

## 23. Appendix M: Pioneer Park and Engstrom Open Space Fire Management Plan

### 23.1 Introduction

Pioneer Park and Engstrom Open Space are susceptible to forest fires of natural and human origin. The risk can be partially managed by planning for an occurrence and intervening to mitigate risk factors before such an occurrence. This plan does both within the constraint of preserving the native forest on Trust properties and using the resources currently available to the City of Mercer Island. The goal of this plan is to guide City departments to better protect Pioneer Park, Engstrom Open Space, and the surrounding neighborhood from fire. It begins by assessing current resources and proposing certain goals for fire management, then describes actions for mitigation of risk factors and improving response to fire occurrences.

### 23.2 Definitions

- **Automatic Aid:** Recourses that are pre-determined and automatically dispatched for incidents outside of their jurisdictional boundaries.
- **Brush Unit:** Any light, mobile vehicular unit with limited pumping and water capacity.
- **Handline:** Hose lines that are less than 2.5" in diameter used for fire extinguishment.
- **Mutual Aid:** Pre-determined resources that are mutually used across jurisdictional boundaries.
- **Incident Command:** A standardized on-scene emergency management concept specifically designed to allow its users to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.
- **Incident Commander:** An individual who is properly trained and currently assigned to the overall supervision of an incident.
- **Inter-mix Areas:** The area undergoing a transition from agricultural and forest uses to urban uses.
- **Structure Engine:** A fire apparatus designed to carry tools, supplies, water, and pump capable responding to and mitigating structure fires.
- **Supply Line:** Larger diameter hoses designed to supply large amounts of water to/from pumps to smaller fire suppression hose lines.
- **WUIC:** Wildland Urban Interface Code.

### 23.3 Resource Assessment

#### Firefighting Resources

The Mercer Island Fire Department (MIFD) would be the first response to fire occurrence. MIFD has seven firefighters stationed on the island at any one time. Three are located at Fire Station 92, which is located on the south side of SE 68<sup>th</sup> St, across from Pioneer Park's NW Quadrant.

The remaining firefighters are located at Fire Station 91, located approximately 3 miles north of Pioneer Park. Either station might respond to a fire based on the battalion's availability. The Incident Commander would make the decisions about fighting a fire based on the situation.

Washington State Department of Labor and Industries allows firefighters in structural protective clothing to work a maximum of one hour on a wildfire (WAC 296-305). First response by on-duty staff could be followed by calling out for mutual aid from adjacent jurisdictions. If required, off-duty staff could be called to report for duty as the Incident Commander deems necessary, and dependent on the duration of the incident.

Mutual aid agreements with other jurisdictions allow MIFD to request fire units from other fire departments. Bellevue, Kirkland, Woodinville, Redmond, Seattle and Eastside Fire and Rescue have resources that would be useful for wildland fire fighting; these Departments have firefighters who are wildland firefighting certified ("Red Card") to fight this type of fire, and who would respond under a mutual aid request. These resources would likely be needed depending on the extent of a fire.

Washington State Department of Natural Resources (DNR) also has the capability to fight wildland fires. They may be called in, if necessary, when local and mutual aid resources are exhausted. DNR offers many resources most fire departments do not have, such as inmate crews, wildland engines, and experienced overhead (aerial) support.

### **Hydrants and Hose Access**

Pioneer Park and Engstrom Open Space have fire hydrants along the perimeter roads. Other boundaries also have hydrants available through private property. Hose that is normally used in structural firefighting is too bulky and cumbersome to be used in wildland firefighting, but can be used to maintain and support the supply of water to smaller handlines. MIFD has 600 feet of wildland hose (single jacket, lightweight) specific to wildland firefighting available and 1000 feet of 4" traditional structure hydrant supply line for hydrant hook-up on each of its units.

However, topography and trail access reduce the actual distance that water can be conveyed into the park by fire hose. Realistically, 500 feet is the maximum distance that water can be reliably conveyed into the park using conventional tactics. While it is possible to extend the 500 feet further, additional resources and personnel would be needed. Figure 1 illustrates that center of each quadrant and some parts of the ravine in the Northeast quadrant are more than 500 feet from an available hydrant, leaving significant areas of the park without access to water in case of a fire. During these situations other tactical options should be considered such as hand crews and helicopter operations.



Figure 1: Map showing hydrant locations and coverage in Pioneer Park and Engstrom Open Space.

