii	Youth-on-age	N	1' - 2'	1'	FAC	Moist to wet, well-drained	Part to full shade	P / D	Flowers attract bees and butterflies			Red-brown flowers			Moderate	Fire-resistant		
Trillium ovatum	Trillium	N	8" - 16"	1'	FACU	Moist to wet, well-drained	Part to full shade	P / D	Flowers attract bees and other beneficial insects		White-pink flowers				Moderate	Not drought tolerant		
Vancouveria hexandra	Inside-out flower	N	8" - 1'	1'	NOT LISTED	Moist to dry, mesic soils	Part to full shade	P / D	Flowers attract bees and other beneficial insects			White flowers			Low	Fire-resistant		
Viola adunca	Prairie violet	N	4" - 6"	1'	FAC	Moist, well-drained	Full to part sun	P / D	Attracts butterflies, host plant for larvae		Purple flowers				Low	Drought tolerant	Deer tolerant, slugs, snails, midge, powdery mildews, leaf spots	

APPENDIX E

Tree Canopy and Rewilding Maps and Tables

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Tree Canopy and Rewilding Opportunities

Through workshops and participatory mapping exercises, Redmond staff identified potential good areas for tree canopy expansion and rewilding. These areas are shown on the following maps (Figures 1 – 6), which also show all potential areas identified by Herrera's analysis, which is described in detail in Appendix F.

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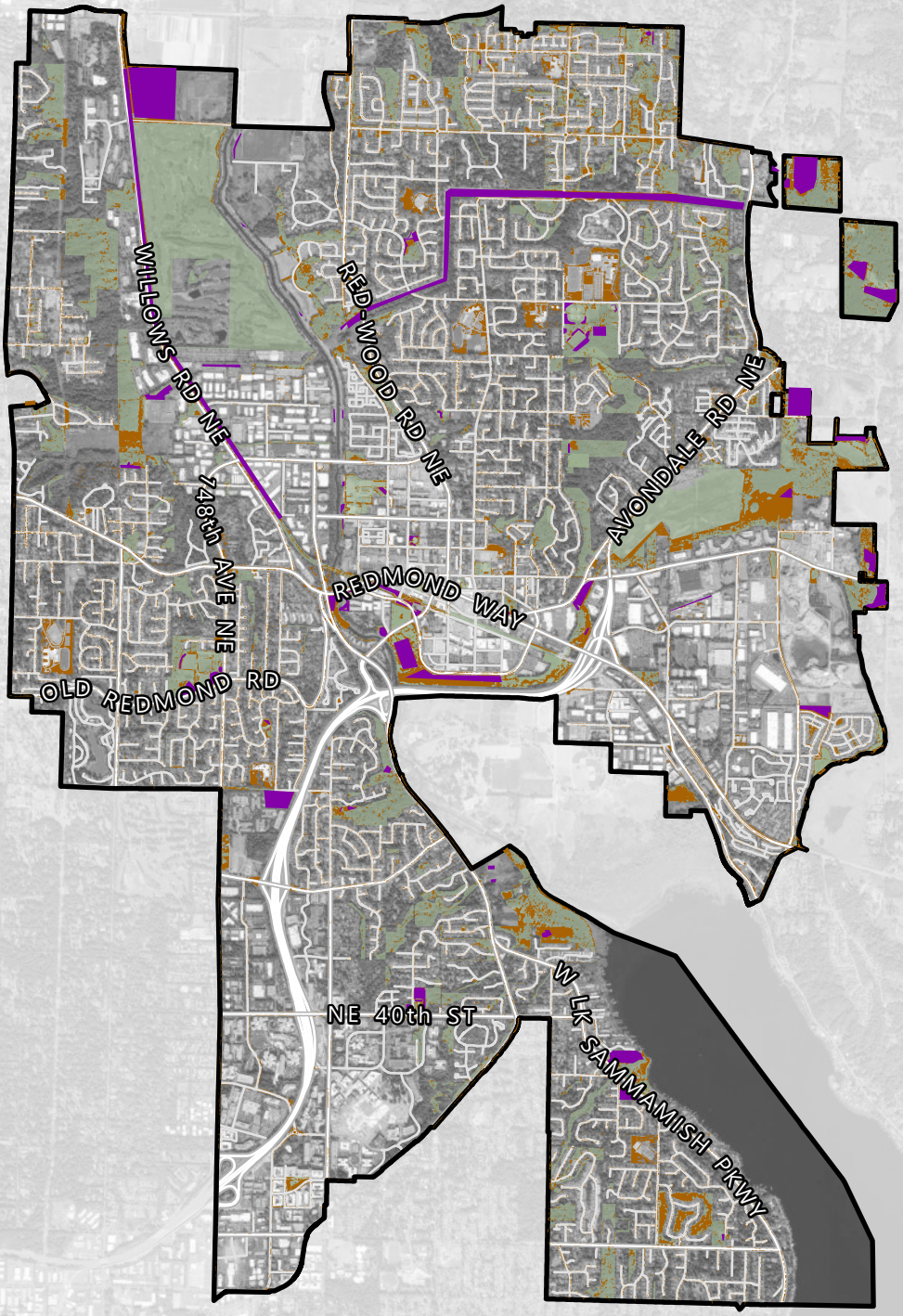
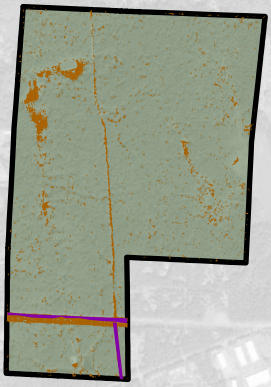
Figure 1.
Naturalized Meadow Areas.





