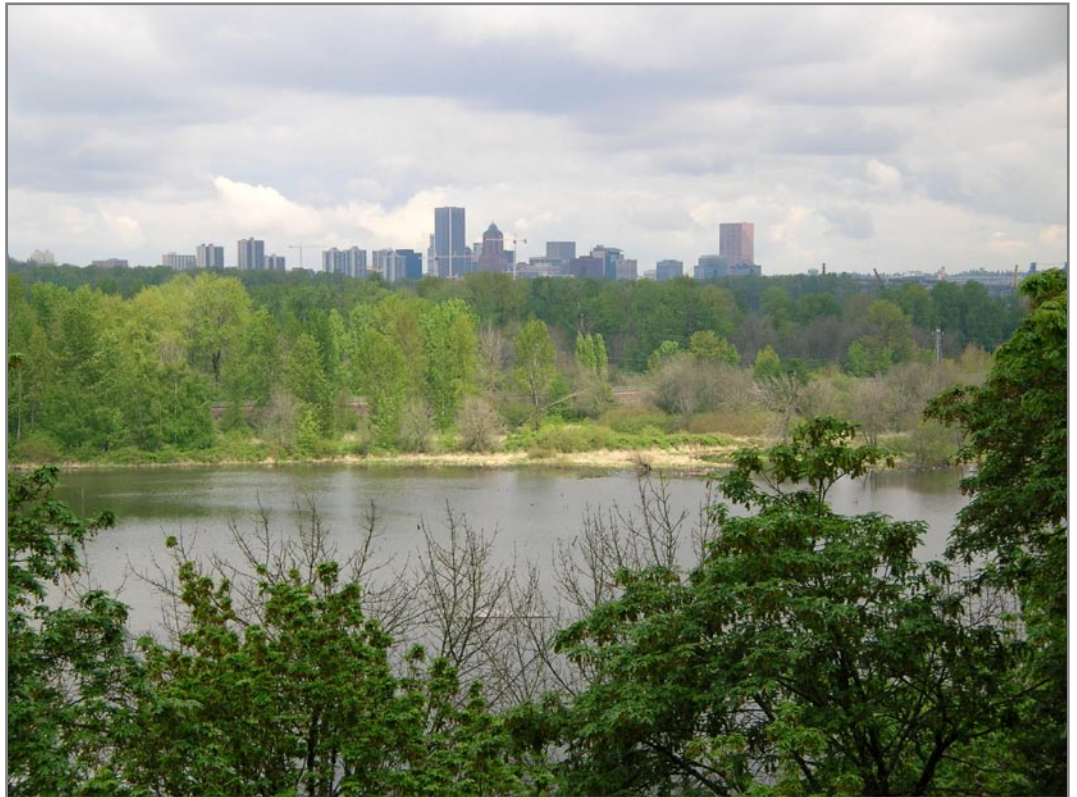




PORTLAND PARKS & RECREATION

Healthy Parks, Healthy Portland



Natural Areas Restoration Plan

October 2010

Update: March 2015



Natural Areas Restoration Plan Update

March 18, 2015

Portland Parks & Recreation (PP&R) completed the first system wide Natural Areas Restoration Plan (plan) in October 2010. The plan was completed as a requirement for Salmon Safe certification. It established restoration goals and strategies, management priorities and implementation actions. It is currently used to set restoration priorities (staff effort and funding) for natural areas. The plan stated that there would be a review and update every 3-5 years.

The 2014 update modified the functional methodology and revised the weighting to remove the emphasis on salmonids and their habitat needs. The 2014 Natural Area Management Priority Matrix changes are based on the updated natural resource function methodology and ecological health determined by the best professional judgment of the ecologist managing the site. The goals, strategies and implementation actions remain the same. This update also includes the natural area properties purchased since 2010.

Methodology Update

The methodology update evaluated additional functions and created a new weighting system. The original plan weighted functions associated with salmon habitat the highest while this update does not. Some of the updated functions were assigned weighted scores on a scale of 3 (high) to 1 (low) similar to the scoring used in the 2010 plan. A natural area was also given points for Terrestrial Ecology Enhancement Strategy (TEES) special status habitats and City of Portland At-Risk Species. The functions included are: (see attached memo for details):

- **Streams:** Perennial, non-perennial and within 100 feet of the natural area.
- **Riparian Relative Resource Value:** the percent of the natural area that is mapped as riparian vegetation.
- **Wildlife movement/connectivity:** evaluated three basic wildlife movement corridors – fly, walk and swim, from the natural area to water and/or other natural areas.
- **Habitat Size/Anchor habitat:** based on the TEES definition of “Anchor habitats are relatively large (e.g. generally over 30 acres) and currently provide conditions and functions favorable to biological communities.”
- **Habitat Restoration:** the investment PP&R and others have made to improve habitat conditions in the natural area. This includes both initial and maintenance efforts.
- **Frequency of Stewardship Activities:** volunteer groups, schools and stewards assist in improving the habitat functions and values through regularly schedule activities. This work assists in improving and maintaining natural areas.

Table 1: Natural Area Management Priority Matrix -2014

<i>Ecological Health</i>	<i>Watershed</i>	<i>Natural Resource Function and Value</i> Low (0-7)	Medium (8-15)	High (16-24)	Stabilization
Healthy (Healthy/Good)	Willamette River (WR)		Elk Rock Island	Forest Park North Forest Park Central	Baltimore Woods NA Flyway Wetlands NA
	Tualatin Basin/Fanno Creek (TB/FC)	Alder Ridge Natural Area Forest Heights Park			
	Tyron Creek (TC)		Maricara Natural Area		
	Johnson Creek (JC)		Buttes NA including Clatsop Butte Park & KD Bundy Park Deardoff NA Mitchell Creek Cottonwood Creek Indian Creek Errol Heights Beggars-tick Wildlife Refuge	Tideman Johnson Natural Area	
Fair	WR	Washington Parks NA Council Crest Park	Cottonwood Bay Hoyt Arboretum Willamette Moorage and Butterfly Park Terwilliger Parkway including George Himes and Duniway	Forest Park South Oaks Bottom Wildlife Refuge – includes Sellwood River Front, Oaks Crossing, and Ross & Toe Islands River View Natural Area Marquam Nature Park Willamette Park	
	TB/FC	Albert Kelly Park Sylvania Park	Ash Creek Natural Area & Dickinson Woods April Hill Park Woods Memorial Natural Area Gabriel Park Fanno Creek Natural Area Hamilton Park NA		
	JC	Kelly Butte Natural Area	Johnson Creek Park Powell Butte Lower Floodplain Veterans Creek NA Wahoo Creek NA	Powell Butte Nature Park Cottonwood Creek NA Indian Creek NA	
	TC	Tryon Creek Headwaters	Loll Wildwood Natural Area (West Portland Park Natural Area) Arnold Creek Natural Area Marshall Park include Jensen and Foley-Balmer Kerr Site		
	Columbia Slough (CS)		Moore & Wright Islands Johnson Lake Property Columbia Children's Arboretum Cross Levee NA	Kelley Point Park Big Four Corners Whitaker Ponds Natural Area Catkin Marsh	
Poor (Poor/Severely Degraded)	WR	Burlingame Park Fulton Park Governors Park Munger Property (includes Jefferson St. Property) Portland Heights Park Rosemont Bluff Natural Area Rocky Butte Natural Area Madrona Park	Mt Tabor Park Peter Kerr Property Stephens Creek Natural Area Powers Marine Park		
	TB/FC	Lesser Park			
	JC		West Lents Floodplain Foster Floodplain NA Wilkes Headwaters Natural Area		
	TC				
	CS		Columbia Slough Natural Area Colwood		

The data was collected through a review of geographical information (GIS), natural resource inventories, monitoring, and PP&R's ecologist's knowledge of the site. The factors were selected based on state, regional, and city natural resource priorities for protection, restoration, and enhancement. The total possible score for natural resource functions is 34 points, though 24 was the highest number of points recorded. Scores for all areas were graphed and break points in the scoring determined the range for each category. Natural resource function scores were grouped as Low (0-7), Medium (8-15), and High (16-24).

