Invasive Species Strategy 2020-2030

Portland at the Crossroads

December 2019

Losing ground on invasive species management would jeopardize Portland's investments and put at risk the City's green and grey assets: its parks, natural areas, and urban forest, its water pipes, stormwater structures, and wastewater treatment facilities.

A Portland Parks & Recreation crew member fells an invasive tree. (PHOTO: PP&R)

Portland is a national leader in taking proactive, coordinated steps to combat invasive plants, and during the past decade the City has achieved 90 percent of the goals it set for itself in its groundbreaking 2008 Citywide *Invasive Plants Strategy Report*.[1]

Despite these successes, existing invasive species—together with stressors such as climate change, loss of habitat, and the increasing human population—continue to threaten local watershed health and the integrity of the City's assets. New species are becoming established, and some particularly damaging invasive animals (e.g., the emerald ash borer, Asian long-horned beetle, and zebra and quagga mussels) will eventually find their way to the Portland area. The City's current level of funding will not meet the coming challenges.

Partnerships. Efforts by the City and partners like the Mt. Tabor Weed Warriors have managed to keep some invasive species from establishing and spreading. Continued and increasing efforts to engage people to become good stewards of the City's green assets will be part of the strategy for the next decade.

Losing ground on invasive species management would jeopardize Portland's investments and put at risk the City's green and grey assets: its parks, natural areas, and urban forest; its water pipes, stormwater structures, and wastewater treatment facilities. Threats include:

- **Ivy, clematis, garlic mustard, and other invasive plants.** So far, City bureaus have held many invasive plants in check at key locations. Otherwise they would overgrow Portland's parks, natural areas, forests, and waterways, thus increasing wildfire risk and reducing fish and wildlife habitat, shade for streams, recreational opportunities, flood attenuation, and other ecosystem services.
- **Emerald ash borer.** This invasive beetle, established as far west as Colorado, kills North American ash trees. If established in Portland, it likely would eliminate up to 5 percent of Portland's urban forest canopy and cause local extinction of native Oregon ash trees. The associated

1 *City of Portland Invasive Plants Strategy Report* (2008), developed in response to Resolution 36360. www.portlandoregon.gov/bes/article/332727

PHOTO: BES

Portlanders love their natural areas

In a recent multilingual survey of 8,800 community members, having access to the outdoors and natural areas was the top feature that respondents liked about living in Portland. This was true regardless of age, race, or length of residency in the city.

—*2019 Portland Insights Survey. 2019. City of Portland and HRA. www.portlandoregon.gov/cbo/article/740406.*

loss of shade likely would increase the urban heat island effect and cause stream temperatures to rise, jeopardizing local salmon habitat and the City's compliance with the Clean Water Act.

- **Zebra and quagga mussels.** These Eurasian freshwater mussels clog water intake pipes, filters, and other structures at power generation, water, and wastewater facilities, including stormwater outfalls. In the Great Lakes region, utilities spend hundreds of thousands of dollars—even millions—each year to control these mussels. The City of Portland could face similar costs if zebra or quagga mussels spread from California, Nevada, or Montana to the Columbia River Basin. The City is working with partners on prevention efforts.

PHOTO: Marrone Bio Innovations

Quagga mussels block a water pipe in Michigan. Work to prevent the spread of invasive species protects Portland's water and wastewater infrastructure.

The spread of invasive species has the potential to damage local ecosystems, increase the cost of City services, and reduce Portlanders' quality of life.

City staff and partners' diligent past and current efforts have managed to keep some of these species from establishing and spreading. But success in the future will require additional investments in planning and program development, outreach and engagement, inventorying and assessment, and control and restoration.

The City of Portland has updated its invasive species strategy for the next decade. This fulfills the City's responsibility to protect its previous investments and meet the challenges brought by new invaders, both plant and animal.

Tackling Invasive Plants through a Groundbreaking Strategy

Since 2009, the City has coordinated management of invasive species using its *Invasive Plants Strategy Report*, which gained national attention at the time it was published. In Portland, this strategic plan informed the City's investments in green infrastructure, spurred creation of the Bureau of Environmental Services' (BES) Invasive Species program, and led to new partnerships and collaborations, on-the-ground actions, and the engagement of community members in natural area stewardship. The report also included recommendations for policy review, which resulted in substantial changes to code and policy concerning invasive plants.