Study Area

Parks and Natural Area Easements

Naturalized Meadow Areas

Rewilding Areas: Staff Identified

File Path: K:\Projects\V2023\23-08158-000\Pro\Redmond_Clim_Veg_Mngnt\Redmond_Clim_Veg_Mngnt.aprx\Report Figures
Date: 2/22/2024
Author: tdrickmore

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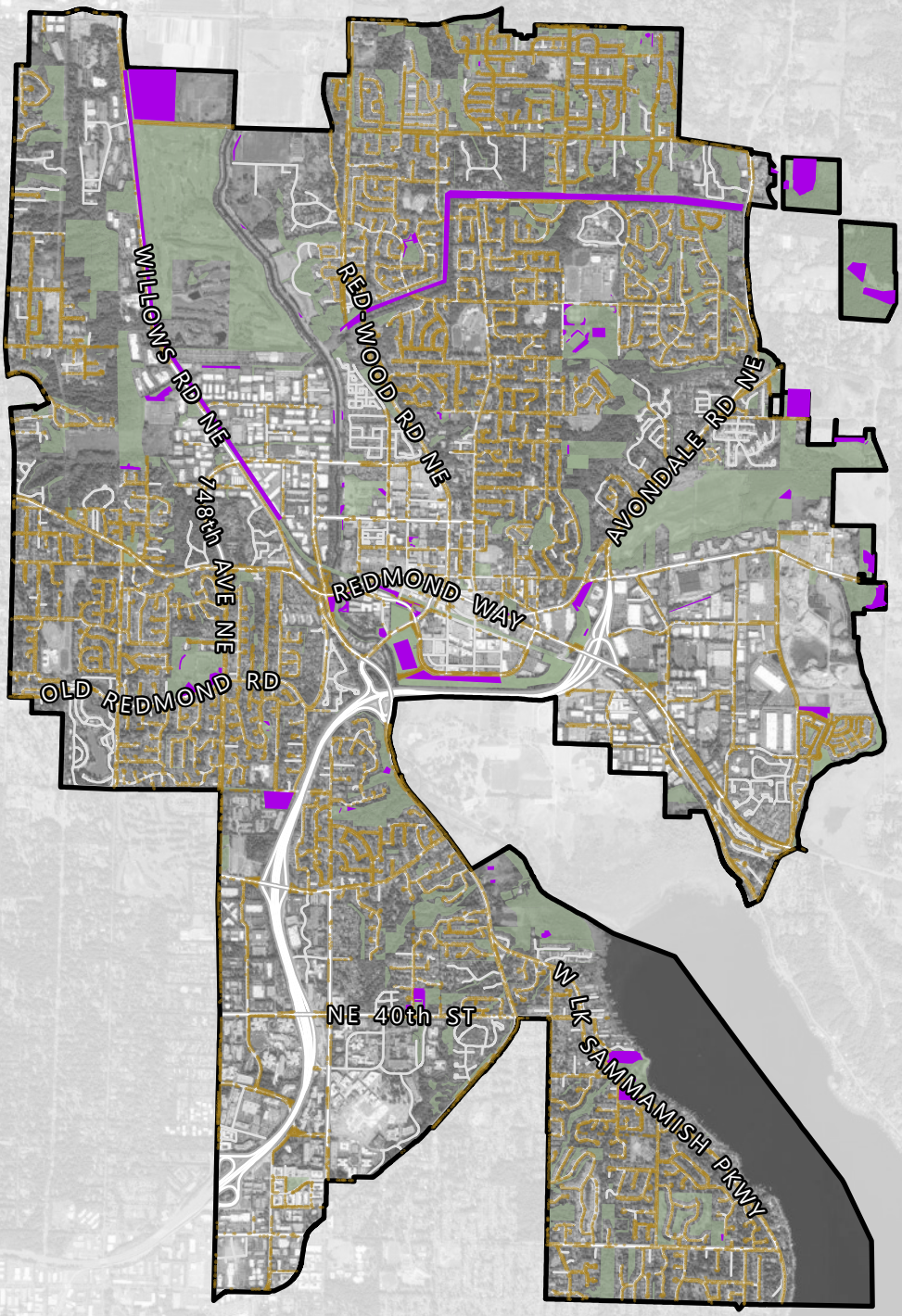
Figure 2.
Roadside Meadow Areas.



