During the 2015-2016 biennium, restoration activities in Mercer Island’s open space areas were accomplished by in-house staff, professional restoration contractors, and volunteers. Activities included invasive plant removal, invasive tree treatment, ivy ring creation, fall planting, and watering of select planting sites. In addition, staff performed extensive work on tree risk assessment and noxious weed management.

This report covers the first biennium of the program’s performance guided by the Ten-Year Evaluation and Update. A troubling trend is emerging in the current biennium. Rapid inflation in restoration contracting and the stagnant capital budget have created a shortfall in services to the open space. In 2017, the program will not be able to fully maintain the work areas previously established.

BACKGROUND
The Open Space Program in the Parks and Recreation Department has been managing natural areas within Mercer Island parks since 2005. This program controls invasive species, plants native trees and shrubs, coordinates volunteer restoration events, and manages tree risk on over 300 acres of open space area. The program follows the goals and objectives from three planning documents:

- 2004 Open Space Vegetation Plan
- 2008 Forest Health Plan (specific to Open Space Conservancy Trust Properties)
- 2015 Open Space Vegetation Plan Ten-Year Evaluation and Update

The 2015 Ten-Year Update showed considerable progress in restoring health of the Island’s natural areas: conifer plantings are establishing well as future forest canopy, invasive plant cover has been substantially reduced, and English ivy control has effectively reduced severe infestations into tree canopy. The report also pointed to the need for continued, concerted efforts in reducing invasive tree species, planting young
trees, and controlling aggressive understory species. The 2015-2016 Biennium Report covers the first biennium of work guided by the Ten-Year Update.

Between 2005 and 2010, funding for the Open Space Program increased steadily, driven by Council’s interest in raising the level of service for all open spaces, as well as a voter-approved levy in 2008. These funding increases, paired with an advantageous bidding environment during the economic recession, greatly advanced restoration work in open space areas. Since 2009, funding for the program has remained relatively level.

**2015-2016 OPEN SPACE WORK**

In 2015-2016, the Open Space Program continued to accomplish restoration activities in the parks’ natural areas through in-house staff and seasonal crew labor, restoration contractors, and volunteer efforts. Restoration activities were similar to previous biennia: invasive species removals, invasive tree and noxious weed treatment, tree ivy removal, native tree and shrub planting, and select watering of new plantings. Work spanned across 110 (net) acres in 20 parks and open spaces, with many areas receiving multiple restoration activities. Approximately 6,800 new trees and shrubs were planted in ten of those parks.

Overall, restoration metrics were down from recent biennia: fewer new acres were enrolled in restoration work, fewer total acres received restoration work, and fewer plants were installed. Planned work in Pioneer Park, laid out in the 2008 Forest Health Plan, also fell behind targets: work on invasive trees slated for 2015-2016 was postponed due to budget constraints, and tree planting efforts were slowed by high mortality resulting from summer drought.

Volunteers continued to provide significant contribution through public, school, and corporate restoration events. Islander Middle School continued to partner with the City and EarthCorps to bring 300 sixth-grade students into Pioneer Park each year, and Youth and Family Services’ VOICE program participated in several events each summer.

During this biennium, Open Space staff created a more systematic approach to assessing tree risk along park boundaries and primary trails. Using a smartphone app and GIS, all assessed trees are mapped with detailed data, which is used to schedule contracted tree pruning, removals, and monitoring. As a result of this new assessment protocol, a larger portion of Open Space funds was put toward initial assessments and contracted tree work.

**2017-2018 WORK PLAN**

The priority for the 2017-2018 biennium is to maintain park land that has already been enrolled in restoration. Due to the combination of increased restoration costs and budget reductions, not all areas in need of maintenance will receive restoration work in this biennium. Following the management recommendations from the Ten-Year Update, staff will continue to prioritize maintenance on sites considered most sensitive and ecologically valuable. In addition, the program will not have adequate funds to initiate comprehensive invasive removal projects, and planting projects will likely be limited to volunteer efforts.

The Open Space Program will continue working with EarthCorps and Mountains to Sound Greenway to engage community volunteers in restoration and fostering relationships with individuals interested in more intensive Forest Stewardship.