Green Assets

For years, the City has been developing and protecting its green assets—those natural resources such as the urban tree canopy, parks, natural areas, riparian areas, wetlands, community gardens, and bioswales that, collectively, provide a valuable suite of ecosystem services.

PHOTO: BES

Green assets at work. The Mason Flats Wetland manages stormwater from 600 acres of neighborhood streets in northeast Portland while providing habitat for sensitive wildlife species and protecting water quality in the Columbia Slough. The invasive species reed canarygrass threatens the survival and diversity of the native vegetation essential to the wetland's functions.

Green assets fall into three categories:

PHOTOS: BES

Natural

Wetlands, forests, riparian areas, natural areas, floodplains, soil, etc.

Forest Park, NW Portland

Enhanced

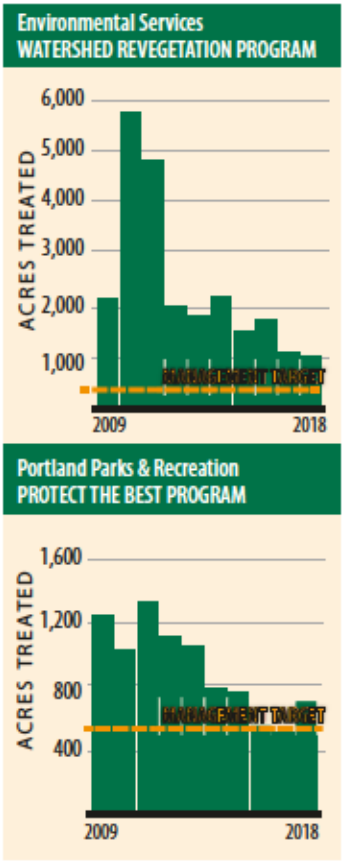
Developed parks, community gardens, rain gardens, constructed wetlands, street trees, etc.

NE 72nd Avenue Community Garden at Cully Park, NE Portland

Engineered

Ecoroofs, bioswales, green street planters, stormwater ponds, permeable pavement, etc.

Ecoroof, Columbia Blvd Wastewater Treatment Plant Wet Weather Screening Facility, N Portland



Bureau programs carrying out the work of the original strategy have exceeded their management targets each year.

Of the 44 objectives in the 2008 *Invasive Plants Strategy Report*, only four (9 percent) were not completed. Successes include:

- Treating 1,666 acres affected by garlic mustard, giant hogweed, water primrose, and other plants. This work was coordinated through BES's Early Detection Rapid Response (EDRR) program.
- Removing invasive plants from 4,588 acres of natural areas through BES's Watershed Revegetation program and 5,183 acres through Portland Parks & Recreation's (PP&R) Protect the Best program. This exceeds the goals of 700 and 4,804 newly treated acres, respectively, in the 2008 strategy.
- Removing 20,324 invasive trees from ecologically healthy natural areas, through the Protect the Best program.
- Reducing wildfire risk on 800 acres of natural area (500 acres more than the 300 acres prescribed in the 2008 strategy) by removing invasive vines that help fire move into the forest canopy.
- Mobilizing community members to learn about and take part in invasive species control through PP&R's volunteer stewardship program, classroom education and student field trips (more than 2,000 students per year), and Youth Conservation Crew (36 teens employed each summer).
- Establishing partnerships with the Oregon Departments of Agriculture and Forestry, USDA's Animal and Plant Health Inspection Service (APHIS), Metro, and local soil and water conservation districts, watershed councils, and friends groups to prevent and control invasive species.

A Legacy of Success

For decades, the City of Portland has guided its invasive species management efforts through key resolutions, management plans, and initiatives.

1988
Integrated Pest Management program established.

1991
Portland Plant List identifies native, nuisance and prohibited plants.

1994
No Ivy League established.

2005
Portland Watershed Management Plan identifies invasive species as a threat.

Landscape provisions prohibit nuisance plants on City-required landscaping.

City adopts Resolution 36360 to reduce invasive plants.

2006
Framework for Integrated Management of Watershed Health identifies invasive species as a threat.

City adopts Resolution 36384 to adopt the Portland Watershed Management Plan and Framework.