### 23.4 Goals and Priorities

Common fire mitigation strategies used in dry forests, such as thinning or understory clearing, do little to mitigate fire risk in the dense, fuel-rich forests of western Washington<sup>1</sup>. In naturally high-biomass ecosystems like Pioneer Park and Engstrom Open Space, the most effective approaches to mitigating fire risk are to 1) minimize ignition sources, 2) quickly detect and

1. Joshua S. Halofsky et al., "The Nature of the Beast: Examining Climate Adaptation Options in Forests with Stand-Replacing Fire Regimes," *Ecosphere* 9, no. 3 (March 2018): e02140, <https://doi.org/10.1002/ecs2.2140>;

Matt Provencher, "Wildfires in Western Washington: Less Frequent, but No Less Dangerous," *Forest Stewardship Notes* (Washington State University Extension; Washington State Department of Natural Resources, February 1, 2021), <https://foreststewardshipnotes.wordpress.com/2021/02/01/wildfires-in-western-washington-less-frequent-but-no-less-dangerous/>.

suppress fires that do occur, 3) maintain a healthy, biodiverse ecosystem that can be resilient in the face of disturbance, and 4) maintain defensible buffers around structures and buildings.<sup>2</sup> The goals of the Pioneer Park Forest Management Plan (PPFMP) are directed toward maintaining a healthy, biodiverse native forest with vegetated buffers and abundant downed wood for habitat and tree regeneration. The goals outline in the PPFMP are generally in line with expert recommendations. However, they also suggest that additional effort is needed to reduce ladder fuels and dense, dead vegetation where park boundaries overlap with a neighbor's defensible space.

Prescriptions for wildland fire response should include the early identification, as well as early request and allocation of resources. The size and location of the hydrant system surrounding Trust properties, as well as the immediate availability of a highly-trained, well-equipped firefighting staff, allow for rapid suppression of fires when they do arise, making these forests distinct from typical wildland fire situations.

The priorities for MIFD response in any situation are (in priority order) life, property, and incident stabilization. Protecting lives and adjacent homes would be the overriding concern of the Incident Commander in a forest fire situation. A large fire in the park could burn sizable portions of the park before it could be brought under control. There is also the risk of fire extending outside the park boundaries leading to a potential conflagration. Additional risk is assumed if a fire in the park reaches the crowns of a cluster of trees, particularly in warm, dry weather, in which case, providing a defensive line of fire crews to protect fire from reaching homes on the park perimeter would be a top priority. While uncommon in suburban/urban intermix areas, it should be a consideration of the fire response crews and pre-incident planning. Early identification and early resource allocation is imperative.

### **23.5 Evaluation**

Pioneer Park and Engstrom Open Space are susceptible to fire primarily from human behavior. Historical incidents of campfires and fireworks use in the park are concerns. The forest is particularly prone to drought during dry years because the soils are well drained. Woody debris and organic "duff" are abundant in the park, creating fuel in dry seasons. Houses back up to the park, with minimal distances between structures and stands of dense vegetation. The interior of the park is not accessible to fire vehicles because the trails are too narrow for large fire apparatus to traverse.

However, the size of the park and the cooler, moister climate of western Washington reduce risk in comparison to eastern Washington forest landscapes. The quadrants are surrounded by a network of fire hydrants that can supply water to the park perimeter and significant portions

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<sup>2</sup>Halofsky et al., "The Nature of the Beast".;

Brian Harvey, Daniel Donato, and Joshua Halofsky, "Fighting Wildfires in Western WA Requires Different Approaches | Crosscut," crosscut.com, July 14, 2021, [https://crosscut.com/opinion/2021/07/fighting-wildfires-western-wa-requires-different-approaches](https://crosscut.com/opinion/2021/07/fighting-wildfires-western-wa-requires-different-approaches;).;

Provencher, "Wildfires in Western Washington".

of the interior. Fire Station 92 is located across the street from the park. The staff of the MIFD is highly trained and experienced in incident response. Furthermore, mutual aid agreements with other cities and the availability of DNR crews would enable the City to respond and initiate mitigation and control measures, and provide specialized capabilities as conditions warrant.

Limitations in response include the difficulty of conveying water to the center portion of a quadrant, difficult terrain in certain areas of the park, and limited firefighting resources. For certain hydrants, vegetation poses a barrier to ready trail access, while other hydrants have no trails that lead into the park. City firefighters have not received training specific to the situation in Pioneer Park and Engstrom Open Space. These limitations are certainly addressable (See section 23.6 *Action Items*).