Study Area

Parks and Natural Area Easements

Roadside Meadow Areas

Rewilding Areas: Staff Identified

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources:

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Date: 2/22/2024
Author: tdrickmore

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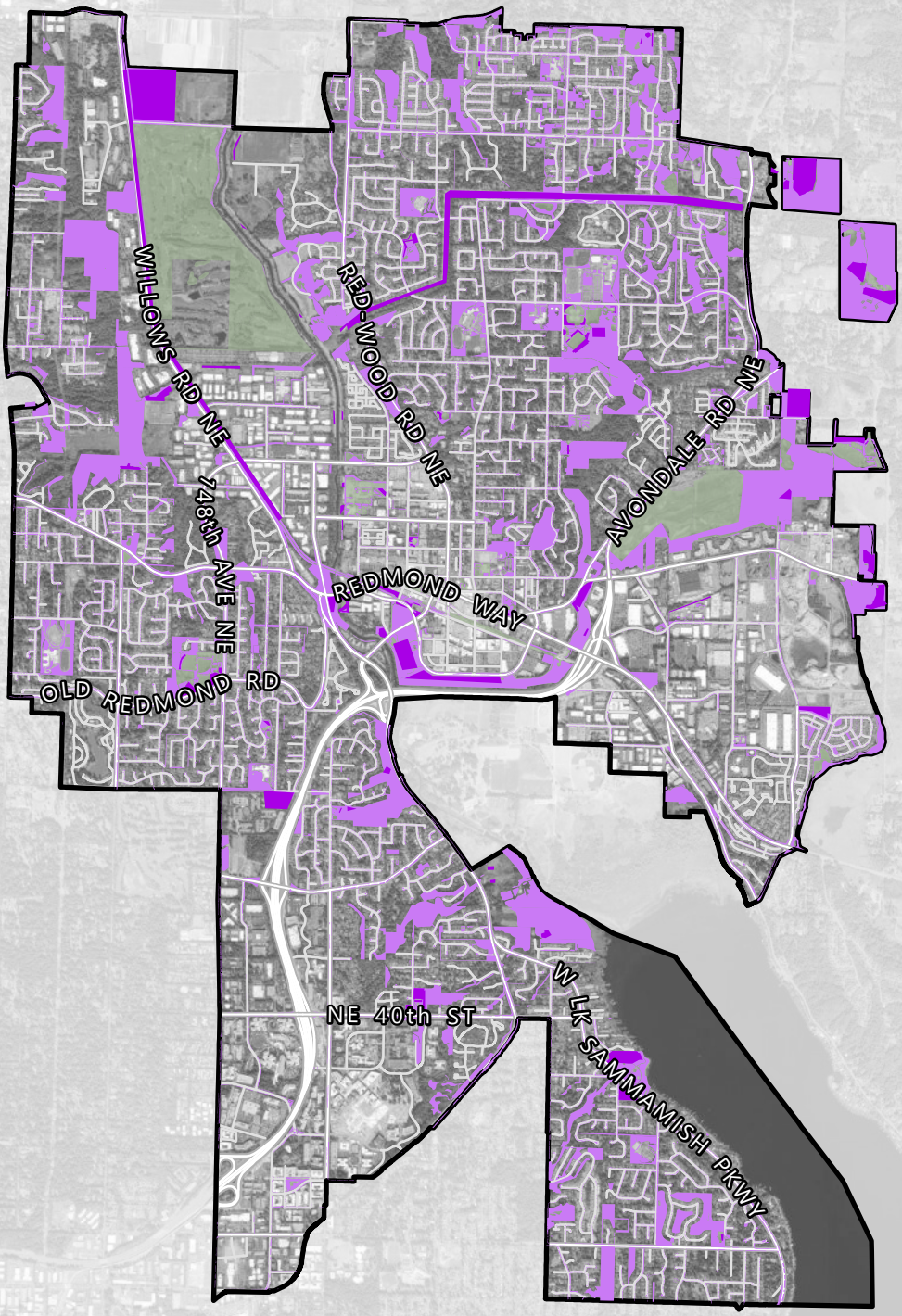
Figure 3.
Pollinator Garden Areas.



Study Area

Parks and Natural Area Easements

Pollinator Garden Areas

Rewilding Areas: Staff Identified

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources:

0 0.25 0.5 1 Miles

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Date: 2/22/2024
Author: tdrickmore

