Bull Run TREATMENT PROJECTS

Bull Run Filtration

The Bull Run Filtration Project will remove *Cryptosporidium* and other contaminants from the Bull Run water supply, producing cleaner, safer water for the nearly one million people who use our water today and for future generations. The project is required by the federal Safe Drinking Water Act and must be completed by September 30, 2027, per a bilateral compliance agreement with the Oregon Health Authority.

Learn More

Visit
portlandoregon.gov/bullrunprojects

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Potential for Wildfire in the Bull Run Watershed

Bull Run's old-growth forests are naturally fire resistant due to high amounts of precipitation, high humidity from moist westerly winds, deep organic layers that absorb and retain moisture, and moderate climatic conditions. However, wildfire is a known risk in all forests, as illustrated locally by the 2017 Eagle Creek Fire in the Columbia Gorge.

- Risk of fire ignition and spread is very low due to wet conditions, low frequency of lightning strikes during the fire season, low numbers of human-caused ignitions due to public access restrictions, and strong fire prevention and management policies and partnerships.
- Historical data suggests that when major fires do occur, they tend to be large (> 2,000 acres) high-severity crown fires. Such fires result in significant mortality of trees and loss of ground vegetation. A fire of this size and severity has not occurred during the existence of Portland's water system.
- Some historical fires in Bull Run likely started outside the watershed and burned into it. This continues to be a greater probability than a fire starting inside Bull Run.
- Based on a study of reconstructed Bull Run fire history, an area the size of the entire watershed is expected to burn approximately every 350 years, but not necessarily all during one fire event.
- Hotter, drier summers associated with climate change are expected to increase the risk of wildfire in the future.
- Fire ignition and spread in the Bull Run are more likely during prolonged periods of high temperatures, low humidity, and strong east winds. These conditions typically occur between mid-August and early October.

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- Risk of a major wildfire in the Bull Run is greatest when vegetation and fuels dry out, particularly when seasonally dry hot conditions combine with a period of prolonged drought (1-3 years) and below average snowpack.

- Fuel reduction tools (e.g., thinning and prescribed fire) commonly used in drier forests in eastern and southern Oregon are not appropriate or effective tools for the wet old-growth forests of the Bull Run.

- Reducing fuels enough to effectively reduce the fire risk would require drastic and extensive reductions in forest tree canopy and vegetation. Such treatments would significantly alter the long-term ecological processes and conditions that help maintain the high quality of Bull Run water.

- Fuel treatments in this forest type are also very short-lived because vegetation grows back very quickly. The resources and funding required to frequently maintain such treatments render them infeasible, especially over large areas.

- Hotter, drier summers associated with climate change are expected to increase the risk of wildfire in the future, but the overall risk of a large fire starting inside the Bull Run Watershed is expected to remain quite low, particularly when compared to many other forest types across the western US.

- The greatest ignition threat will continue to be a large crown fire burning into the watershed from outside, during extreme fire danger conditions.

- Management actions help reduce the potential for large fires, including effective partnerships with the US Forest Service and Oregon Department of Forestry, a strong fire prevention and detection program, an aggressive fire suppression policy, and availability of regional fire suppression resources.

- Prevention measures greatly reduce the risk of a human-caused ignition, including restricted public access, prohibition of commercial timber harvest and associated slash pile burning, and weather and fire risk related restrictions on maintenance and construction activities. Enhanced patrols throughout fire season monitor for evidence of fire in or near the watershed.

- PWB partners with the US Forest Service to staff the Hickman Butte fire lookout tower throughout the fire season, enabling rapid detection of fire starts in or near the watershed. Lightning data is evaluated after storm events and lightning strike locations are monitored for possible fire starts.

- Aerial surveillance is also often conducted by fire agencies following lightning events. If a fire is detected, aggressive suppression tactics are employed. The fire suppression policy is to extinguish any fire in the Bull Run as quickly as possible.

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- PWB and the US Forest Service would respond to a major fire event with aggressive erosion control measures.

- Erosion control could reduce, but not eliminate the turbidity and sediment effect on drinking water quality depending on location within the watershed.

- Since a large fire (>1,500 acres) has not occurred during the existence of the Bull Run water system, the effects of fire on Bull Run water quality are uncertain.

- Research in other forest systems indicates that the extent and duration of fire effects on water quality depend on the size, location, and severity of the fire, as well as numerous site-specific watershed characteristics (e.g., soils, topography and vegetation regrowth). If a large, severe fire occurs in the Bull Run, water temperature, nutrients, pH, organic carbon, and turbidity would all be affected, which in turn would affect the color, taste, and odor of the water.

- Filtration would help mitigate water quality effects anticipated after a large fire, particularly turbidity. Turbidity effects are expected to peak in the first 1-2 years following a major fire, slowly diminishing over time. Occasional turbidity spikes may persist for several years and possibly decades, mostly during the wet season.

- Wildfire is known to alter nutrient loading in burned watersheds, including both nitrogen and phosphorus.

- Biological activity in the Bull Run reservoirs tends to be phosphorus limited, so fire related increases in phosphorus, along with increased water temperatures, may increase the risk of harmful algal blooms (HABs).

- Harmful algal blooms, including toxic cyanobacteria blooms, would be more likely during the warm, dry season.

- Nutrient releases to the water supply are likely to be highest during wet season storm events when water temperatures are cooler and algal growth tends to be slower.

- Increased pathogens (e.g., E. coli, Giardia, and Cryptosporidium) are likely immediately following a fire due to increases in sediment loading and reduced filtration capacity of the organic layers on the forest floor.

- Longer-term changes to pathogen abundance and transport will be influenced by fire impacts on wildlife presence and behavior. Wildlife are the primary sources of pathogens in the Bull Run.

- Dissolved organic carbon is also likely to increase following wildfire. Elevated dissolved carbon concentrations tend to be associated with high flow events within the first 1-2 years following a wildfire. Dissolved organic carbon is of concern due to the potential for disinfection byproducts to form when the dissolved carbon reacts with chlorine.

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- Wildfire impacts to water quality will occur primarily following heavy rainfall events during the wettest periods of the year.

- For the Bull Run, the wet season is typically from late October to April, a time period that coincides with lower customer demand. Groundwater and reservoir management also provide tools to manage water quality effects after a fire.

- Groundwater can be used during periods when filtration plant operations need to be adjusted to post-fire raw water quality changes. The Bull Run reservoirs can be used to help settle out wildfire-generated sediment, and storm events will gradually flush sediment downriver.

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