There are limitations to the functional assessment. For some sites At-Risk Species data is known through completed inventories, scientific studies and/or the Portland Area Watershed Monitoring and Assessment Program. For other sites, very little information is known.

Natural Area Management Priority Matrix

As in 2010, the ecological health and the natural resource function of the natural area are placed in a Natural Area Management Priority Matrix. The natural areas are put into nine management categories based on a combination of ecological health (Healthy, Fair or Poor) and natural resource function (High, Medium and Low) from Poor/Low to Healthy/High. In 2014 no natural areas fell into the Poor/High category.

In general, the ecological health of many natural areas improved from poor to fair and from fair to healthy. In 2010 45% of the natural area acres were rated healthy and in 2014 53% of the natural area acres are healthy. Using the 2014 function methodology shifted seven natural areas to a higher and 11 to a lower natural resource function rating. This shift is a result of eliminating the emphasis on salmon and their habitat, and evaluating a wider range of functions.

Natural Areas Restoration Plan

October 2010

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Table of Contents

Introduction 1

Methodology 3

Goals and Strategies 7

Conclusion 15

References 17

Appendices 19



Kelley Point Park

Introduction



Portland Parks & Recreation (PP&R) City Nature was formed in 2004 to raise awareness of the importance of natural areas and their contribution to the livability of our city. City Nature promotes the stewardship of natural areas and oversees a variety of activities that enhance their function and value. City Nature is responsible for managing over 8,000 acres of natural areas within the city limits ranging from Forest Park, at over 5,000 acres, to a web of small but very important natural areas along the Willamette River. Additional natural areas are managed as part of developed (hybrid) parks with advice from City Nature.

A major goal of PP&R's *Parks Vision 2020* is to 'preserve, protect, and restore Portland's natural resources.' The 2008-2011 PP&R Strategic Plan (updated May 2009) identified the following desired outcomes of this goal:

- Effective management of built and natural assets.
- Adequate land and facilities are provided to meet identified recreation, open space and biodiversity needs.

This plan helps achieve these outcomes.

In 2003, PP&R was the nation's first park system to be Salmon-Safe Certified. The certification listed ten conditions to be completed, including a system-wide, watershed-based strategic restoration plan. The plan includes a prioritized list of projects with their objectives and desired ecological outcomes for natural areas. It will guide PP&R in reaching the desired outcome of protecting and enhancing the biodiversity and ecological health of our natural areas, provide direction for near and long-term actions, and establish management priorities. It will be reviewed and updated approximately every 3-5 years.

The strategies in this plan are guided by the natural resource priorities, goals, and objectives established in the Salmon-Safe Certification (2004), the Portland Watershed Management Plan (2005), the OWEB Educational Outreach Strategy (2005), Oregon Conservation Strategy (2006), and the PP&R Natural Area Acquisition Strategy (2006). This plan is a broad level planning document. Its goals, strategies, and projects are a framework for the Ecosystem Management Steps that PP&R City Nature staff use to develop specific, science-based restoration actions for each natural area.

The Ecosystem Management steps are:

1. Vegetation Inventory
2. Desired Future Condition (25-year timeframe)

Introduction

3. Assessment: gap analysis between the inventory and the desired future condition
4. Prescription: specific, localized actions necessary to reach the desired future condition
5. Intervention: on-the-ground work
6. Monitoring: observations and data collection to measure the success of the intervention and to modify the prescriptions



Ross Island

Many projects have been undertaken by PP&R staff or with partnering agencies to evaluate and enhance the ecological health and connectivity of natural areas in the five major watersheds within the city. Data on each natural area was compiled and scored to determine the natural resource functions and values. A matrix was created to show the current ecological health and natural resource value of parks and natural areas in order to determine the management priorities for allocating limited resources.

Ecological Health

PP&R inventoried and surveyed the vegetation of its natural area parkland from 2003 to 2008 as step one in the ecosystem management process. This field methodology identified vegetation community characteristics such as dominant and invasive plant species, management concerns, and overall ecological health to inform park management and citywide natural resource planning. A total of 1,072 surveys were conducted covering 8,213 acres. The average unit size was eight acres (17 acres within Forest Park). Forest Park accounted for 4,743 (58%) of the total acres surveyed.

The surveys rated the ecological health of each unit from Healthy to Severely Degraded. The following table is a summary of the ratings:

Ecological Health Score	Acres	% of total Acreage
1 - Healthy	97	1.2
2 - Good	2,593	31.8
3 - Fair	3,128	38.3
4 - Poor	1,587	19.4
5 - Severely Degraded	757	9.3

For the purpose of the plan, Healthy and Good are combined to give an ecological health of Healthy. The category of Fair remained the same, and Poor and Severely Degraded were combined to give an ecological health of Poor.

Natural Resource Function and Value

The natural resource function and value is the cumulative score for the following weighted factors (see Appendix A) for individual natural areas or a set of natural areas that are managed as a unit (natural area complex):

- Salmon-bearing stream contained or within 100 feet of the property
- Stream (not salmon-bearing) contained or within 100 feet of the property
- Stream condition from PP&R 2007 inventory

Methodology

- Ecological health of the riparian area from surveys conducted in 2007 by PP&R
- Wildlife Assessment completed between 2003-2008 by PP&R
- Special habitat type identified by the City of Portland Bureau of Environmental Services Terrestrial Ecological Enhancement Strategy (TEES)
- Anchor habitat identified by TEES or an area greater than 30 acres
- Connectivity to Patches, Bureau of Sustainability and Planning (GIS layer updated regularly)
- Completed invasive species removal/native plant restoration
- Mid-size restoration project requiring permits such as grading
- Capital projects that significantly improved the ecological health
- Active volunteer/stewardship group
- Organized educational activities

The data were collected through a review of geographical information system (GIS), natural resource inventories, permits, planning documents, and interviews with PP&R staff. The factors were selected based on state, regional, and city natural resource priorities for protection, restoration, and enhancement. The total possible score for a natural resource function and value is 26 points, though 22 was the highest number of points recorded.

Natural resource function and value scores were grouped as Low (0-6), Medium (7-12), and High (13-22). Scores for all areas were graphed and break points in the scoring determined the range for each category.

