sprouts, and minor corrective or training pruning. Only 21% of trees are identified as needing more than the basic level of training pruning to produce a structurally sound tree. The final 6% of trees were considered cull trees, and training pruning would not be enough to ensure the structural quality of the tree that is conducive to the safety of residents, pedestrians, and roadway users. Most of these cull trees are already identified for removal in the 2016 tree inventory, showcasing the ability of the City of Des Moines to successfully recognize and manage roadway safety concerns.

The sample analyzed here is evidence that the current condition of young trees in Des Moines is on track to foster a healthy mature canopy. The 2016 tree inventory provides City managers with details for future maintenance needs that were consistent with those found in this analysis—further evidence that the City has a firm handle on current and future needs of their urban forest. With success in managing a structurally sound system, trees will be safer and more productive in the future. This only becomes more critical as trees grow in their size and potential for environmental, social, and economic benefits as well as in their potential for safety risks.

Maggie Harthoorn works as the Urban Forest Coordinator for Friends of Grand Rapids Parks.

SMA ROUNDTABLE:

Managing Natural Areas in the Urban Forest

Portlanders love their natural areas—and there are a lot to love! Our city's natural areas comprise over 10,000 acres (4047 ha) of Portland's landscape, the very fabric of our city. The green spaces are woven into the visual identity, intrinsic values, and core of what it means to be a Portlander. And Portland Parks & Recreation is the proud steward of this public land.

Green spaces make Portland a place where people want to build their lives, grow their families, and experience the intersection of city and nature. Portland voters have continued to support this quality of life, in part by voting for bond initiatives that dedicate funds to natural area acquisition. However, managing urban natural areas comes with many inherent challenges.

Portland's population is ballooning; it is projected to grow by 42% by 2035. As our population increases, so do the pressures on natural areas such as Forest Park. How we prioritize protecting and restoring the natural resource values of our urban natural areas while providing sustainable access for park visitors is the management challenge of the day.

Forest Park is a 5,200-acre (2104-ha) natural area in the heart of Portland. It is home to a diversity of wildlife not found in Portland outside of the Oregon Zoo. In the absence of fees and locked gates, it is challenging to limit or control the level of park use. The key is education that begins before people even arrive at the trailhead. As our population expands and the park's popularity increases, crowded trailheads are becoming the norm. Single-occupancy vehicle access cannot be the future. Exploring carpooling, ride-share, shuttle services, and other alternative modes of access is essential to encouraging sustainable access and preserving both environmental health and recreation experience.

Once visitors step foot on the trail, behavior is critical. For example, the way people and their pets utilize the park has both social and environmental repercussions. Whether small or large, all dogs are viewed by wildlife as predators. At the same time, much of urban wildlife is hidden and elusive so a dog walker may not be fully aware of their pet's impact. Birds that nest on or near the ground are particularly susceptible to harm by off-leash dogs. Fragile amphibians and reptiles rely upon clean, quiet water bodies—so a dog romping through the water can cause significant harm to wildlife. Furthermore, unscooped dog waste creates significant water quality hazards and human health risk.

At Portland Parks & Recreation we care for and provide sustainable access to our natural areas. This mission requires making daily management decisions that do not adversely impact the valuable resources we are trying to protect while providing enough access to educate and inspire park patrons and natural area stewards of the next generation. The future of our wild places hangs upon the balance between care and consumption, an awareness of the impact of our actions, and recognition that our walk alone in the woods is a gift we are borrowing from the future. >>

—James Allison, Land Stewardship Division Manager, City of Portland Parks and Recreation, Portland, Oregon

Forest Park in Portland is one of the biggest urban forests in the U.S. Photo courtesy of Portland Parks and Recreation

The Columbia, Missouri (pop. ~ 120,000) park system is comprised of 71 parks with over 3350 acres (1356 ha) of land. There are natural areas in almost every Columbia park, and nearly a third of the City's park acreage is officially designated either "nature park" or bufferland along destination trails and riparian stream corridors. Managing these natural areas is challenging, but a shift in community perspectives and changes in public policies has helped us move forward in addressing crucial natural resources issues.

One key lesson of natural area management that we learned long ago is that it is a losing proposition if we try and go it alone. Our Columbia Parks Department has worked diligently over the years to cultivate a myriad of partnerships to manage these natural areas, and it has been well worth it. A recent example of one of these valuable partnerships is our joint effort with the Science Teachers of Missouri (STOM) toward eradicating invasive bush honeysuckle (*Lonicera maackii*) from Columbia's parks. Columbia Public School District science teacher Mike Syzdlowski has organized numerous honeysuckle removal projects in Columbia parks to improve local woodland and habitat. These projects mostly involve high school and junior high students from the Columbia Public School District and serve as part of the students' curriculum on ecology and plant biology.

Our collaboration with Columbia public schools is also indicative of the growing community awareness that the natural systems that make up Columbia's urban ecology are a vital component of the municipal infrastructure that provides Columbian residents with innumerable social and environmental benefits. This community perspective was echoed by public policy in December, 2006 when the Columbia City Council initiated funding for a Natural Resources Inventory (NRI).