**CHALLENGES AND IMPLICATIONS**

During the 2015-2016 biennium, the Open Space Program experienced a significant shift in restoration output due to several factors: unit costs for restoration tasks increased sharply over previous biennia and contractor availability/interest decreased as other agencies began to implement large-scale restoration projects. Unit costs for basic tasks, such as ivy ring creation and planting maintenance, increased between 2- and 11-fold. Additionally, restoration contractors began to report that the low-bid system used by Mercer
Island is a deterrent, as it can be more restrictive and onerous than time-and-materials contracts used by other agencies. As a result, project costs increased substantially in 2015-2016.

In 2017-2018, few contractors are responding to Requests for Bid and the prices being quoted represent another jump in program costs. As a result, some projects that maintain previous restoration work have been dropped or postponed in this biennium’s workplan. No new restoration project areas or plantings will occur in this biennium either.

NEXT STEPS
For the 2017-2018 biennium, Open Space staff will continue to prioritize the most ecologically sensitive areas for restoration - especially those in which a lack of maintenance may result in a drastic setback in restoration progress. Due to rising costs, current funding does not fund maintenance of all previous restoration projects. To restore funding to a “maintenance-only” level, staff will first re-direct savings on other Parks capital projects before seeking additional funding from the General Fund or REET surplus, if any.

Parks staff has begun exploring possible solutions to funding shortfalls in 2019 and beyond in order to ensure that progress on open space restoration continues. Possible avenues include an expanded use of herbicides to treat invasive species, a shift to more in-house crews performing the work, and proposing funding needs in an operating or capital levy lid lift. Such solutions will require planning and/or public outreach and cannot be effectively implemented in the current biennium.

RECOMMENDATION

Parks Natural Resources Manager

MOVE TO: No action necessary. Receive the report.
PROGRAM BACKGROUND

Mercer Island Parks and Recreation has been managing 300+ acres of open space with its capital program since 2005. Invasive plant removal, tree planting, and other stewardship activities have improved the function of the forest ecosystem and engaged citizens in the process. A ten year program update published in 2015 showed that invasive plant cover had been cut in half and native conifer regeneration was markedly improved as well. The ten year update added climate resilience as a program goal. A number of program modifications and new initiatives were proposed to further the program goals:

1. Maintain the functional benefits of open space vegetation.
2. Foster resilient plant communities that can recover from disturbances and adapt to climate change.
3. Implement work based on the value of these functional benefits, the community’s priorities for the open space properties, and the condition of the vegetation found there.
4. Maximize the return on available funding through volunteers, matching grants, and donations.

Program enhancements included: improved restoration techniques, a climate adaptation plan, ravine and watercourse stabilization, and public education and involvement. The highly successful public campaign to control knotweed has been one outcome of the enhanced open space program. Another change to the program in 2015-2016 was the transition to a systematic approach to tree risk assessment in open space. This important development is described in further detail below.

This report covers the first biennium of the program’s performance guided by the ten year update. A troubling trend is emerging in the current biennium. Rapid inflation in restoration contracting and the stagnant capital budget have created
a shortfall in services to the open space. In 2017, the program will not be able to fully maintain the work areas previously established. Furthermore, no progress will be made on any of the climate adaptation plan initiatives. These trends will be discussed in more detail in this report.

**2015-2016 BIENNium OVERVIEW**

During the 2015-2016 biennium, restoration activities were accomplished by in-house staff, non-profit partners EarthCorps and Mountains to Sound Greenway, and professional restoration contractors. Activities included invasive plant removal, invasive tree treatment, ivy rings, fall planting, watering of select planting sites, and noxious weed management. Contractors conducted restoration on 110 acres in 20 parks. Maintenance activities account for 95 acres and new sites enrolled in restoration for the first time account for 15 acres. Contracted crews and volunteers planted 3,559 trees and 3,315 shrubs in 10 parks.