Management Priority Matrix

The ecological health and the natural resource function and value of the natural area or natural area complex were listed in a Parks and Natural Area Management Priority Matrix to determine protection, enhancement, and restoration priorities for projects and management actions. For data consistency, the results from the 2003-2008 Ecological Health survey were used. Parks or natural areas where restoration activities have occurred and the ecological health has improved are marked with an asterisk (*) in the matrix. The parks are placed into nine management priority categories based on a combination of ecological health and natural resource function and value (Ecological Health/Natural Resource Function and Value) from Poor/Low (P/L) to Healthy/High (H/H).

Table 1: Natural Area Management Priority Matrix

Ecological Health	Watershed	Natural Resource Function and Value		
		Low	Medium	High
Healthy (Healthy/Good)	Willamette River (WR)			Forest Park North, Forest Park Central
	Fanno Creek (FC)	Forest Heights Park		
	Tyron Creek TC)		*Maricara Natural Area (NA)	
Fair	WR	Washington Park	Cottonwood Bay, Hoyt Arboretum, Marquam Nature Park	Forest Park South, Elk Rock Island, Oaks Bottom Wildlife Complex (Sellwood Riverfront, Sellwood, Oaks Crossing, Oaks Bottom Wildlife Refuge, Springwater-Willamette, Riverside, Ross Island, Toe Island)
	FC	Council Crest Park	Ash Creek NA, Dickinson Woods	
	Johnson Creek (JC)		Johnson Creek Park, Kelly Butte NA	Powell Butte Nature Park, Buttes NA Complex (Clatsop Butte, Gentemann Property, Kingsley D. Bundy, Eastridge, Campfire, Tenino)
	TC		West Portland Park NA, Arnold Creek NA, Tryon Creek Headwaters	Marshall Park Natural Areas (Jensen, Foley-Balmer, Marshall Park)
	Columbia Slough (CS)		Whitaker Ponds NA, Moore & Wright Islands	Kelley Point Park
Poor (Poor/Severely Degraded)	WR	Burlingame Park, Fulton Park, Governors Park, Portland Heights Park, Rosemont Bluff NA, Munger Property (includes Jefferson St. Property), North Escarpment Properties (Overlook Park & House, Madrona, Mocks Crest, Harbor View)	Cathedral Park, Mt Tabor Park, Peter Kerr Property, Rocky Butte NA, Stephens Creek NA, SW Terwilliger Complex (George Himes Park, SW Terwilliger Parkway, Duniway Park)	South Portland Riverbank Properties (Powers Marine, Willamette Moorage, Willamette Park, Butterfly Park)
	FC	Albert Kelly Park, Fanno Creek NA, Hamilton Park, Lesser Park, Sylvania Park, SW Thomas & 53rd	Gabriel Park, Woods Creek Complex (April Hill Park, Woods Memorial NA)	
	JC	Lents Floodplain	Leach Botanical Garden, West Lents Floodplain, Crystal Springs Hybrid Parks	Lower Powell Butte Floodplain, *Tideman Johnson NA, *Errol Heights NA
	TC	Kerr Site		
	CS	Columbia Children's Arboretum	Columbia Slough NA, Johnson Lake Property	
* indicates Ecological Health may have improved through restoration projects completed since the vegetation inventory				

Goals and Strategies



The overarching goals for the restoration plan are:

1. Contribute to the biological diversity of the Portland metropolitan region.
2. Preserve and improve the ecological health of natural areas.

To achieve these goals, PP&R management priorities are based on:

1. Size – the ability of the natural area to provide a full range of ecological services and potential for the greatest biodiversity.
2. Location – the proximity to salmon streams, connectivity for wildlife movement and transitional areas between habitat types.
3. Unique – sites that contain flora or fauna that is rare, threatened or endangered as identified by the Terrestrial Ecology Enhancement Strategy.

The restoration plan focuses on six management strategies based on ecological health and the natural resource functions and value to achieve its goals:

1. Establish a predominance of native vegetation (removal of invasive plant species)
2. Watershed-based salmon recovery
3. Preserve and restore biological diversity
4. Best management practices to enhance water quality
5. Engage the public
6. Monitoring and adaptive management

These strategies are applied to natural areas with the greatest potential for meeting the restoration goals.

In general, natural areas that have *high natural resource value independent of ecological health* have the greatest potential for meeting the restoration goals and are the highest management priority for City Nature. Overall, these areas are large, complex, and connected to fish-bearing streams or are unique. These areas include:

- Forest Park
- Oaks Bottom Wildlife Complex
- Buttes Natural Area Complex
- Marshall Park Natural Areas
- South Portland Riverbank Properties
- Lower Powell Butte Floodplain Complex
- Tideman Johnson Natural Area/Errol Heights Natural Area
- Powell Butte Nature Park
- Elk Rock Island

Goals and Strategies

The parks and natural area with *medium natural resource function and value, and either healthy or fair ecological health* will take more resources to restore than the previous group, but they still have good potential for improving ecological health and functions of the watershed and/or contain unique flora or fauna. Generally, these areas are medium size, and have a manageable infestation of invasive plants.

The larger areas in these categories include:

- Marquam Nature Park
- Johnson Creek Park
- Maricara Natural Area
- Kelly Butte Natural Area

Parks and natural areas with *medium natural resource function and value and poor ecological health* generally have a predominance of invasive species, are located adjacent to a stream, and/or are part of a hybrid parks. Improving the ecological health would potentially be costly but in the long term would meet the goals of the plan. These areas have a lower management priority than the sites with Healthy or Fair ecological health and medium natural resource functions and values.

Examples of these sites include:

- Woods Creek Complex
- Columbia Slough Natural Area
- Rocky Butte Natural Area
- West Lents Floodplain

Parks and natural areas with *low natural resource function and value and poor ecological health* tend to be small, disconnected from other areas, and often are part of a hybrid park. Large amount of resources would be needed to improve these areas or the ecological return on investment would be small. City Nature staff and resources have been reduced over the past three years because of the economic downturn and loss of general fund revenues. Natural areas in such poor shape will get little or no attention unless they are part of a larger project in the watershed.

Strategy 1 – Establish a predominance of native vegetation (removal of invasive plant species)

Native plant diversity provides an array of habitat functions including improved water quality, biodiversity, fish and wildlife habitat, tree cover, and reduction of fire risk. The ecological objective is to increase the size of weed-free habitats and maintain or increase native plant species. When sites are invaded by non-native plants, these functions are impacted. The City of Portland *Invasive Plants Strategy Report* (2008) sets out 10-year goals and a 3-year work plan for reducing invasive species in the city's natural areas. PP&R manages the greatest number of natural area acres within city limits, and continues to fight invasive species through a number of actions identified in the Invasive Strategy.

Using the Management Priority Matrix, the following invasive species removal actions protect and improve the ecological health of our natural areas:

1. Continue the Protect the Best Program – removal of invasive species from natural areas with Healthy and Fair ecological health and High natural resource function and value (H/H, F/H), and Healthy ecological health and Medium natural resource function and value (H/M):
 - Forest Park
 - Maricara Natural Area
 - Oaks Bottom Wildlife Complex
 - Buttes Natural Area Complex
 - Marshall Park Natural Areas
 - Elk Rock Island
2. Contract with the BES Revegetation Program or other contract crews to remove invasive species and replant native vegetation in natural areas with F/M, P/M, P/H. Follow up with neighborhood or friends group stewardship memorandum of understanding (MOU) to continue the work.
3. Early detection/rapid response (EDRR) prevents new introduction of invasive species and reduces the scale and spread of priority invasive species infestations across all properties. Train park technicians to identify and treat EDRR species.
4. Limit investment of staff resources in natural area in F/L and P/L categorized parks and natural areas unless there is a known special status habitat or species and/or a stewardship MOU is in place.