In most fire scenarios within the wooded areas, MIFD will likely lay hose lines into the interior of the park and wait for the fire to reach their location. One advantage here is that the park trail system provides reasonable access, except in the NE corner of the NE quadrant, where the terrain is untenable.

	Safety Factors	Risk Factors
Fire Occurrence	<ul style="list-style-type: none"> <li>Well-developed trail system</li> <li>Extensive fire hydrant network around park perimeter</li> <li>Nearby location of Fire Station 92</li> <li>Trained and coordinated firefighters</li> <li>Mutual aid agreements with other cities</li> <li>Availability of DNR resources</li> <li>Incident Management protocols for all possible fire scenarios (NIMS)</li> </ul>	<ul style="list-style-type: none"> <li>Narrow trail widths</li> <li>Some hydrant locations are not close to trail access points</li> <li>Lack of water conveyance to the interior of the park</li> <li>Lack of firefighter training specific to Trust properties</li> <li>Limited <i>initial</i> firefighting resources</li> <li>Hilly terrain and shrubby understory vegetation in certain quadrants reduces ability to lay hose lines close to the seat of a fire</li> </ul>
Fire Mitigation	<ul style="list-style-type: none"> <li>Street buffers</li> <li>Low summer temperatures</li> <li>Winter rainfall</li> <li>Low summer wind speeds</li> <li>Small land area</li> <li>Cooler, covered canopy</li> <li>Moisture of ground materials</li> </ul>	<ul style="list-style-type: none"> <li>Seasonal low rainfall</li> <li>Well-drained, drought-prone soils</li> <li>Woody debris and “duff” (ground fuel load)</li> <li>Campfire activity</li> <li>Fireworks use in the park</li> <li>Minimal backyard buffers</li> <li>Lack of supervision</li> </ul>

Figure 2: Case-specific factors in Fire Occurrence and Fire Mitigation at Pioneer Park and Engstrom Open Space

## **23.6 Vegetation Management Plan**

The Pioneer Park Forest Management Plan outlines the City's approach to maintaining a healthy, resilient forested ecosystem. Strategies described in the plan include preserving existing canopy, aiding natural regeneration by planting habitat- and climate- adapted species, and removing invasive plants to improve biodiversity and prevent overcrowding.

In addition to improving the health and resiliency of forests throughout the park, City staff will work with participating neighbors to cooperatively develop a plan for managing park boundaries that meets forest management and fire management goals. City staff will recommend ways the forest edge can be managed to establish a defensible space in areas where Trust property is within 30 feet of a home or structure<sup>3</sup>. Site-specific recommendations will be developed in accordance with resources and input from King Conservation District and King County Department of Natural Resources and Parks. Some examples of these recommendations are to 1) remove dense patches of dead vegetation, 2) ensure any dead trees that are leaning against structures or other trees are felled and in full contact with the ground, 3) prune overhanging branches to create a 6-10 foot buffer between any structures and the canopy.

## **23.7 Action Items**

### **Fire Occurrence**

1. MIFD will offer training for pertinent to the Pioneer Park and Engstrom Open Space situation. The DNR Western Washington Interagency Training Committee provides standard training on wildfire situations.
2. MIFD will familiarize staff with Pioneer Park and Engstrom Open Space and evaluate its existing equipment for anticipated incidents in the park.
3. MIFD will develop a list of desirable basic firefighting hand tools to be stored in fire caches at Stations 91 and 92.
4. Both departments will further research the availability of DNR for fire response and determine what conditions may warrant their involvement.
5. MIFD will work with other local jurisdictions to ensure the establishment and maintenance of Automatic Aid and Mutual Aid agreements.
6. MIFD will provide annual refresher training to fire crews on initial wildland fire response.

### **Forest Fire Mitigation**

1. Parks staff will conduct an educational campaign about fire-wise landscaping with adjacent property owners using existing educational materials.

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<sup>3</sup> King County Department of Natural Resources and Parks, "Be Firewise: Create the First Line of Defense," n.d., <https://your.kingcounty.gov/dnrp/library/water-and-land/forestry/forestfire/FirewiseBrochure-rev.pdf>.

2. Parks staff will work with interested park neighbors to establish a defensible space and improve habitat value along the residential perimeter of the park.
3. Parks staff will patrol remote locations of the park during summer months to identify and address potential human-cause ignition sources.
4. Parks staff and MIFD will develop a plan to improve trail access into the park for a narrow vehicle and create access points where the trail system does not connect well with existing hydrant locations.