2007
City ramps up investments in green infrastructure projects through the Grey to Green Initiative.

Protect the Best Program begins.

EDRR in Action: *Ludwigia* in the Lower Columbia Slough

PHOTO: Elaine Stewart, Metro

In 2017, when BES's Early Detection Rapid Response (EDRR) program surveyed three miles of the lower Columbia Slough, it detected, mapped, and managed a handful of patches of *Ludwigia peploides* (water primrose). This aquatic plant readily clogs wetlands, forming dense mats that create mosquito habitat, interfere with fishing and boating, and reduce floodwater storage capacity. *Ludwigia peploides* also outcompetes native plants, including first foods, such as Wapato, that are of cultural significance to local tribes. BES and PP&R continue to partner with Multnomah County Drainage District and Metro to survey for and manage this very destructive invasive species.

Wapato site in the Columbia Slough photographed above in 2007.

Same site in 2017 has almost no wapato present before restoration work began.

Following restoration work, the wapato returned by 2019.

PHOTOS: BES

2008
Invasive Plants Strategy Report published.

2009
Resolution 36726 establishes 10-year goals to reduce level of invasive plants.

Aquatic Invasive and Nuisance Species Standard Operating Protocol Approved for the Bull Run Watershed and Sandy River Basin.

2010
City adopts Ordinance 183534 to strengthen City codes and update the Portland Plant List to establish an invasive plant ranking system.

2012
City adopts Resolution 36920 Reaffirming the City's commitment to watershed health.

2013
Invasive Plant Standard Operating Protocol for the Bull Run Watershed Management Unit.

2015
Tree code updated.

2016
Portland Plant List updated; standardized risk assessments for invasive plants implemented.

Bull Run Invasive Species Management Plan completed.

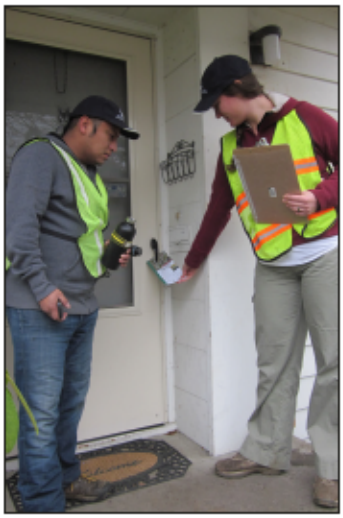


PHOTO: BES

Expanded outreach. The new strategy will expand outreach and education with a focus on reaching historically underserved or underrepresented communities.

Updating the Strategy for the Coming Decade

BES has worked with Portland Parks & Recreation, Portland Water Bureau, Portland Bureau of Transportation, Bureau of Planning and Sustainability, and Bureau of Development Services to update the City's invasive species strategy for the coming decade, building on the previous strategy and the City's intervening work – both successes and lessons learned. The modified approach offers a path forward based on current conditions. It evaluates the City's progress so far, identifies shortcomings and gaps, presents new 10-year goals, and prioritizes five-year implementation actions in six areas:

1. Detecting new introductions of invasive species.
2. Preventing the introduction and spread of invasive species.
3. Controlling and managing invasive species to minimize their spread and deleterious effects on ecosystems that are in healthy or fair condition.
4. Restoring and rehabilitating green assets affected by invasive species.
5. Engaging people to become good stewards of the City's green assets.
6. Continuously improving the City's ability to manage invasive species and maintain its desired levels of service.

Also included are metrics for use in tracking the City's progress. Metrics include the number of acres treated (both initial treatments and subsequent retreatments[2]) and—for each site—how the percentage of native plants, natural resource functions, and natural resource values change over time.

New conditions and threats call for an updated approach to invasive species management.