### OPEN SPACE ACCOMPLISHMENTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Total acres worked</th>
<th>Trees planted</th>
<th>Shrubs planted</th>
<th>Ivy survival rings</th>
<th>Volunteer events</th>
<th>Volunteers</th>
<th>Volunteer hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06</td>
<td>88.3</td>
<td>3,799</td>
<td>N/A</td>
<td>2,233 rings</td>
<td>125</td>
<td>1,312</td>
<td>2,260</td>
</tr>
<tr>
<td>2007-08</td>
<td>99.2</td>
<td>2,407</td>
<td>2,066</td>
<td>30.4 acres</td>
<td>92</td>
<td>2,089</td>
<td>8,371</td>
</tr>
<tr>
<td>2009-10</td>
<td>204</td>
<td>12,947</td>
<td>2,027</td>
<td>37.4 acres</td>
<td>109</td>
<td>4,148</td>
<td>13,547</td>
</tr>
<tr>
<td>2011-12</td>
<td>139</td>
<td>5,705</td>
<td>3,027</td>
<td>21.5 acres</td>
<td>114</td>
<td>6,496</td>
<td>12,684</td>
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<tr>
<td>2013-14</td>
<td>149.7</td>
<td>6,574</td>
<td>4,470</td>
<td>62.4 acres</td>
<td>101</td>
<td>3,104</td>
<td>13,008</td>
</tr>
<tr>
<td>2015-16</td>
<td>110</td>
<td>3,559</td>
<td>3,315</td>
<td>18.3 acres</td>
<td>94</td>
<td>3,040</td>
<td>10,065</td>
</tr>
</tbody>
</table>

### CONTRACTED RESTORATION WORK

In 2015-2016 contracted crews conducted invasive plant removal to maintain new planting sites as well as upkeep of sites in which comprehensive invasive removal had cleared the majority of invasive species. Additional tasks included ivy ring creation to protect mature trees, as well as invasive tree treatment primarily targeting English holly, cherry laurel, and common hawthorn.

Comprehensive invasive plant removal projects were completed on 7.7 total acres in high value habitat within Engstrom Open Space, Island Crest Park, North Mercerdale Hillside, SE 53rd Open Space, and Wildwood Park.

During the 2015-2016 biennium, the Open Space program continued to implement the Pioneer Park Forest Health Plan, adopted by the Open Space Conservancy Trust Board in 2009. Pioneer Park received the following restoration treatments: Fall planting (2.4 acres), planting maintenance (18.4 acres), invasive removal maintenance (2.6 acres), ivy rings (4 acres), and watering of new plantings (10 acres). An additional 14.4 acres of trees and shrubs were installed on difficult sites that had high plant mortality the previous biennium.

Overall, implementation of the Forest Health Plan has slowed compared to previous biennia, but is overall on track. The plan called for 16 acres of new tree plantings, but as noted above, most native plant installation focused on replanting sites that had high mortality during the 2013-2014 biennium. Despite this, tree planting remained on schedule during the 2015-2016 biennium with 68 cumulative acres planted since 2009. Ivy ring creation is slightly ahead of schedule with 51.5
acres completed. The Open Space program was unable to launch the second round of invasive tree treatments, due to budget constraints and an increase in professional contracting costs.

NATURAL RESOURCES SEASONAL CREW
The Natural Resources seasonal crew is tasked with supporting both vegetation management as well as trail maintenance and repair. Restoration work conducted by the crew during the 2015-2016 biennium included monitoring and treatment of noxious weeds such as jewelweed, knotweed, yellow flag iris, and yellow archangel as well as manual removal and treatment of invasive trees. Seasonal crewmembers also support volunteer stewardship projects with mulch deliveries and site preparation where needed.

VOLUNTEER FOREST STEWARDSHIP
In 2015-2016, EarthCorps and Mountains to Sound Greenway (MTSG) managed 94 events in 13 parks. They engaged 3,040 volunteers who worked just over 10,000 volunteer hours. Volunteer forest stewardship continues to be a vibrant component of the Open Space program. In addition to the important field work accomplished through this program, volunteer stewardship strengthens our community, engages and educates the public, and supports the City’s efforts to create resilient healthy forested parks and open spaces.

KNOTWEED CONTROL PROGRAM
In addition to the many noxious weed species that Natural Resources staff map and treat within Mercer Island parks, the Open Space Program also began to map, sign and treat invasive knotweed on all City-owned properties in 2013. Natural Resources staff posts signs to alert Public Works staff and homeowners to avoid mowing knotweed along road edges, and performs all herbicide treatments on the species. This program also performs community outreach and education about identification, ecological damage, and effective control options for homeowners.