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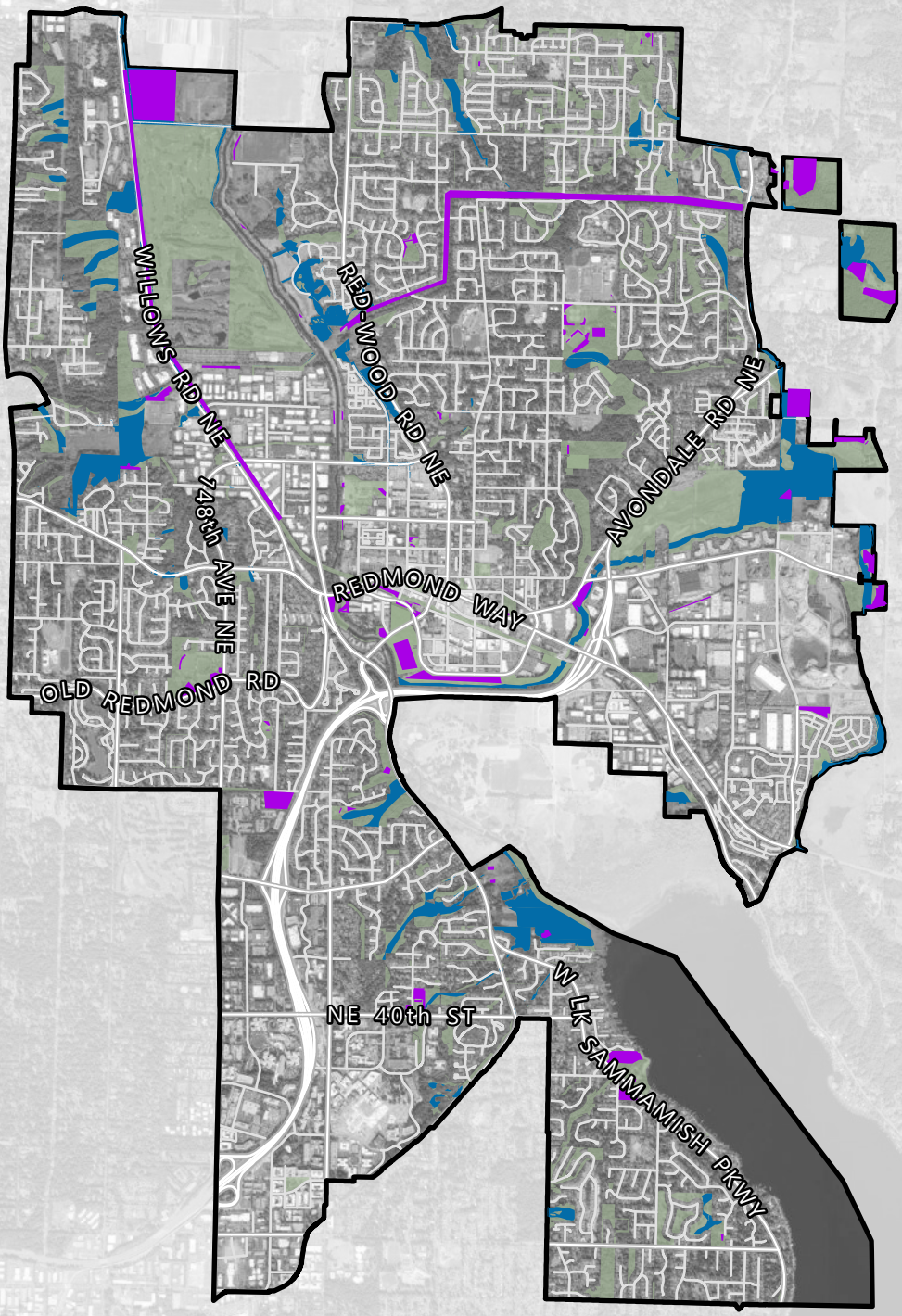
Figure 4.
Wetland Enhancement Areas.



Study Area

Parks and Natural Area Easements

Wetland Enhancement Areas

Rewilding Areas: Staff Identified

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources:

0 0.25 0.5 1 Miles

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Date: 2/22/2024
Author: tdrickmore