	Original Invasive Plants Strategy (2008-2019)	Invasive Species Management for 2020-2030
Scope	Plant species	Plant and animal species (emerald ash borer, zebra mussels, quagga mussels, etc.)
Threat focus	Threats to green assets (parks, natural areas, green spaces)	Threats to grey assets (pipes, pump stations, wastewater treatment facilities) as well as green assets

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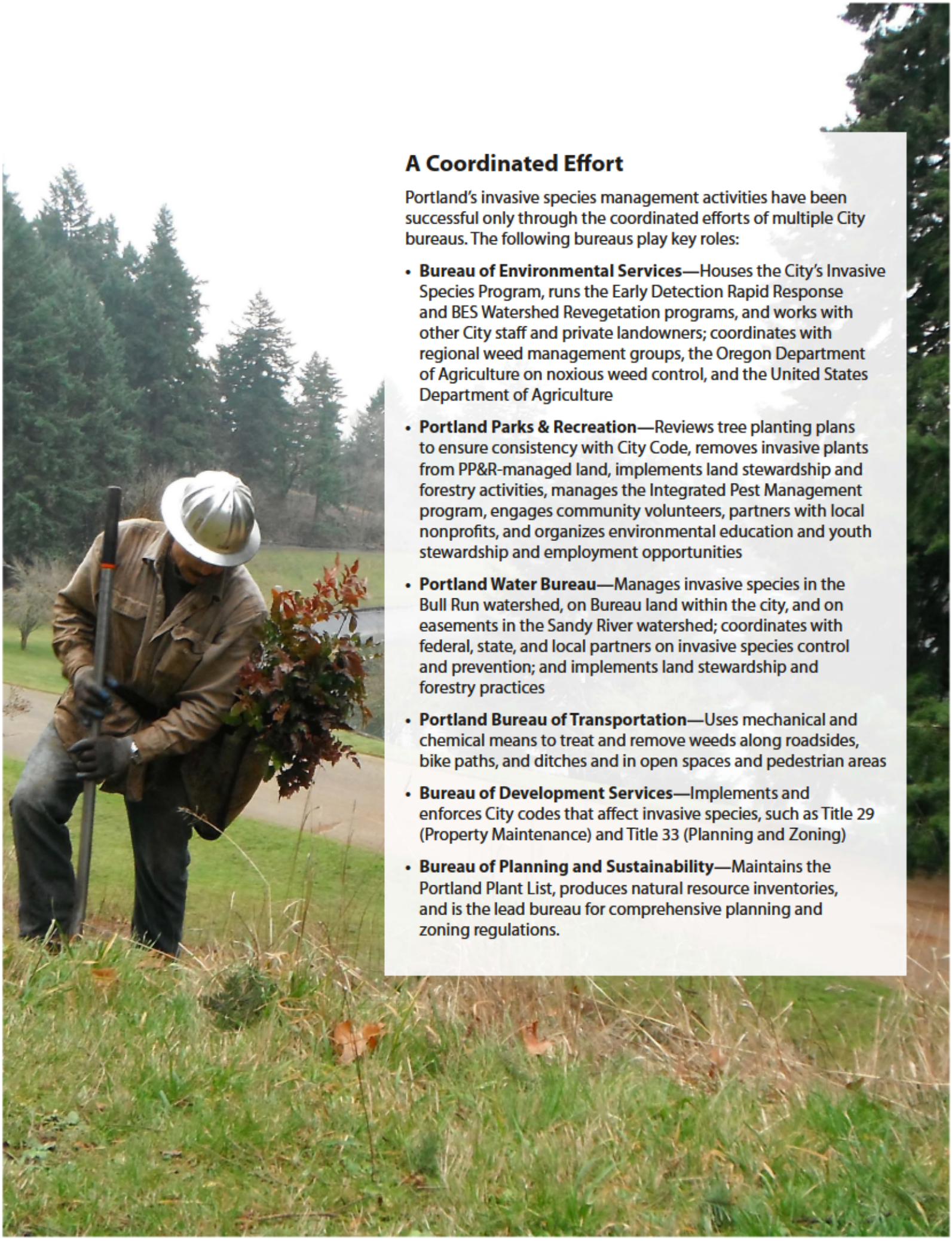
2 Retreatment is part the treatment continuum. Most areas affected by invasive species need both initial treatment and retreatment if they are to become ecologically stable.