School kids in Columbia, Missouri participate in honeysuckle removal project. Photo by Mike Szydlowski

The Columbia NRI is a compilation of data, descriptions, and maps to document natural resources and attributes such as slopes, streams, soils, and vegetation. The collected data serves as a baseline reference to understand change and identify potential impact.

Controlled burn of prairie lands in Columbia, Missouri's Bonnie View Nature Sanctuary. Photo courtesy of Columbia Parks and Rec

When the NRI Review Draft was released in 2010, it listed several recommendations to help protect and preserve Columbia's ecosystem. Primary among these ideas was that the City should explore the advantages of implementing a "green infrastructure" approach to managing municipal stormwater, park, and open space resources. Integrating and coordinating the functions of these natural assets, it was reasoned, would promote sustainability and offer an efficient method of realizing environmental and cultural benefits from these resources.

Based on this common sense approach, in 2013 Columbia Parks and Recreation joined a multi-stakeholder partnership focused on creating an innovative open space/green infrastructure plan for the Columbia/Boone County area. The plan for this unique public-private partnership, called "Our Natural Legacy: A Plan for Columbia and Boone County," focused on quality of life and wellness issues, protecting community natural legacies, and identifying and prioritizing land parcels for conservation purposes.

The citizens of Columbia are highly vested in the sustainability and resilience of our community parks and natural areas. We know that if we listen to and continue to work with the citizens of Columbia, they will continue to support our parks department in our mission of enhancing and protecting Columbia's natural resources.

—Brett O'Brien, Natural Resources Supervisor, Columbia, Missouri

Bonnie View prairie lands in spring, after regenerative burn. Photo courtesy of Rick Shaw and the Missouri Drone Journalism Project

Bonnie View in high summer. Photo courtesy of Columbia Parks and Rec

This definition of park natural areas guides our understanding of urban forest natural areas for the sake of this Roundtable. It's from the City of Surrey, BC's award-winning Natural Areas Management Plan.

"Park natural areas are defined as parks or areas of parks that are relatively undisturbed, that contain a high percentage of native plant species, and that provide considerable habitat for indigenous wildlife. They are natural or near natural in character or are in the process of recovery from human disturbance. They help to maintain the diversity of living organisms through the conservation of wild genetic resources. Compared to cultured and manicured park areas, they require less routine and less intensive management activities to ensure their sustainability; however, they also require active management due in part to their location within a highly urban setting."

Managing Natural Areas in
New York City

Please see "*Kristy King and NYC Forest Restoration: Dreaming Big for the City's Natural Areas*" on the New York State Urban Forestry Council blog.

Story continues on the following page >>

The City of Surrey (population 520,000) is one of the fastest growing cities in Canada, having added almost 1,000 residents each month for the last thirty years. The city is bordered on the south by the United States, by the Fraser River on the north, and by the Pacific Ocean on the southwest side. Surrey's coastal climate is characterized by cool rainy winters, mild sunny summers, and cool autumns—conditions that allow temperate forests to thrive. There are three healthy fish-bearing rivers running through the city, and many creeks that support spawning salmon and trout. Thirty-five percent of Surrey is made up of an agricultural reserve that cannot be developed for housing or industry—but which has several nature parks within it.

The Surrey park system contains 1,629 ha (4025 acres) of natural areas that include mature deciduous and coniferous forests, old field habitat, marshland, a river mouth sand-spit, and some old-growth forest. Natural area parks are increasing in size every year in Surrey, based on an acquisition target of .8 ha (2.0 acres) for every thousand new residents. Based on this formula, and with additional lands provided through gifts of property to the park system, Surrey has acquired an average of 23 ha (57 acres) of new natural areas in each of the last five years. These new natural area lands are helping to preserve riparian areas and other important habitat within the city as development occurs.

Surrey manages its natural areas within the guidelines set out in the *Natural Area Management Plan: Strategic Directions* (the Plan). The Plan was developed with significant citizen input from two urban forest advisory committees and several non-profit groups invested in the preservation of Surrey's natural environment. The Plan is built on the cornerstone management principles of:

i) Sustainability;

ii) Citizen Access; and

iii) Communication amongst Stakeholders

Providing beaver protection for Surrey's mature and significant trees.

Green Timbers Lake in the heart of the City of Surrey, BC.

The Plan encompasses a number of management themes that include:

- Preservation and Protection
- Accessibility
- Community Participation
- Education
- Health, Safety, and Liability
- Aesthetics
- Preservation of Property Values and Economic Development
- Cost Effectiveness; and
- Biodiversity Conservation

To meet the objectives of the Plan, seven distinct strategies have been developed and are utilized in carrying out maintenance and development activities within Surrey's extensive natural areas. These strategies are:

1. **Vegetation Management** – This includes control of invasive species, bi-annual mowing in old-field habitat, under-planting of early seral stage deciduous forests with conifers, placing beaver-deterring wrap on significant trees, and opening up sight-lines on trails in key areas through selective pruning.
2. **Fauna Management** – Wildlife trees are created and managed, bat and bird boxes installed, amphibian "houses" created, and dogs prohibited in some areas to prevent wildlife harassment.
3. **Access and Recreation Management** – A hierarchy of trails has been developed to manage pedestrians and bicycles. In some instances, areas are fenced to completely preclude access. Trails vary in design from narrow, low environmental impact trails to wide, gravelled multi-purpose pathways. Boardwalks with interpretive information are present in some areas to assist the physically challenged, including areas where people in wheelchairs and those with vision problems can get up close to forest elements. Bicycle features are built and maintained in partnership with off-road cycling enthusiasts.
4. **Tree Hazard Management** – In keeping with prudent risk management principles, forest areas that are adjacent to trails, parking lots, and other City infrastructure are evaluated on a scheduled basis, with hazard mitigation work carried out as necessary. An on-demand inspection and mitigation program is in place, and the Natural Areas Team responds after major wind events.
5. **Fire Management** – Interface fire management plans are in place, with pro-active fuel mitigation work carried out by Natural Area staff. Close integration with the Fire Department's Wildland Fire team has the Fire Department carrying out initial suppression activities, with Natural Area staff performing mop-up and site rehabilitation work.
6. **Coarse Woody Debris Management** – Recognizing the value of coarse wood debris to healthy forest ecosystems, logs, large branches, and other materials are strategically left during maintenance and development activities. In some cases, coarse woody debris is brought into natural area sites and into riparian areas that are bereft of larger logs and stumps.
7. **Yard Waste and Refuse Management** – In addition to the poor aesthetics associated with the dumping of yard waste and other refuse into natural areas, these illegal activities introduce deleterious materials and invasive plants into otherwise healthy ecosystems. Prompt clean-up and education are key elements of this strategy.

Pond in Surrey's Godwin Biodiversity Preserve.

In order to educate the public about the value of natural areas, the City operates the Surrey Nature Centre, which is located within a large urban forest in the middle of Surrey. The Nature Centre allows adults and children to explore nature through the offering of various indoor/outdoor drop-in activities and registry-based programs that provide hands-on experiences, many of which are linked to school curricula.

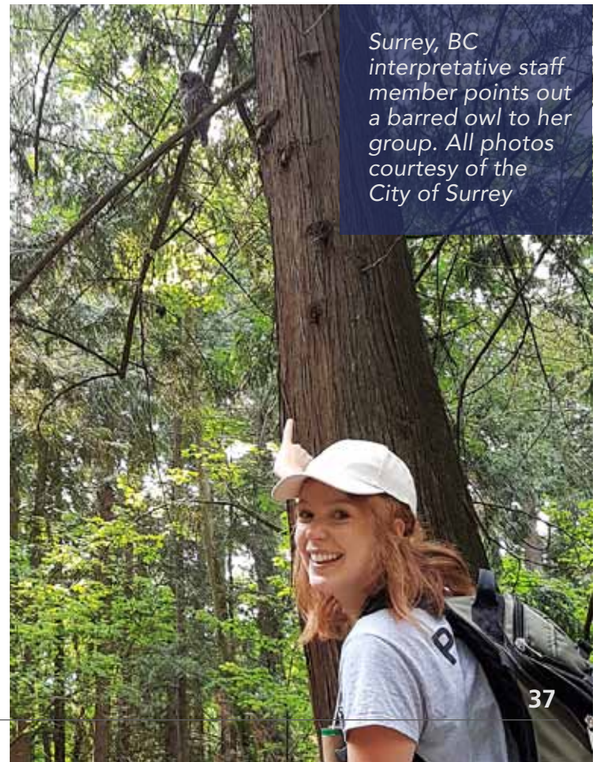
Surrey works hard to provide environmentally-related volunteer opportunities for its residents. Programs such as the Surrey Youth Stewardship Squad (Ages 13-17) allows youth to come together to carry out environmental projects. This program gets youth involved in habitat restoration and assisting in environmentally-related community events that raise awareness about the value of natural areas. Surrey's Friends of the Forest registers nature-lovers for work parties that are aimed at removing invasive vegetation, planting native trees, monitoring wildlife, and preserving park ecosystems.

The Surrey Natural Areas Partnership (SNAP!) was developed almost two decades ago to provide additional support to two very large natural area urban forests. The partnership consists of three non-profit organizations and the City of Surrey. The non-profit groups are very successful in soliciting grants for natural area management programs and carry out the administrative aspects of the partnership. The City provides additional funding and close direction to SNAP employees (usually students) who carry out maintenance work and community education in the City's urban forests.

In order to effectively manage Surrey's natural areas, a Natural Areas Team was put together in the year 2000, reporting to the Surrey Urban Forestry Manager. Staff on the team have a variety of academic backgrounds in areas such as Environmental Education, GIS, Forest Resource Management, Forest Conservation, Fish and Wildlife Biology, and Arboriculture. In addition, all of the operations staff working in this section are ISA Certified Arborists and most are Qualified Tree Risk Assessors.

The City of Surrey's natural areas are in good hands!

—Owen Croy, former City of Surrey Manager of Parks, and Robin Landucci, Urban Forestry Manager, City of Surrey, British Columbia



Surrey, BC interpretative staff member points out a barred owl to her group. All photos courtesy of the City of Surrey