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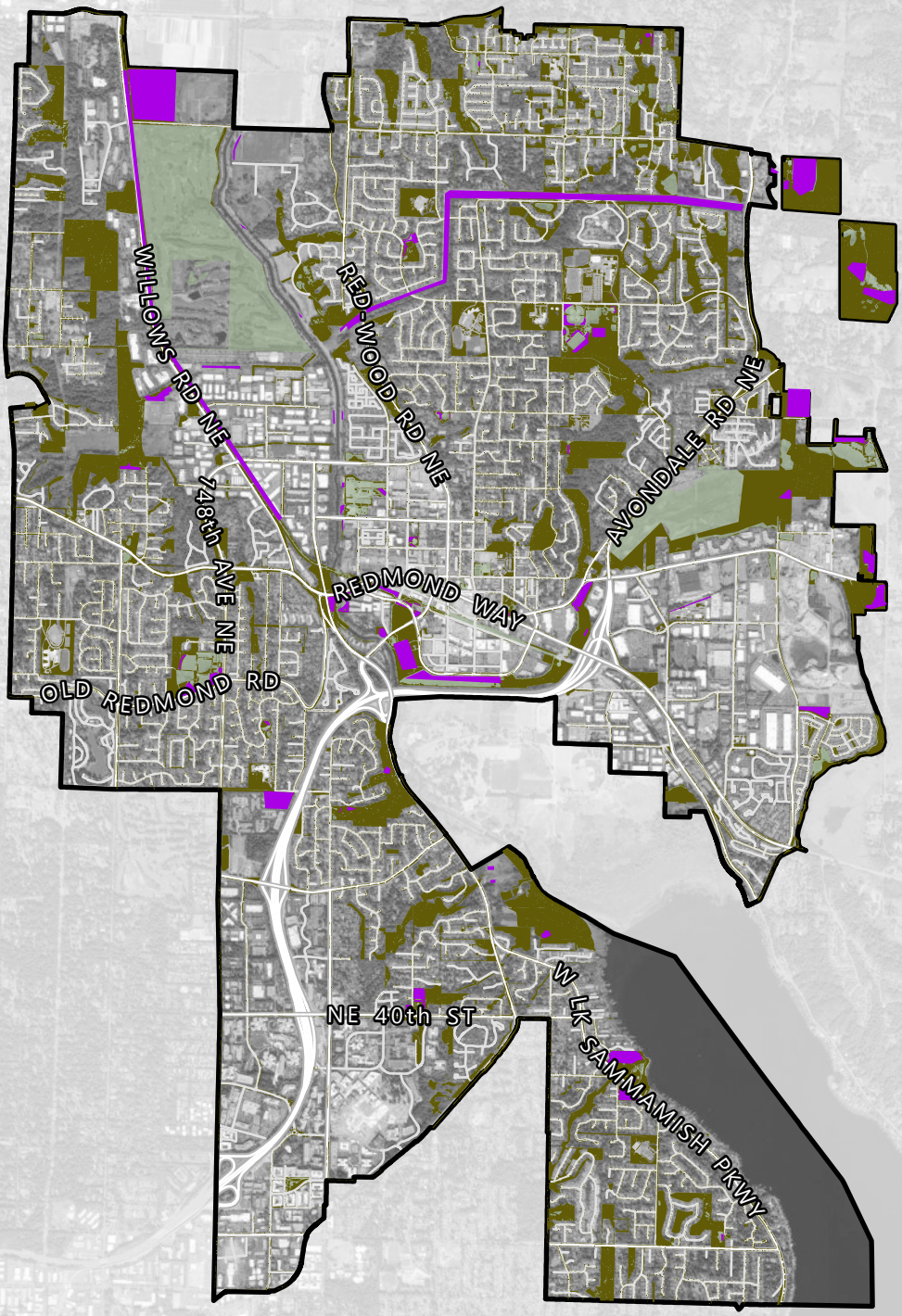
Figure 5.
Understory Areas.



Study Area

Parks and Natural Area Easements

Understory Areas

Rewilding Areas: Staff Identified

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Date: 2/22/2024
Author: tdrickmore

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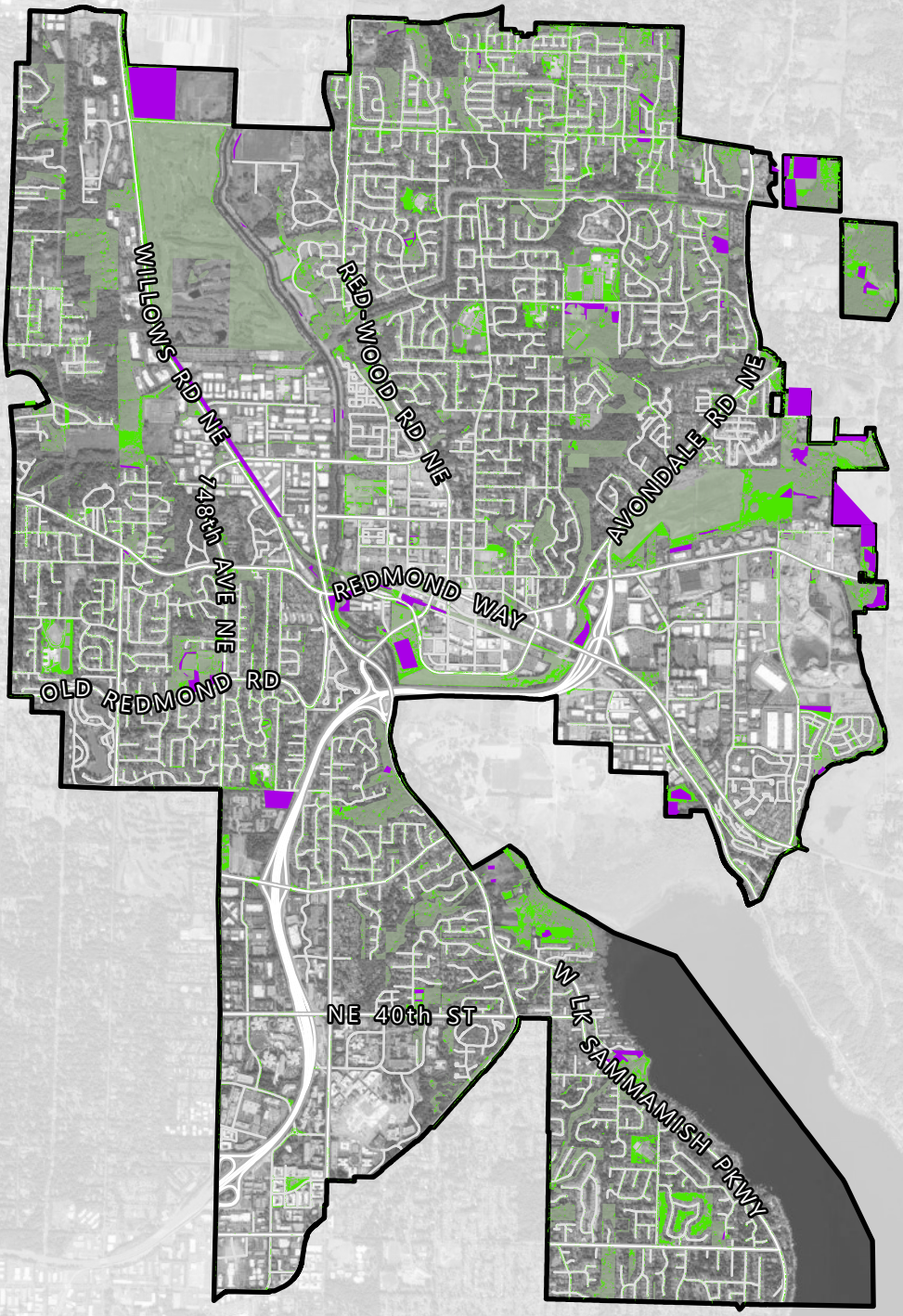
Figure 6.
Tree Canopy Expansion Areas.