A Coordinated Effort

Portland's invasive species management activities have been successful only through the coordinated efforts of multiple City bureaus. The following bureaus play key roles:

- **Bureau of Environmental Services**—Houses the City's Invasive Species Program, runs the Early Detection Rapid Response and BES Watershed Revegetation programs, and works with other City staff and private landowners; coordinates with regional weed management groups, the Oregon Department of Agriculture on noxious weed control, and the United States Department of Agriculture
- **Portland Parks & Recreation**—Reviews tree planting plans to ensure consistency with City Code, removes invasive plants from PP&R-managed land, implements land stewardship and forestry activities, manages the Integrated Pest Management program, engages community volunteers, partners with local nonprofits, and organizes environmental education and youth stewardship and employment opportunities
- **Portland Water Bureau**—Manages invasive species in the Bull Run watershed, on Bureau land within the city, and on easements in the Sandy River watershed; coordinates with federal, state, and local partners on invasive species control and prevention; and implements land stewardship and forestry practices
- **Portland Bureau of Transportation**—Uses mechanical and chemical means to treat and remove weeds along roadsides, bike paths, and ditches and in open spaces and pedestrian areas
- **Bureau of Development Services**—Implements and enforces City codes that affect invasive species, such as Title 29 (Property Maintenance) and Title 33 (Planning and Zoning)
- **Bureau of Planning and Sustainability**—Maintains the Portland Plant List, produces natural resource inventories, and is the lead bureau for comprehensive planning and zoning regulations.

PHOTO: NAIM HASAN PHOTOGRAPHY

Stewardship opportunities. The new strategy will expand outreach and education and create more opportunities for community stewardship.

	Original Invasive Plants Strategy (2008-2019)	Invasive Species Management for 2020-2030
Partnerships	Establishing partnerships with other bureaus, private landowners, nonprofits, and local, state, and federal agencies	Maintaining momentum with established partners; leveraging existing relationships to access federal and state funds and bolster the City's ability to control invasive species early on
Outreach and Education	Initial efforts	Expanded outreach and education; more stewardship experiences for historically underserved or underrepresented communities
New Features	✓ Citywide Invasive Species Program ✓ Programmatic efforts at PP&R and Water Bureau ✓ Updated Portland Plant List and associated administrative rules ✓ Invasive Plant Policy Review and Regulatory Improvement Project led to modification of City Code (Titles 11, 29, and 33)	✓ Asset management approach (i.e., treating green features as assets and managing them as such, with defined levels of service, etc.) ✓ Detailed analysis of pathways of introduction ✓ Goals and objectives based on gap analysis and current conditions ✓ Species prioritized by likelihood of arrival and potential consequences

Benefits of Effective Invasive Species Management

Now is the time to leverage previous investments—to allocate the resources needed to maintain what Portland has worked so hard to protect and restore. The benefits are multiple:

Cost Savings

Because invasive species can spread quickly, it is easier and cheaper to detect and remove them early on (or prevent them) than it is to eradicate them or engage in costly long-term control once they become established.

Additionally, letting invasive species damage Portland's natural areas would undermine the City's previous investments: in BES's planning, analysis, and on-the-ground work; in the Water Bureau's efforts to keep the Bull Run watershed free of invasive species; in PP&R's continued management of invasive species

For every dollar spent on early detection and control, it is estimated to save up to $35 by avoiding expensive future impacts.

— Oregon Department of Agriculture (2000), Economic Analysis of Containment Programs, Damages, and Production Losses from Noxious Weeds in Oregon

on 8,000 acres of forests and natural areas; and in partnerships the City has cultivated so as to be able to respond quickly to infestations and use cost-sharing arrangements to access federal and state dollars.

Community Benefits

All Portlanders benefit from having clean air, clean water, and recreational opportunities in ecologically healthy parks and natural areas. Yet new and existing invasive species threaten the City's ability to provide those services to the community, by undermining the health of local ecosystems. Additionally, invasive species have the potential to disrupt the water, stormwater, and wastewater infrastructure—both green and grey—that helps keep utility cost increases modest and predictable.

Some of the dollars that the City invests in invasive species management directly benefit community members, by providing job training and employment for teens (through the Youth Conservation Crew) and by engaging community members in volunteer stewardship activities that introduce them to natural resource work (mainly through PP&R's Natural Areas Stewardship program).

Protecting the Pacific Northwest

As a transportation hub for air, rail, shipping, and highway travel, Portland is Oregon's first line of defense against many invasive species. Each mode of travel represents multiple pathways through which invasive species can arrive from around the country (or the world) and then disperse to other parts of the Pacific Northwest. Portland has a responsibility to the rest of the region to go on the offensive with invasive species—to hold them back so they cannot spread and take hold throughout the state. Success requires strong partnerships with other local governments and organizations and state and federal agencies.