Strategy 2 – Watershed-based salmon recovery

Protect, expand, and restore salmon habitat within Portland’s five urban watersheds (see Appendix B – Map of Salmon Distribution in the City of Portland). Projects will restore natural channel processes, including reconnecting stream, wetland, and floodplains where possible, and restoring and enhancing riparian habitat. Predicted impacts from climate change will be factored into restoration of natural areas through the Ecosystem Management Steps.

PP&R will partner with the Bureau of Environmental Services, Metro, Soil and Water Conservation Districts, and watershed councils to provide the necessary resources and expertise to plan, design, and implement stream restoration, shallow water habitat, and riparian corridor plantings to provide functioning salmon habitat. Projects include:

Willamette River

1. Complete a Habitat Management and Trail Plan for the South Portland Riverbank Properties in 2011.
2. Restore riverbanks and floodplains:
 - Floodplain enhancement at Powers Marine Park
 - Riverbank restoration at Willamette Park
 - Riverbank restoration as shown in the master plan for Cathedral Park
 - Floodplain enhancement at Elk Rock Island
 - Beach and riparian restoration at SW Greenway Central Reach

Goals and Strategies

3. Replace culverts at:

- The railroad tracks at Stephens Creek Confluence to extend shallow water habitat in Willamette Moorage
- Oaks Bottom Natural Area to reconnect the Willamette to shallow water habitat

4. Restore riparian habitat:

- Continue to remove invasive species at Ross Island Natural Area and install native plant species in woodland and riparian areas.
- Restore and enhance the ecological health of Balch Creek riparian habitat through invasive removal and large woody debris placement; remove or modify artificially created instream structures; create sustainable access.

Johnson Creek

1. Restore Crystal Springs Creek and wetland habitat:

- Restore the wetland and stream at Westmoreland Park as shown in the master plan.
- Replace Crystal Springs culverts.
- Restore the wetland and stream at Eastmoreland Golf Course.
- Remove invasive species and plant native riparian plants along the pond to provide shade at Crystal Springs Rhododendron Garden. Explore the opportunity to restore the stream and wetlands within the garden.

2. Mainstem Johnson Creek:

- Create meanders and place large wood in the stream at the confluence of Johnson Creek and Crystal Springs at Johnson Creek Park.
- Complete a site assessment at Errol Heights to identify opportunities to increase the natural resource values.
- Enhance the riparian habitat at Leach Botanical Garden as shown in the master plan.
- Remove or redesign the impoundment structure at the west end of Leach Botanical Garden.
- Complete a Habitat Management and Trail Plan for Buttes Natural Area Complex and Clatsop Butte Nature Park.
- Continue wetland and riparian plantings at Lower Powell Butte Floodplain to increase stream shade and habitat.
- Assess and repair/replace if necessary the bridges along the Springwater Corridor to allow woody debris to stay in the system for improvement of stream health.

Tryon Creek

1. Remove fish barriers along Tryon Creek to restore populations to Marshall Park Natural Areas.

Columbia Slough

1. Monitor the placement of large woody debris and enhance riparian habitat at the Columbia Slough Confluence at Kelley Point Park for fish use.

2. Place large woody debris at Kenton Cove.

Strategy 3 – *Preserve and restore biological diversity*

As the city becomes more urbanized, natural area and wildlife corridor protection, restoration, and enhancement becomes more vital to maintain or increase species biodiversity. The City of Portland Terrestrial Ecology Enhancement Strategy (TEES) identified Special Status Species for plants and animals, and Special Status Habitats within the city limits to protect and enhance biodiversity (see Appendix C). These special status plants and animals are officially listed or identified by one or more agencies or non-governmental organizations as having declining or small populations at a regional or statewide level, as well as locally. Special status habitats were identified because they are State Conservation Strategy Habitats or are of particular importance in Portland. Also, it is important to protect habitat for our common native species. PP&R has identified natural areas that contain special status plants, animals, and habitats and are beginning to manage for them.

The following actions will help achieve the goal of contributing to the biological diversity of the region:

1. Oak Woodland Habitat

- Restore Elk Rock Island as a pilot project in partnership with BES (high priority).
- Restore Powell Butte Nature Park in partnership with Portland Water Bureau (high priority).
- Implement actions in the Forest Park Desired Future Condition to restore oak woodland habitat.
- Improve and enhance connectivity of oak woodland habitats in the North and South Willamette River escarpment through acquisitions and restoration on City properties.
- Invasive plant removal along Terwilliger Parkway.

2. Interior Forest Habitat

- Provide a detailed description of the vegetative communities present using an ecological sampling method.
- Continue to remove invasive species from Forest Park to enhance interior forest habitat.
- Restore interior canopy at Clatsop Butte Natural Area Complex.
- Restore canopy at Marquam Nature Park and associated forest areas.

3. Wetland/Riparian

- Enhance opportunities to restore complex habitat structure at:
 - a. Oaks Bottom Natural Area in conjunction with culvert replacement
 - b. Beggar's Tick Marsh
 - c. April Hill Park natural area – improve amphibian habitat
 - d. Powers Marine Park
 - e. Columbia Slough Natural Area properties in partnership with BES – improve painted turtle habitat
- Enhance amphibian habitat for red-legged frogs and other amphibian species at:
 - a. Oaks Bottom Complex
 - b. Powell Butte – partner with BES on native amphibian habitat improvements
 - c. Tryon Creek Headwaters – improve wetland and amphibian habitat

Goals and Strategies

- Inventory and map wetlands on PP&R properties.
4. Grasslands
 - Enhance native grassland and forb diversity at:
 - a. Powell Butte in partnership with the Portland Water Bureau
 - b. Within the oak woodlands of Elk Rock Island in partnership with BES
 - c. Restore small grassland at Foley-Balmer Natural Area
 5. Inventory natural areas to identify, protect and enhance rare, threatened and endangered flora and fauna species and their habitat. Collaborate with local academic institutions and researchers when appropriate.
 6. Continue to acquire properties based on the PP&R Natural Area Acquisition Strategy (November 2006) that “focus on protecting large, sustainable tracts of land and protect examples of exceptional value for habitat and watershed health.”
 - Willamette River – continue to focus on westside tributaries and Ross and Elk Rock Islands since opportunities are limited on the mainstem banks.
 - Johnson Creek – continue acquisition of the East Buttes Property and properties along the mainstem from SE 122nd to SE 162nd.
 - Tryon Creek – connect Tryon Creek Natural Area at SW Boones Ferry Road to other regionally-owned natural area properties; expand Marshall Park Natural Areas.
 - Columbia Slough – purchase riparian and wetland areas along the mainstem and Bridgeton Slough.
 - Fanno Creek – enlarge natural areas through acquisition of adjacent parcels.

Strategy 4 – *Best management practices to enhance water quality*

PP&R is committed to reducing water consumption and runoff in irrigated parks as part of our Salmon Safe Certification and our commitment to enhance water quality in streams and wetlands. By changing irrigated parks to the Maxicom system, conducting irrigation audits followed by performing a system tune-up, PP&R has reduced water use by approximately 20%. Salmon Safe recognized PP&R's excellent Integrated Pest Management (IPM) program during the certification process. PP&R continues to update its IPM protocols to reflect current scientific information, and continues to reduce waste and prevent pollution runoff.