Work on this program continued in 2015-2016, and has been very effective. Open Space staff is currently tracking 104 distinct populations of the noxious weed on roadsides and in parks. Many populations have now been successfully controlled, while Mercer Island residents continue to report new sightings both on public and private land.

TREE RISK ASSESSMENT PROGRAM
In late 2015, the Natural Resources team adopted a comprehensive, proactive approach to assessing risk on trees along park and open space

Figure 2. Volunteer group working with EarthCorps leader, Island Crest Park, 2016.

Community stewardship events were held in various parks on Saturdays throughout the year. We continued our partnership with Islander Middle School and

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Figure 3. ArcCollector smartphone interface, showing assessed tree locations. The same application is used for mapping noxious weeds.
boundaries, replacing a system that was more reliant on citizen reports and piecemeal assessments. The new protocol includes collecting detailed information and GPS location of each assessed tree, tracking trees with specific monitoring needs, establishing a re-inspection interval based on site conditions, and noting which trees require pruning or removal in the near future. When removal or pruning are deemed too technical for City crews, the work is put out for bid to private contractors. In 2015-2016, staff on the Natural Resources team assessed 6.5 miles of the total 11.5 miles of park boundary.

As a result of this increased inspection regimen, the allocation of Open Space funds to tree removals and pruning has seen a marked increase. Tree work costs will likely remain high through 2017 and 2018, as all boundaries are assessed for the first time, and removal and corrective pruning are performed.

This methodical approach to tree risk assessment and abatement has reduced the amount of tree failures along park edges. This was evident after the February 2017 snowstorm, when staff found very few failures along assessed boundaries.

2015-2016 FUNDING USE ANALYSIS

- In the 2015-2016 biennium, just under half of the Open Space budget was allocated to restoration contractors to perform tasks in open space areas. This work was scoped by staff, and awarded to the lowest qualified bidders on a per-park basis. Most contracts covered two years of work.

- The majority of funds allocated to professional services pay for contracts with EarthCorps and Mountains to Sound Greenway Trust, non-profits that organize and lead volunteer events in natural areas.

- Restoration work is also performed by the Natural Resources crew, a 6-month seasonal crew whose hours are shared between the Open Space program and the Trails program.

- Contracted tree work, which covers professional pruning and removals, cost approximately $78,000, or 9.3% of the total budget.

- The project management portion of the expenditure covers all year-round staff that contribute to Open Space work, including restoration scoping and contract management, tree assessments and contracting, and Open Space Conservancy Trust Board responsibilities.

2017-2018 BIENNIAL WORKPLAN

The focus of the 2017 work plan is to maintain existing restoration projects and conduct activities to preserve existing forest canopy. These activities include maintaining recent planting sites, invasive removal maintenance, ivy rings, and invasive tree treatment. Due to budget constraints and the rising costs of professional restoration contractors, the Open Space program will not be initiating comprehensive removal projects or large scale planting projects. Planting projects will
be conducted only in volunteer sites. The program does not want to lose ground on the important projects already underway across the City.

Looking ahead to 2018, the program will prioritize areas in need of maintenance that do not receive work in 2017 and continue to invest in projects that preserve existing canopy and native tree installations.

PROGRAM CHALLENGES
The Open Space program has made significant impacts on the health of Mercer Island forests since its inception in 2005. Each year, contractors, volunteers, and staff work to remove non-native plants that have invaded the Island’s natural areas, and plant thousands of native trees to replace declining tree canopy. Since 2005, the Open Space program has steadily added new acreage to the restoration work plan, focusing on preserving high quality habitat, retaining existing tree canopy, and planting trees for future canopy.

Between 2009 and 2012, the program made substantial progress on the restoration agenda, due to low bids from contractors and lower regional demand for qualified restoration contractors. In 2015, the climate in the restoration field began to change: unit prices for restoration tasks began to rise significantly, and contractor availability became a hurdle as other municipalities and utility agencies began funding large scale restoration programs. This surge in unit prices for invasive species removal tasks can be seen in Figure 5. Invasive knockdown costs, for example, increased from just over $1000/acre to over $9000/acre between 2013 and 2017. Comprehensive removal, the task in which all invasive species and their roots are removed, increased to $14,700/acre in this year’s bids, rendering this task cost prohibitive. In several municipalities, including Seattle and Portland, this extraordinarily high cost for manual removal has contributed to a move toward chemical treatment of all invasive species. Currently, the Mercer Island Open Space Program uses chemical treatment specifically for invasive tree species and select noxious weed species.

