Land Use Application Appendix H

Tree Mortality Data and Trends in the Portland General Electric (PGE) Service Territory
Prepared by the PGE Wildfire Planning & Analytics Team
October 14, 2024

A major concern for the future condition of Forest Park (and environmental resources broadly) is climate change-related drought and peak summer temperatures that are higher than historical average temperatures[1]. Drought conditions in the Pacific Northwest have become much more prevalent over the past decade, a clear signal of climate change. One method for assessing drought trends and severity is the Evaporative Drought Demand Index (EDDI). This online tool measures the evaporative demand on vegetation and the environment due to extended periods of anomalously hot and dry weather. EDDI is an indicator of both short- and long-term drought. Figure 1 below presents an EDDI time series for conditions in the PGE service territory from 1979 through 2024. The plot shows a clear signal of increased drought in the Pacific Northwest in the recent decade Drought exacerbates large scale tree mortality and decreases overall forest health and wildfire safety.

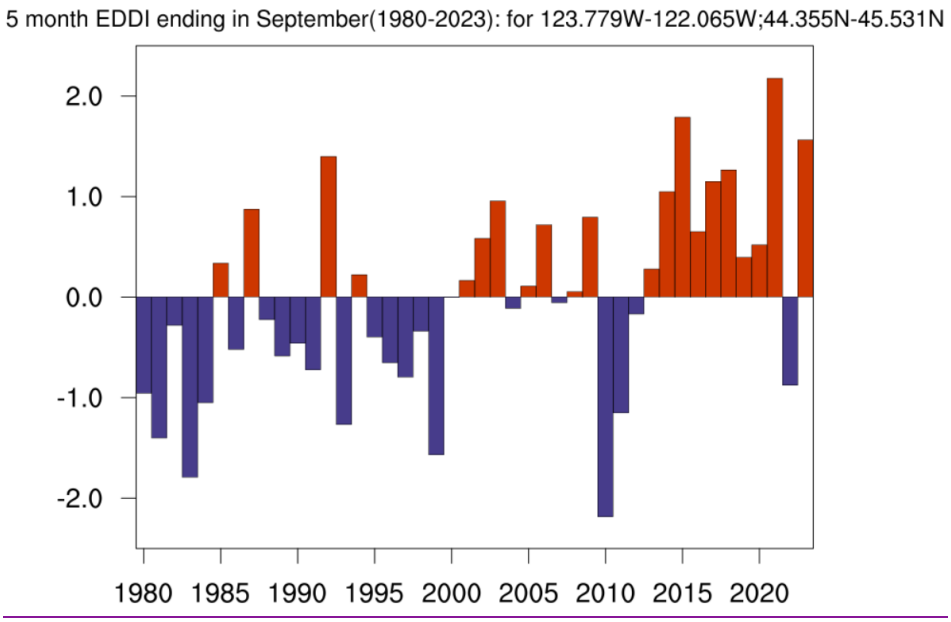

Figure 1: A time series plot of Evaporative Drought Demand Index (EDDI) for dry season months (May through September) from 1979 through 2024.

This EDDI time series plot shows standardized anomalies in evapotranspiration indicating the spatial extent and severity of drought. Positive EDDI values indicate anomalously high evaporative demand and therefore increased drought stress. The EDDI plot was obtained from the NOAA Physical Sciences Laboratory[2]. The effects of drought are causing significant conifer forest mortality within forests throughout PGE's service territory, which includes all of Forest Park. An annual status report on forest

[1] ODF Climate Change and Carbon Policy, 2024. Available online at: https://www.oregon.gov/odf/forestbenefits/Documents/odf-climate-change-and-carbon-plan-draft.pdf
[2] NOAA Physical Sciences Laboratory, Evaporative Drought Demand Index tool available online at: https://psl.noaa.gov/eddi/#results

health jointly published by the U.S. Forest Service and the Oregon Department of Forestry (ODF)[3] noted the connection between tree mortality and drought saying "In 2022, we continued to see the negative direct and indirect impacts of persistent droughts. Historic levels of tree mortality … were observed across the state." The report also notes that "in recent years climate change impacts such as ongoing hot droughts have increased susceptibility to opportunistic insect and disease agents."

PGE's Wildfire & Planning Analytics Team routinely monitors climate and forest health trends to plan for wildfire hazard reduction, resilience, and abatement. To assess the severity of current forest health threats due to climate change, the team reviewed data used by ODF in 2019 to estimate projected tree mortality rates. PGE acquired the 2019 LiDAR data that was used to model future tree mortality rates in Forest Park and compared it with new LIDAR data acquired this year (2024). The comparison revealed that observed mortality rates exceeded the 2019 mortality projections by 1,310%. This suggests a an acceleration in tree mortality trends over the last five years.

In 2022, the most recently-published U.S. Forest Service and ODF *Forest Health Highlights in Oregon* observed 2.7 million acres of tree damage and mortality in Oregon from insects, diseases, and non-wildfire, abiotic stressors associated with drought. This represents a 70% increase above the 10-year average. Large numbers of dead trees increase the risk of catastrophic wildfire, which would further damage environmental resources in Forest Park and create serious public safety impacts from falling trees. Per the ODF's 2024 *Climate Change and Carbon Policy*, the ongoing damage and potential for serious future loss of resources cannot be addressed without addressing atmospheric carbon concentrations. A key strategy to reverse climate change is electrification of energy uses and decarbonization of power generation. These efforts depend fundamentally upon the reliability of the transmission grid.

[3] U.S. Forest Service and ODF's 2022 *Forest Health Highlights in Oregon* is available online at: https://www.oregon.gov/odf/forestbenefits/Documents/odf-usfs--2022-forest-health-highlights.pdf