The following actions will continue over the next five years:

1. Continue the Golf Greenway program at all five golf courses to enhance environmentally sensitive practices and their adjacent waterways. This program is a system of continual nutrient and elemental applications to reduce disease pressure, reduce weeds, enhance desirable grass species, improve playability, and encourage turf health. This includes water quality testing for nutrient levels and the presence of pesticides in surface waters on a twice-yearly basis.
2. Continue to evaluate approved IPM program pesticide lists, compiling and assessing all available research on old and new products. The goal is to ensure that products unsuitable for a particular use are deleted, products with better environmental and safety characteristics are utilized, and the best IPM decisions are made.

3. As funding allows, continue to move irrigated parks from an Automatic Irrigation System to a centrally-controlled Maxicom system based on weather data.
4. Inventory culvert conditions; establish a maintenance and replacement schedule.

Strategy 5 – Public engagement

Environmental education and stewardship activities are critical to helping citizens understand the connection between individual actions and broader environmental conditions. PP&R, other city agencies, and community organizations provide a variety of opportunities for groups to be involved in restoration projects and monitoring efforts. Adults and youth learn about natural area functions through ongoing as well as one-time activities. PP&R actively engages citizens living adjacent to natural area parks in order to create friends groups with long-term commitments that complement PP&R's ongoing projects and priorities. Service learning opportunities at schools and universities provide multiple benefits by allowing students to gain firsthand experience and engaging them in projects that benefit local communities. In addition, PP&R outreaches to pedestrian and bicycle trail users to educate them on the importance of staying on the trails to prevent habitat fragmentation, erosion, and invasive seed dispersal. PP&R has also been conducting target outreach to dog owners in natural areas to lessen pets' impacts on the environment.

The following actions will continue over the next 5 years:

1. Establish memorandums of understanding with friends groups and partners that support PP&R's priorities for improving the ecological health of the natural area. Each MOU defines measurable outcomes that are reviewed annually.
2. Provide for passive learning by instituting a comprehensive program of natural area interpretation through a series of signs, brochures, podcasts, and other outreach tools to educate visitors about the natural environment and sustainable access to nature.
3. Focus on programs that employ youth and work with volunteers to remove invasive species and educate the public about the impacts of invasive species on our ecosystems, such as the No Ivy League and the Youth Conservation Corps.
4. Continue to support formal and informal active Environmental Education programs for all ages and abilities.

Strategy 6 – Monitor and adapt management principles

Restoration projects should be designed to fulfill specific ecological goals and objectives. It is necessary to evaluate project outcomes through established monitoring protocols to understand if the built project is successful or if the design or implementation needs to be modified to achieve success. Often this step is underfunded or not funded. It is also important to monitor the trend of ecological condition of natural areas throughout the system based on standard protocols. Data collected on a periodic basis shows trends in the ecological health and natural resource functions and values based on implementation of Strategies 1-5.

Specific actions include:

1. Develop a system-wide monitoring program to track ecosystem health change over time.

Goals and Strategies

2. Complete a survey of natural area assets, both capital and non-capital.
3. Develop a site-based database to track restoration projects and monitoring information.
4. Share information and results with others through the Intertwine and other forums such as the Urban Ecosystem Research Consortium.
5. Establish a comprehensive, multi-variable research program for the park system.



Fringecup

Conclusion



PP&R continues to refine existing programs and implement new initiatives to maintain Salmon Safe Certification and improve the ecological health of our natural areas. Partnering with the Bureau of Environmental Services on salmon restoration allows PP&R to move forward with projects in the Willamette River, Columbia Slough, and Johnson Creek watersheds. The BES/PP&R partnership has also been instrumental in implementing the Invasive Species Strategy and in starting to implement high priority projects to restore biological diversity in Special Status Habitats. PP&R has reduced water use throughout the system and continues to improve its Integrated Pest Management program. Working with friends groups, educational institutions, and local stewards, PP&R is removing invasive species and planting native species along stream corridors and interior habitats.

Prioritizing management actions allows PP&R City Nature to target resources for projects and natural areas with the greatest potential for maintaining and meeting biodiversity and ecological health goals. Projects identified in Strategies 1 through 6 address specific needs and outline priorities for the natural area work.

As the general fund budget faces continual reductions, the Natural Area Management Priority Matrix will be instrumental in deciding where to put limited resources to meet restoration goals. Continuing relationships with established partners, and developing new ones, will allow PP&R to move forward on watershed restoration projects. However, once projects are completed, the long-term funding required for basic operations and maintenance of natural areas has not kept up with need. Given these limitations, PP&R will be strategic in selecting natural area projects areas that are large, located adjacent to streams, and/or part of a wildlife corridor, or have unique flora or fauna.

