NC STATE UNIVERSITY

North Carolina
Institute for Climate Studies

Wildfire Risk in Western North Carolina: Urgent Priorities in the Post-Helene Landscape

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Overview

Western North Carolina (WNC) faces a sustained and evolving wildfire threat stemming from the historic impacts of Hurricane Helene. On September 27, 2024, the storm delivered unprecedented rainfall (30+ inches in some areas) followed by extreme wind gusts (up to 106 mph), causing widespread blowdown and timber damage across an estimated 822,000 acres in 17 counties. The resulting increased fuel load, compromised access routes, and destabilized terrain have created a multi-year to multi-decade hazard that requires sustained resources and coordinated, proactive planning.

Key Risks and Impacts

- **Extraordinary Fuel Loads**: Downed timber, broken canopy cover, and debris across steep terrain now represent a volatile fuel source. In the short term, smaller-scale storm debris contributes to ignition and fast-spreading fires. In the medium to long term, downed and drying hardwoods (including oaks and hickories) will lead to heavier fuel loads, prolonged smoldering fires, and significant smoke production.
- **Blocked Access and Containment Challenges**: Many roads are washed out, while other routes and fire breaks are heavily obstructed by downed trees. Many natural fire barriers (streams, gaps in forest cover) are now choked with woody debris or were altered entirely by flooding and landslides, reducing their effectiveness in slowing fire spread. Fire crews may have limited access for suppression work, resulting in larger, harder-to-control wildfires.
- **Threats to the Wildland-Urban Interface (WUI)**: North Carolina has more WUI acreage than any other state, heavily concentrated in the western region. More than 90% of properties in multiple WNC counties are categorized as WUI. Widespread storm damage near and within communities increases ignition potential and heightens structural, infrastructure, and population vulnerability.
- **Forest Health**: Damaged trees are highly susceptible to insect infestations (pine beetle, emerald ash borer, spongy moth) and disease. Non-native and invasive plants are expanding rapidly in disturbed areas, exacerbating long-term ecological degradation. This evolving challenge will require sustained manpower and expertise to monitor and manage.

- **Economic Loss and Landowner Impact**: Timber damage in the state exceeds an estimated $214 million in value. In counties like Avery, Mitchell, and Watauga, over 30% of forestland has been affected. The North Carolina Forest Service (NCFS) faces staffing shortages in many impacted counties, limiting its capacity to assist landowners with recovery, planning, and mitigation.

Timeframe and Urgency

These wildfire risks will play out over multiple timelines:

- **Immediate (2025)**: High ignition risk from fine fuels and debris; critical gaps in access and readiness.
- **Short-Term (2–5 years)**: Increased insect and disease outbreaks; heightened WUI danger from drying of larger fuels.
- **Long-Term (5–15+ years)**: Large fuels will persist on the forest floor, increasing the risk of long-burning, smoky wildfires and hampering suppression access unless mitigated.

Coordination and Communication Needs

This is not a one-agency challenge. Effective wildfire preparedness and response in WNC will require:

- **Cross-agency and cross-jurisdictional coordination** – among local, state, and federal wildfire response agencies, emergency managers, planners, and scientific partners.
- **Public and stakeholder communication** – ensuring residents understand evolving risks and how to prepare.
- **Legislative engagement and resource allocation** – securing support for suppression entities, equipment, staffing, landowner assistance, data and mapping tools, and long-term forest recovery programs.

For More Information
For questions about wildfire risk assessments, data, or coordination support, please contact:

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