Study Area

Parks and Natural Area Easements

Tree Canopy Expansion Areas

Tree Canopy Areas: Staff Identified

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Date: 2/22/2024
Author: tdrickmore

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APPENDIX F

Rewilding and Tree Canopy Mapping GIS Methodology

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Tree Canopy and Rewilding GIS Analysis Overview

Potential tree canopy and rewilding expansion areas were identified by selecting permissible areas where tree canopy/rewilding activities are allowed and removing exclusionary areas that would prohibit such activities. Results are reported as potential planting area polygons for tree canopy expansion or rewilding, by rewilding type. The draft results were reviewed by city staff to manually identify priority planting areas and remove inappropriate planting areas.

Data Preparation

Input datasets (Table F-1) were clipped to the Study Area (Redmond city limits and city-owned parcels) to reduce processing time and data storage requirements. Datasets were also projected to the project coordinate system (NAD 1983 HARN StatePlane Washington North FIPS 4601 US Feet).

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Table F-1. Input Data: Permissible Areas, Exclusionary Areas, and Miscellaneous Datasets.

Dataset or Analysis Category	Dataset	Description	Data Preparation
Permissible Area Component Datasets	COR_PublicParcels	Public Parcels within City of Redmond.	Subset of King County Public Parcels dataset. Includes parcels owned by City of Redmond and School District #414.
	COR_Parks	Parks within City of Redmond.	Dataset sourced from the Redmond GIS Services webpage.
	COR_NaturalAreaEasement	Areas that are in or close to a natural condition and are tracked to ensure they remain in that natural state.	Provided on request by City of Redmond.
	COR_ROW	Public Right of Way with City of Redmond.	ROW polygons are clipped from the King County Public ROW dataset. Manually edited to exclude ROW associated with SR 520.
Permissible Areas	Permissible_TreeCanopyExpansion	Merged dataset of permissible areas for tree canopy expansion.	Merge • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW
	Permissible_Meadows	Merged dataset of permissible areas for meadows.	Merge • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW
	Permissible_Roadside Meadows	Merged dataset of permissible areas for roadside meadows.	Includes only COR_ROW
	Permissible_Pollinator Gardens	Merged dataset of permissible areas for pollinator gardens.	Merge • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW
	Permissible_Wetland Enhancement	Merged dataset of permissible areas for wetland enhancement.	Merge • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW Clip to City of Redmond wetlands
	Permissible_Understory	Merged dataset of permissible areas for understory.	Merge • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW Merge • TreeCanopy2019 • Tree CanopyExpansion Clip to merge of existing canopy and proposed tree canopy expansion areas.

Table F-1 (continued). Input Data: Permissible Areas, Exclusionary Areas, and Miscellaneous Datasets.