Cost-effective Protection of City Investments

The investments the City makes now will affect future success and the return on the City's previous investments in invasive species management and control. The appropriate level of capacity will depend on what the City wants to achieve in the next decade.

BES and PP&R have identified three potential funding levels for invasive species management from 2020 to 2030. Higher levels of spending address known gaps and shortfalls; expand capabilities, outreach, and partnerships; and offer better expected results and protection of the City's previous investments in its grey and green assets.

Unequal Impacts

Invasive insects and pathogens have the potential to decimate Portland's urban forest, which helps combat the urban heat island effect. Such a loss could disproportionately affect historically marginalized communities who tend to have lower amounts of tree canopy.

— *Growing a More Equitable Urban Forest: Portland's Citywide Tree Planting Strategy*
Portland Parks & Recreation.
www.portlandoregon.gov/parks/article/705823

What BES and PP&R achieve in the next decade will depend on how much the City invests now.

Option 1 Losing Ground	**Option 2** Addressing the Challenge	**Option 3** Ahead of the Curve	
The current funding level of $2.6 million pays for:			
✓	✓	✓	Portions of staff positions at Portland Parks and Recreation, Environmental Services, and Portland Water Bureau working on invasive species management and natural areas restoration.
✓	✓	✓	Operations and maintenance of some stormwater management facilities and natural areas
Additional $650,000 annually over Option 1 pays for:			
	✓	✓	All-species approach; adds animals (emerald ash borer, zebra mussels, quagga mussels, etc.), not just plants
	✓	✓	Enhanced coordination with state and federal entities (e.g., Oregon Departments of Forestry and Agriculture, USDA's Animal and Plant Health Inspection Service [APHIS], and U.S. Army Corps of Engineers)
	✓	✓	Bolstered capacity to control early invader species
	✓	✓	Current ecological function on 8,000 acres of PP&R-managed natural areas maintained or enhanced
	✓	✓	Survey and risk assessment of the City's green assets; recommendations for risk abatement based on an asset management approach
	✓	✓	Analysis of the risk that zebra and quagga mussels pose to the City's grey infrastructure
	✓	✓	Annual progress reporting
Additional $750,000 annually over Option 2 pays for:			
		✓	Analysis and recommendations for integrating green asset management into the City's asset management strategies and natural area management.
		✓	Improved ecological function on an additional 300 acres of PP&R-managed natural areas
		✓	Significant progress in achieving goals for City-owned natural areas as described in key natural resource management documents (*Portland Watershed Management Plan*[3], *Natural Areas Restoration Plan*[4], *Forest Park Desired Future Conditions*[5], *and Greater Forest Park Conservation Initiative* [6])

3 www.portlandoregon.gov/bes/article/107808
4 www.portlandoregon.gov/parks/article/323540
5 www.portlandoregon.gov/parks/article/335638
6 www.forestparkconservancy.org/conservancy/initiative

Option 1: Losing Ground

Funding, staffing, and activities remain at close to current levels, while threats and the risk of impacts from invasive species increase. The City continues to focus on only plants and operates reactively, waiting until infestations emerge and spread before taking action.

Total Funding

$2.6 MILLION ANNUALLY*

Expected Outcomes

- An overall decline in the City's ability to prevent and respond to infestations of invasive species
- Likely delayed response to local invasive animal infestations (such as mussels)
- Deterioration of a portion of 3,000 acres of PP&R-managed natural areas currently in fair condition; continued decline (toward failed ecological health) in areas that currently are in poor condition
- Potential for significant impact to Portland's urban forest and water/wastewater infrastructure
- A decline in watershed health conditions

Option 2: Addressing the Challenge

Funding pays for additional staff and more monitoring, detection, and on-the-ground actions to address both plant and animal species, including aquatic mussels. The City manages invasive species proactively, using its expanded surveying and assessment capabilities to monitor, detect, and quickly respond to invasive species; this reduces the likelihood of large-scale infestations. Cooperation with other entities is extensive, and federal and state agencies partner with Portland to address invasive animal species. The City continues its current education and outreach efforts.