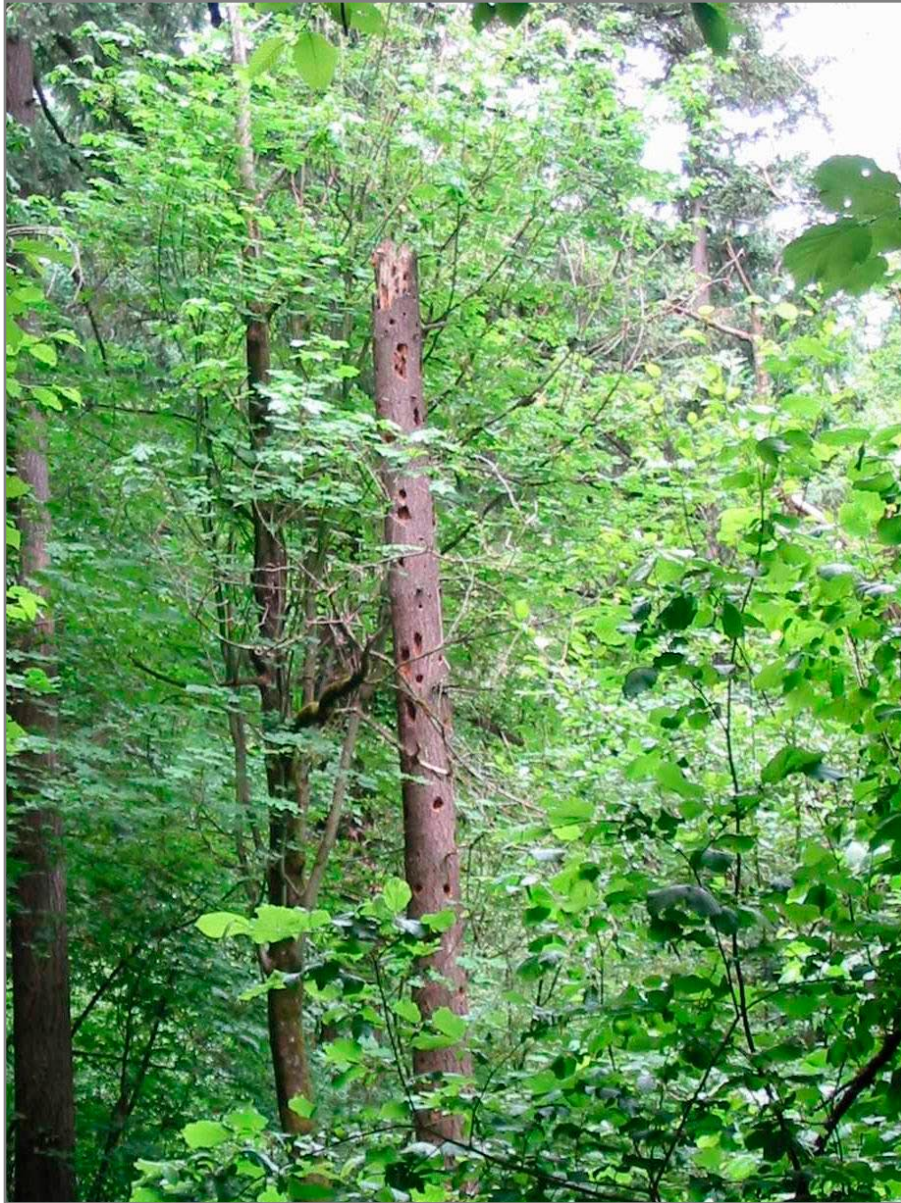


Maricara Natural Area

References



1. City of Portland Bureau of Environmental Services. 2005. *Portland Watershed Management Plan*. Portland, Oregon.
2. City of Portland Bureau of Environmental Services. 2008. *Invasive Plant Management Strategy*. Portland, Oregon.
3. Oregon Department of Fish and Wildlife. 2006. *Oregon Conservation Strategy*. Salem, Oregon.
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5. Portland Parks & Recreation. 2001. *Parks 2020 Vision*. Portland, Oregon.
6. Portland Parks & Recreation. 2006. *Natural Area Acquisition Strategy*. Portland, Oregon.
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8. Salmon Safe. 2004. Certification Letter to Portland Parks & Recreation.



Snag

APPENDIX A

Natural Resource Function and Value

Rating Criteria (weighted 1-3; total possible points are 26)

3 points

1. Salmon stream or within 100 feet of a salmon-bearing stream
2. State and federally listed species (other than salmon)
3. Greater than 30 acres or identified as an Anchor Habitat by TEES
4. Capital project designed or completed
5. Bureau of Planning's Connectivity rating is high

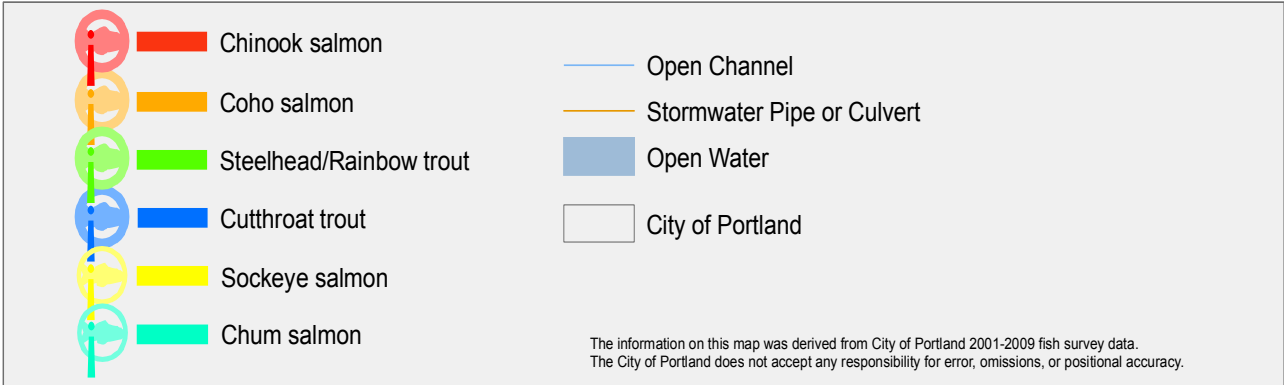
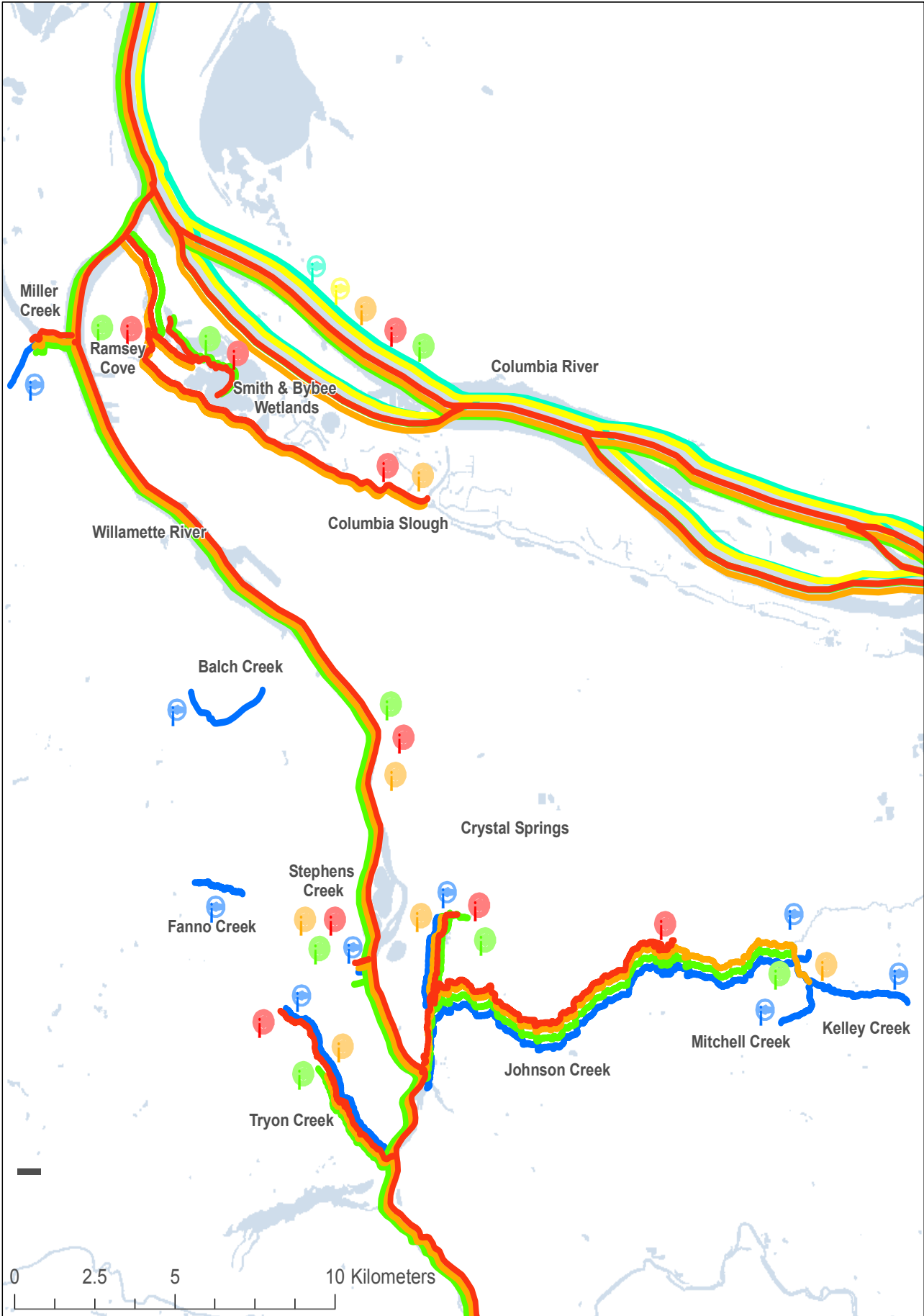
2 points