Dataset or Analysis Category	Dataset	Description	Data Preparation
Exclusionary Areas	TreeCanopy2019	COR dataset depicting extent of existing tree canopy in the City of Redmond for 2019 based on aerial photography.	Provided on request by City of Redmond.
	Canopy_BAD	User defined as "bad" tree canopy expansion areas.	Constructed during Virtual Workshops and reviews with City of Redmond experts in January 2024.
	Rewilding_BAD	User defined as "bad" rewilding areas.	Constructed during Virtual Workshops and reviews with City of Redmond experts in January 2024.
	Slope_1to3	Represents areas with slope of greater than 1:3.	Based on slope analysis of King County West 2021 DEM tiles 103, 104, 105, 108 & 110. Tiles were mosaiced into a new raster and resampled to 6ft cells. ArcGIS Slope tool was used to reclassify areas into regions of more or less than a slope of 1:3. The Reclassified surface was converted to polygons and reprojected to the project coordinate system.
	ccap_Impervious_2021	Represents roads, pavement, and other impervious surfaces.	CCAP Version 2 Impervious Cover, Sourced from NOAA. Vectorized from raster surface for Analysis.
	COR_LandUseFeatures	Combined dataset of City of Redmond land use features incompatible with Tree Canopy Expansion and Rewilding.	Component datasets provided by City of Redmond on request. • Pond • Plaza • Playground • Pathway • Parking Lot • Field • Court • Building
Miscellaneous Data	COR_Road_Centerline	Centerline of road features within City of Redmond	Downloaded from City of Redmond Data Downloads site.
	Lake_WA_SD_414	Lake Washington School District 414	Subset of parcels extracted from King County Public Parcels dataset. Provided for reference by request from City of Redmond.
	Mask	Cartographic mask for display purposes	Negative geometry of study area.
	Study_Area	The geographic extent of analysis.	Includes the city limits, extended to incorporate park parcels that sit partially or entirely just beyond the city boundary. City Boundary and Parks datasets are sourced from the Redmond GIS Services webpage.
	COR_Wetlands	Wetland boundaries for the City of Redmond.	Provided on request by City of Redmond.

Planting Area Analysis Process

The following steps were followed to identify potential planting area polygons:

1. Compile the permissible and exclusionary areas for the planting category according to the requirements outlined in Table F-2.
2. Intersect permissible and exclusionary areas.
3. Select and delete features that do not geographically belong to the permissible areas dataset.
4. Select and delete feature that do belong to the exclusionary areas dataset. Potential tree canopy expansion and rewilding areas are the remaining polygons that fall within the permissible areas and outside exclusionary areas.

   Alternatively, the above process can be done using the erase tool in ArcGIS Pro, with permissible areas as the input feature classes and exclusionary areas as the erase feature classes. This workflow is documented in the provided Canopy and Rewilding Tool (Figure F-1). The Canopy and Rewilding Tool requires two inputs:

   - Exclusionary areas: multiple datasets as described for each canopy/rewilding category in Table F-2.
   - Permissible area: a single feature layer that is pre-processed for each canopy/rewilding category as described in Table F-2.
5. Delete small polygons from results. See Table F-2: Results Criteria for specific size thresholds applied for deletion.
6. Spatially join results with Climate Vulnerability Index data.

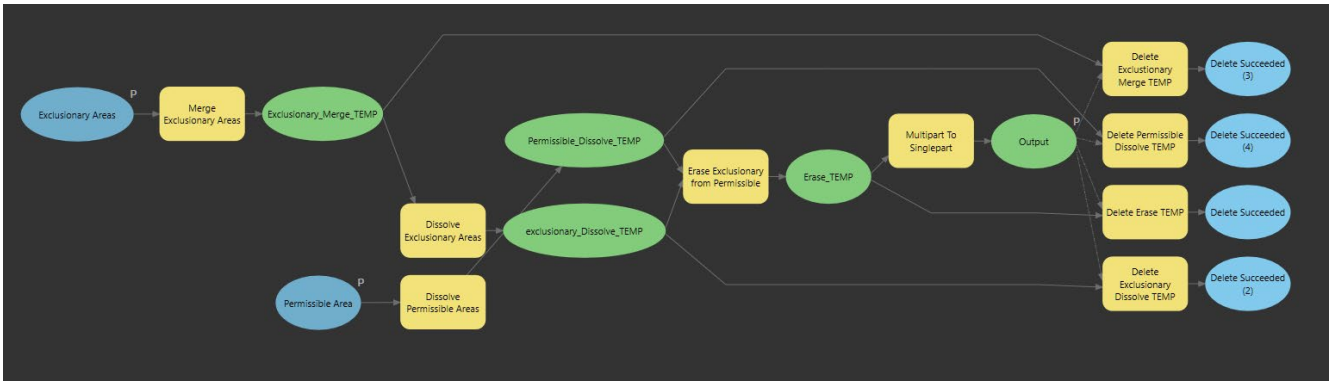

Figure F-1. Canopy and Rewilding Tool Planting Area Analysis Geoprocessing Workflow.

Table F-2. Results Criteria			
Results	**Permissible Areas**	**Exclusionary Areas**	**Minimum Feature Size**
Tree Canopy	• COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW	• Impervious2021 • COR_LandUseFeatures • Canopy_BAD • Buildings • Slope_1to3 • TreeCanopy2019	200 sq ft
Naturalized Meadows	• COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW	• Impervious2021 • COR_LandUseFeatures • Rewilding_BAD • Buildings • TreeCanopy2019	200 sq ft
Roadside Meadows	• COR_ROW	• Impervious2021 • COR_LandUseFeatures • Rewilding_BAD • Buildings • TreeCanopy2019	50 sq ft
Pollinator Gardens	• COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW	• Impervious2021 • COR_LandUseFeatures • Rewilding_BAD • Buildings	100 sq ft
Wetland Enhancement	Wetlands within: • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW	• Impervious2021 • COR_LandUseFeatures • Rewilding_BAD • Buildings	50 sq ft
Understory	Existing Tree Canopy or Proposed Tree Canopy Expansion Areas within: • COR_NaturalAreaEasement • COR_Park • COR_PublicParcels • COR_ROW	• Impervious2021 • COR_LandUseFeatures • Rewilding_BAD • Buildings	50 sq ft