Total Funding

$3.25 MILLION ANNUALLY*

Expected Outcomes

- Green and grey assets provide their current levels of function until an invasive invertebrate, such as the emerald ash borer or zebra or quagga mussel, becomes established
- More collaboration with federal, state, and local agencies
- City positioned for future funding and joint initiatives
- 4,000 acres of PP&R-managed natural areas maintained in their current healthy condition; 3,000 acres maintained in current fair condition
- Youth and community volunteers engaged in stewardship of natural areas at current levels
- Watershed health conditions maintained at current levels

Option 3: Ahead of the Curve

This option is similar to Option 2, but capabilities are significantly expanded, particularly in natural areas managed by PP&R. Additional funding pays for more extensive surveying and assessment, closer partnerships with public and private entities, more on-the-ground actions, and more extensive education and outreach, including to historically marginalized communities. Additionally, together with consultants, BES analyzes how to incorporate green assets into the City's asset management process.

Total Funding

$4.0 MILLION ANNUALLY*

Expected Outcomes

- Better functioning green assets, and thus healthier watersheds
- Reduced risk to both green and grey assets
- Green assets fully accounted for in City's asset management process
- 4,000 acres of PP&R-managed natural areas maintained in their current healthy condition and 300 acres improved from fair to healthy condition
- Higher numbers of youth and community volunteers engaged in natural area stewardship
- Goals for the City's natural areas met
- Improvements in watershed health conditions

*Funding options based in 2019 dollars.

Conceptual graph of watershed health improvements under different City funding options.

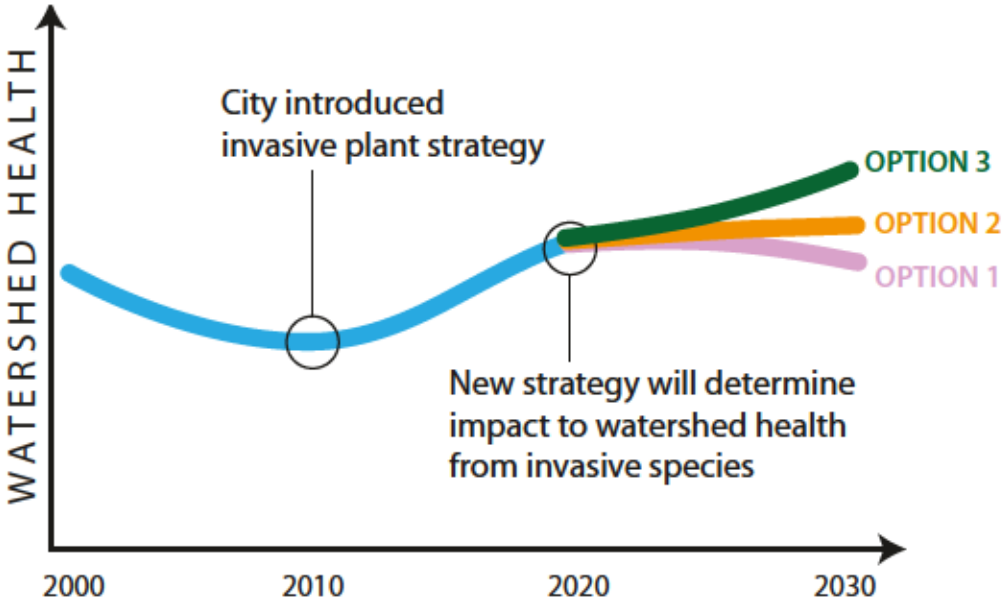


PHOTO: PP&R

Into the future. Future actions must protect previous investments to improve the health of Portland's forests and natural areas for all Portlanders, now and for generations to come.

Rising to the Challenge

Managing the invasive species that are on Portland's horizon will be a challenge—one that will require coordinated action, by multiple stakeholders, over time. But the City is ready. Past leadership has positioned Portland to keep invasive species in check over the next decade (just as it has in the past) and to identify new threats so they can be addressed.

With the right decisions now, the City can make the most of its previous investments, protect both its grey and green assets, prepare for climate change, and continue improving the health of its forests, natural areas, and communities well into the future.

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The City of Portland *Invasives 2.0, A Strategic Investment in Portland's Future* and *2008 Invasive Plants Strategy Audit* are the basis for the City's Strategy. Find links to these documents at www.portlandoregon.gov/bes/InvasiveSpeciesStrategy.

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