1. Contains a TEES Special Status Habitat: Oak Woodland, Herbaceous Wetland, Interior Conifer Forest, Riparian Habitat/Bottomland Hardwood Forest, Upland Prairie and Grasslands
2. Meets Salmon Safe Certification requirements for stream channel conditions: stream condition is rated fair or better
3. Riparian health rated fair to excellent
4. Permitted restoration completed or designed
5. Wildlife assessment greater than 68 (possible 112 points)
6. Bureau of Planning's Connectivity rating is medium

1 point

1. Active volunteer stewardship group or school
2. Weed subtraction and planting completed or planned
3. Wildlife assessment between 47 and 67
4. Contains or within 100 feet of a non-salmon-bearing stream (water quality benefits)
5. City or watershed council educational activities at the site
6. Bureau of Planning's Connectivity rating is low

Salmon Distribution in the City of Portland



APPENDIX C

Memorandum

To: City of Portland – Interested parties

From: TEES Team

Date: Monday August 17, 2009

Subject: City of Portland, Special Status Species – Plants

A list of “Special Status” plant species has been compiled by City of Portland TEES staff. The list (much like the Special Status Wildlife Species List) is compiled as an informational document. “Special Status” plant species are those listed by state and/or federal agencies as rare, threatened or endangered.

The method for choosing the Special Status Species Plants is as follows:

The list is based on the 2007 version of the Oregon Natural Heritage Information Center List of Rare, Threatened and Endangered Species of Oregon. The list includes species expected to be present in the Willamette Valley eco-region of Multnomah County that have an ORNHIC Heritage Rank of 1, 2, 3 and 4.

ORNHIC RANK 1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences. ORNHIC regards extreme rarity as a significant threat and has included species which are very rare in Oregon on this list.

ORNHIC RANK 2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences.

ORNHIC RANK 3 = Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences.

ORNHIC RANK 4 = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences.

The Special Status Species list also includes information about the grouping of species into Ranked lists as follows:

List 1 contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders. They can be very significant when protecting the genetic diversity of a taxon.

List 3 contains taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 contains taxa which are of conservation concern but are not currently threatened

or endangered. This includes taxa which are very rare but are currently secure, as well as taxa which are declining in numbers or habitat but are still too common to be proposed as threatened or endangered. While these taxa may not currently need the same active management attention as threatened or endangered taxa, they do require continued monitoring.

List 5 – The TEES Special Status Species list does not include those ranked 5, demonstrably widespread and secure.

Refinements for the TEES Special Status Species Plants that were selected from the ORNHIC lists included the following steps:

1. ORNHIC Plant Lists 1-4 were queried for their occurrence in Multnomah County.
2. To verify the presence of those plants in the Willamette Valley and Columbia River eco-regions the queried results were compared to:
 - a. *Urbanizing Flora of Portland 1806-2008* by John Christy et al.
 - b. *Flora of the Pacific Northwest: An Illustrated Manual* by C. Leo Hitchcock and Arthur Cronquist
 - c. *Plants of Western Oregon, Washington & British Columbia* by Eugene N. Kozloff
3. The list will be reviewed by botanists and ecologists familiar with the Portland area.

The list on page 24 is proposed as the 2009 TEES Special Status Species Plants List. The list is informational. It was developed to assist land managers and planners in identifying actions that will protect, restore, and enhance Portland Special Status Habitats and associated wildlife species.

Appendices

SCIENTIFIC NAME	COMMON NAME	Heritage Status - Rank	ORNHIC List
<i>Agrostis howellii</i>	Howell's bentgrass	S-2	1
<i>Cimicifuga elata</i> var. <i>elata</i>	Tall bugbane	S-3	1
<i>Delphinium leucophaeum</i>	White rock larkspur	S-2	1
<i>Delphinium pavonaceum</i>	Peacock larkspur	S-1	1
<i>Howellia aquatilis</i>	Howellia	S-1	1
<i>Rorippa columbiae</i>	Columbia cress	S-3	1
<i>Sericocarpus rigidus</i> (syn <i>Aster curtus</i>)	White-topped aster	S-2	1
<i>Sullivantia oregana</i>	Oregon sullivantia	S-2	1
<i>Castilleja levisecta</i>	Golden paintbrush	S-H	1*
<i>Artemisia campestris</i> var. <i>wormskioldii</i>	Northern wormwood	S-X	1*
<i>Carex comosa</i>	Bristly sedge	S-1	2
<i>Carex retrorsa</i>	Retorse sedge	S-1	2
<i>Delphinium nuttallii</i>	Nuttall's larkspur	S-1	2
<i>Fritillaria camschatcensis</i>	Indian rice / black lilly	S-1	2
<i>Heliotropium curassavicum</i>	Salt heliotrope	S-2	2
<i>Rotala ramosior</i>	Toothcup	S-2	2
<i>Wolffia columbiana</i>	Columbia water-meal	S-1	2
<i>Sedella pumila</i>	Sierra mock-stonecrop	S-H	2*
<i>Ammannia robusta</i>	Grand redstem (loosestrife family)	S-NR	3
<i>Elodea nuttallii</i>	Nuttall's waterweed	S-NR	3
<i>Hierochloe odorata</i>	Holy grass	S-NR	3
<i>Polygonum punctatum</i>	Dotted smartweed	S-NR	3
<i>Scirpus pallidus</i>	Pale bulrush	S-3	3
<i>Zizia aptera</i>	Golden alexanders	S-NR	3
<i>Bergia texana</i>	Texas bergia	S-3?	4
<i>Bolandra oregana</i>	Oregon bolandra	S-3	4
<i>Cypripedium montanum</i>	Mountain lady's-slipper	S-3, S-4	4
<i>Euonymus occidentalis</i>	Western wahoo	S-3	4
<i>Montia howellii</i>	Howell's montia	S-3, S-4	4
<i>Poa laxiflora</i>	Loose-flowered bluegrass	S-3	4
<i>Poa marcida</i>	Weak bluegrass	S-4	4
<i>Sidalcea campestris</i>	Meadow checker-mallow	S-4	4
			*extirpated

NR = Not yet ranked (2007 report)

H = Historical Occurrence (formerly part of the native biota with the implied expectation that it may be rediscovered)

X = Presumed extirpated or extinct

CODES AND ABBREVIATIONS

FEDERAL STATUS

LE	Listed as an Endangered Species
LT	Listed as a Threatened Species
PE	Proposed as an Endangered Species
PT	Proposed as a Threatened Species
C	Candidate for Listing as Threatened or Endangered
SOC	Species of Concern - Taxa for which additional information is needed to support a proposal to list under the ESA

STATE STATUS– ANIMALS

LE	Listed as an Endangered Species
LT	Listed as a Threatened Species
PE	Proposed as an Endangered Species
PT	Proposed as a Threatened Species
SC	Sensitive - Critical
SV	Sensitive - Vulnerable