The cost for plant installation also increased (Figure 6), though far less than the 400% increase in planting maintenance unit cost between 2011 and 2017.

Figure 5. Invasive species removal costs per acre, based on average annual bids received.

Figure 6. Planting costs per acre, based on average annual bids received. Planting costs do not include plant materials.
FUNDING HISTORY

The Open Space program is funded as a Capital Improvement Project, primarily through REET 1 funds. In 2008, Mercer Island residents voted to supplement existing funding for the Open Space program with a 15-year levy. Beginning in 2009, $77,000 per year is allocated specifically to restoration in Pioneer Park, and $65,000 per year is allocated to restoration work in all other open space areas on the island. This $142,000/year levy contribution does not increase with inflation.

Figure 7 shows six-year funding plans that have been established as part of each biennial budget. In the 2015-2016 budget (2015-2020 Plan), funding was reduced by $50,000 per year, then later restored for 2015 and 2016 with surplus from the 2014 General Fund. In the 2017-2018 budget, funding was again reduced by $50,000 per year. The black line in the graph represents actual funding for the Open Space program on an annual basis. At $444,000, approved funding in 2017 is equal to the funding level in 2010.

The gray line in Figure 7 represents annual Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) inflation of the non-levy portion of the Open Space budget. As an industry based largely on manual labor, restoration is expected to most closely follow a wage-based inflation rate, such as CPI-W. However, as noted earlier, the current bidding climate indicates that restoration unit rates are being driven steeply upward by regional demand, and are rising much more quickly than indicated by the CPI-W.

IMPLICATIONS

During the 2017-2018 budget process, the assumption was that a $50,000/year reduction in funding for the Open Space program would prevent any new areas from being enrolled in restoration activities, but that funding would remain adequate to ensure that all previously enrolled restoration areas would receive maintenance. However, based on bids for 2017 work, it is clear that the current budget will not be sufficient to address maintenance needs. While restoration areas with the highest habitat value will be prioritized for maintenance, invasive species maintenance on others will be postponed. The implications on the ground are varied: in some areas, a lack of maintenance will result in regrowth of invasive species, while in others, a lack of ‘maintenance’ prevents the cycle of restoration from continuing on schedule. In 2017-2018, scheduled native tree planting will be postponed in order to avoid costs associated with planting, plant materials, watering, and planting maintenance. The postponement of tree planting represents a significant departure
from the Open Space Vegetation Management Plan, where planting is identified as a central component of retaining and replacing declining tree canopy in Mercer Island Parks.

The current Open Space Program’s scope of services includes several distinct components:

- ecological restoration of natural areas
- well-established volunteer program
- noxious weed control (including the City-wide knotweed program)
- tree risk assessment and abatement program

Given that restoration costs are likely to continue on an upward trend, the Open Space Program now faces decisions about how the limited funding should be used to most efficiently and effectively achieve its goals. Should City funding remain relatively flat, or even rise to meet average wage-based inflation, the gap between program funding and ‘maintenance-only’ restoration is likely to widen. The City is currently considering taking a levy to voters in 2018, which could include additional funding for the Open Space program.

Adjusting the Open Space Program to fit within the budget constraints will require changes to the current scope of work. Possible alterations may include limiting or eliminating work associated with the tree assessment or knotweed control programs. Another option may be to move from labor intensive manual removal of invasive species on forested land to increased chemical control, similar to methods that have been adopted in other urban restoration programs. Such chemical control may provide the additional benefits of requiring less follow-up maintenance and/or releasing native species from the soil seedbank, with less soil disturbance. A third option would prioritize maintenance in particularly high value open space areas, and remove other acreage from further restoration activities. The ten-year update provided guidance on such prioritization, indicating that certain areas of open space provide particularly high value habitat and contribute to erosion control and stormwater buffering:

- Riparian, shoreline and other wet areas
- Areas with mature or old-growth trees
- North-facing ravines

If additional funds are made available to the Open Space Program in the next biennium, these sites would continue to be prioritized. However, areas which had received previous restoration activities would be restored to the maintenance cycle (to the extent that funding allows), in an effort to minimize the loss of previous restoration investment on these sites.