City Staff Coordination and Review Process

Prior to the analysis, Herrera organized the first of two data review session with City of Redmond staff. Redmond staff digitized feedback polygons of 'good' and 'bad' areas for tree canopy expansion and rewilding based on their professional experience and knowledge of the city. The areas identified as 'bad' were used as exclusionary area input data for the analysis described above.

During the second review session, Redmond staff reviewed the initial model results and digitized additional polygons that included supplementary contextual information on what made them good or bad for tree canopy expansion and rewilding. The digitized feedback polygons from both sessions were then combined, reviewed, and edited for data integrity and consistency (see Table F-3). 'Bad' polygons were used as an exclusionary dataset in the final analysis, and 'good' polygons were included the analysis report figures and a data deliverable.

Table F-3. Feedback Data.

Dataset	Description	Data Preparation
Canopy_BAD	User defined as "bad" tree canopy expansion areas.	Constructed during Virtual Workshops and reviews with City of Redmond staff in January 2024.
Canopy_Good	User defined as "good" tree canopy expansion areas.	Constructed during Virtual Workshops and reviews with City of Redmond staff in January 2024.
Rewilding_BAD	User defined as "bad" rewilding areas.	Constructed during Virtual Workshops and reviews with City of Redmond staff in January 2024.
Rewilding_Good	User defined as "good" rewilding areas.	Constructed during Virtual Workshops and reviews with City of Redmond staff in January 2024.

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APPENDIX G

Field Checklists for Prioritizing Rewilding Opportunities

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Field Checklists for Prioritizing Rewilding Opportunities

The following checklists can be used to help guide field visits and discussion around which rewilding approaches may be most suitable for each potential site.

Table G-1. Checklists for Site Selection.

Vegetation Community	Checklist
Trees	**Feasibility** ☐ Access to water for first three years of plant establishment (could be irrigation system, truck, or other) ☐ No planned development ☐ If near paved area, sufficient space for utilities and root spread of mature tree (planting strip width for urban trees, plant spacing for natural area trees) ☐ If in ROW, preference for planting on lawn side (not between curb and sidewalk) ☐ If in a wetland, avoid areas with periods of extended standing water and plant FAC, FACW or OBL species only. **Co-Benefit Opportunities** ☐ Low existing tree canopy cover or area with urban heat island ☐ Visual screening benefit ☐ Declining tree or forest health ☐ Special interest: pathway borders, field perimeters, stormwater facilities, stream corridors and floodplains
Naturalized Meadows	**Feasibility** ☐ Underutilized space ☐ Away from heavy foot traffic **Co-Benefit Opportunities** ☐ Current areas that are challenging to maintain turf, shrub beds, or understory (e.g., steep slopes difficult to mow, base of trees, damp areas) ☐ Areas with invasive plant species ☐ Near other meadows and pollinator gardens for habitat connectivity ☐ Low existing vegetation diversity or area with urban heat island ☐ Overlap with future Wildlife Habitat Plan

Table G-1 (continued). Checklists for Site Selection.	
Vegetation Community	**Checklist**
Roadside Meadows	**Feasibility** ☐ Underutilized space ☐ Minimum width of five feet to provide enough space for pollinator safety and maintenance feasibility; wider sites are preferable because they appear to support greater numbers and diversity of pollinator species ☐ High density traffic areas may be less desirable for pollinators **Co-Benefit Opportunities** ☐ Areas challenging to currently maintain in current landscaping (e.g., time consuming maintenance, safety concerns, trees in decline) ☐ Areas with invasive plant species ☐ Near to other meadows and pollinator gardens for habitat connectivity ☐ Low existing vegetation diversity or area with urban heat island ☐ Overlap with future City of Redmond Wildlife Habitat Plan **Highly visible locations to public**
Pollinator Gardens	**Feasibility** ☐ Underutilized space ☐ Irrigation access ☐ Highly visible location to public ☐ No near-term planned development **Co-Benefit Opportunities** ☐ Areas with invasive plant species
Wetlands	**Feasibility** ☐ Wetland soils and hydrologic conditions **Co-Benefit Opportunities** ☐ Overlap with future City of Redmond Wildlife Habitat Plan ☐ Areas with invasive plant species
Understory	**Feasibility** ☐ Access to water for first three years of plant establishment (could be irrigation system, truck, or other) ☐ Existing tree canopy or co-established with tree canopy expansion area **Co-Benefit Opportunities** ☐ Areas with invasive plant species ☐ Areas of tree canopy expansion ☐ Overlap with future City of Redmond Wildlife Habitat Plan