STATE STATUS– PLANTS

LE	Listed as an Endangered Species
LT	Listed as a Threatened Species
PE	Proposed as an Endangered Species
PT	Proposed as a Threatened Species
C	Candidate for Listing as Threatened or Endangered

ECOREGIONS

BM	Blue Mountains (includes High Lava Plains)
BR	Northern Basin and Range (includes Owyhee Uplands)
CB	Columbia Basin
CR	Coast Range
EC	East Cascades
KM	Klamath Mountains
ME	Marine and Estuarine
WC	West Cascades and Crest
WV	Willamette Valley

STATES AND PROVINCES

AB	Alberta	NV	Nevada
AK	Alaska	NJ	New Jersey
AZ	Arizona	NM	New Mexico
AR	Arkansas	NY	New York
BC	British Columbia	NC	North Carolina
CA	California	NT	NW Territories
CO	Colorado	NS	Nova Scotia
HI	Hawaii	ON	Ontario
ID	Idaho	QC	Quebec
KS	Kansas	SK	Saskatchewan
LA	Louisiana	TN	Tennessee
MB	Manitoba	UT	Utah
MA	Massachusetts	WA	Washington
MS	Mississippi	WI	Wisconsin
MT	Montana	WY	Wyoming

NATURAL HERITAGE RANKS

G1	Critically imperiled throughout its range
G2	Imperiled throughout its range
G3	Rare, threatened or uncommon throughout its range
G4	Not rare, apparently secure throughout its range
G5	Widespread, abundant and secure throughout its range
S1	Critically imperiled in Oregon
S2	Imperiled in Oregon
S3	Rare, threatened or uncommon in Oregon
S4	Not rare, apparently secure in Oregon
S5	Widespread, abundant and secure in Oregon
T	Rank for a subspecies, variety, or race
Q	Taxonomic questions
H	Historic, formerly part of the native biota with the implied expectation that it may be rediscovered
X	Presumed extirpated or extinct
U	Unknown rank
?	Not yet ranked
B	Rank of the breeding population (migratory birds)
N	Rank of the wintering population (migratory birds)

MISCELLANEOUS

ESA	Endangered Species Act
EPA	Environmental Protection Agency
FED	Federal
NOAA	National Oceanic and Atmospheric Administration
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
OESA	Oregon Endangered Species Act
ORNHC	Oregon Natural Heritage Information Center
sp. nov.	species novum (new species) - in the process of being described in the literature
ssp.	subspecies
ssp. nov.	subspecies novum (new subspecies) - in the process of being described in the literature
TNC	The Nature Conservancy
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
var.	variety
+	taxon occurs in additional states

HERITAGE LISTS

1	Threatened or Endangered Throughout Range
2	Threatened, Endangered or Extirpated from Oregon, but Secure or Abundant Elsewhere
3	Review
4	Watch
2-ex	Extirpated in Oregon
1-X	Presumed extinct

City Of Portland Special Status Wildlife Species

The City of Portland has identified wildlife species that are officially listed or identified as being of concern by the following federal, state or other entities because they are rare, declining or of special interest:

- U.S. Fish and Wildlife Service: Candidate, Listed Threatened or Endangered, Species of Concern
- Oregon Department of Fish and Wildlife: Listed Threatened or Endangered, State Sensitive, State Strategy Species
- Oregon Natural Heritage Information Center: Ranked or Listed
- Oregon Watershed Enhancement Board: Priority Species
- Partners In Flight: Focal Species
- Northwest Power and Conservation Council Willamette Basin Subbasin Plan: Focal Species
- National Audubon Society's Watch List

The City's Special Status Species list is informational only, and is intended to assist land managers and planners identify actions that will help improve the status of these species and their habitats.

AMPHIBIANS	
Clouded Salamander	<i>Aneides ferreus</i>
Northern Red-legged Frog	<i>Rana aurora aurora</i>
REPTILES	
Northwestern Pond Turtle	<i>Actinemys marmorata</i>
Western Painted Turtle	<i>Chrysemys picta bellii</i>
BIRDS	
American Bittern	<i>Botaurus lentiginosus</i>
American Kestrel	<i>Falco sparverius</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Band-tailed Pigeon	<i>Columba fasciata</i>
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>
Brown Creeper	<i>Certhia americana</i>
Bufflehead	<i>Bucephala albeola</i>
Bullock's Oriole	<i>Icterus bullockii</i>
Bushtit	<i>Psaltirparus minimus</i>
Chipping Sparrow	<i>Spizella passerina</i>
Common Nighthawk	<i>Chordeiles minor</i>

Common Yellowthroat	<i>Geothlypis trichas</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Dunlin	<i>Calidris alpina</i>
Great Blue Heron	<i>Ardea herodias</i>
Green Heron	<i>Butorides virescens</i>
Hammond's Flycatcher	<i>Empidonax hammondi</i>
Hermit Warbler	<i>Dendroica occidentalis</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
House Wren	<i>Troglodytes aedon</i>
Hutton's Vireo	<i>Vireo huttoni</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Long-billed Curlew	<i>Numenius americanus</i>
Merlin	<i>Falco columbarius</i>
Nashville Warbler	<i>Vermivora ruficapilla</i>
Northern Harrier	<i>Circus cyaneus</i>
Olive-sided Flycatcher	<i>Contopus cooperi</i>
Orange-crowned Warbler	<i>Vermivora celata</i>
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Purple Finch	<i>Carpodacus purpureus</i>
Purple Martin	<i>Progne subis</i>
Red Crossbill	<i>Loxia curvirostra</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Red-necked Grebe	<i>Podiceps grisegena</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Short-eared Owl	<i>Asio flammeus</i>
Sora	<i>Porzana carolina</i>
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Thayer's Gull	<i>Larus thayeri</i>
Varied Thrush	<i>Ixoreus naevius</i>
Vaux's Swift	<i>Chaetura vauxi</i>
Vesper Sparrow	<i>Poocetes gramineus</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Western Sandpiper	<i>Calidris mauri</i>
Western Wood-Pewee	<i>Contopus sordidulus</i>
White-breasted (Slender-billed) Nuthatch	<i>Sitta carolinensis aculeata</i>
White-tailed Kite	<i>Elanus leucurus</i>

Appendices

Willow Flycatcher (Little)	Empidonax traillii brewsteri
Wilson's Warbler	Wilsonia pusilla
Winter Wren	Troglodytes troglodytes
Wood Duck	Aix sponsa
Yellow Warbler	Dendroica petechia
Yellow-breasted Chat	Icteria virens
MAMMALS	
American Beaver	Castor canadensis
California Myotis	Myotis californicus
Camas Pocket Gopher	Thomomys bulbivorus
Fringed Myotis	Myotis thysanodes
Hoary Bat	Lasiurus cinereus
Long-eared Myotis	Myotis evotis
Long-legged Myotis	Myotis volans
Northern River Otter	Lontra canadensis
Red Tree Vole	Arborimus = Phenacomys longicaudus
Silver-haired Bat	Lasionycteris noctivagans
Townsend's Big-eared Bat	Corynorhinus townsendii townsendii
Western Gray Squirrel	Sciurus griseus
White-footed Vole	Arborimus = Phenacomys albipes
Yuma Myotis	Myotis yumanensis

