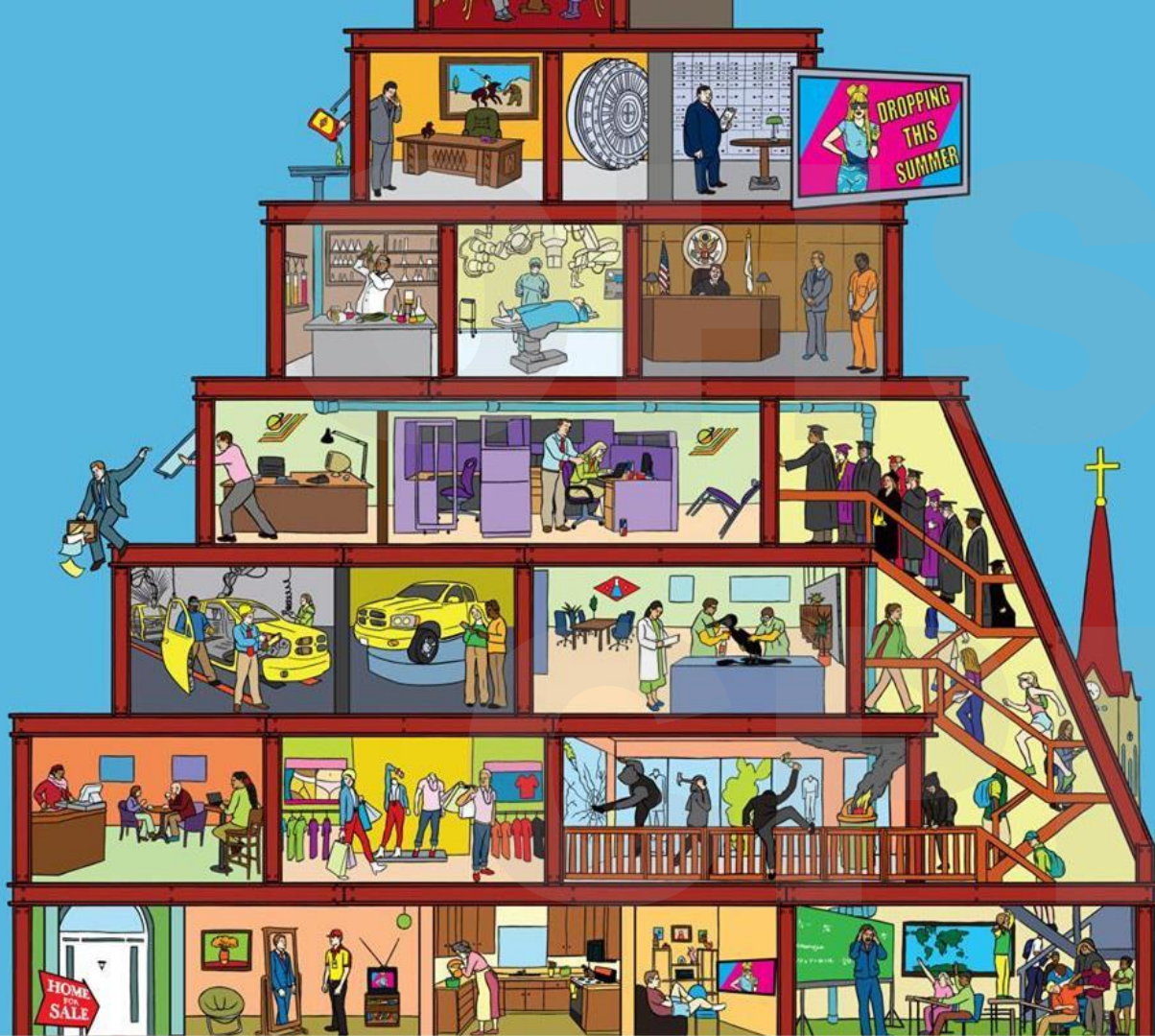




Wildland Fire & Public Health: A Wilderness Medicine Perspective

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**No Financial
Disclosures**

Biography

- **Wildland Firefighter**
- Experience with both private and government agencies in fire suppression, fuel mitigation, and forest restoration
- Served as the sole medical provider on a wildland fire crew
- Currently EMS Fellow at OHSU



Learning Objectives

- Understand the scope and drivers of the wildfire crisis
- Recognize clinical and operational impacts on wilderness medicine
- Identify strategies for mitigation, preparedness, and advocacy
- Highlight the role of wilderness providers in response and policy



A photograph of a forest fire. Bright orange and yellow flames are visible, rising around the trunks of several trees. The ground is covered in dry grass and brush, which is also on fire. The background shows more trees and a hazy sky. A semi-transparent white box is overlaid on the left side of the image, containing the title text.

Historical Role of Fire

A wide-angle photograph of a high-altitude mountain landscape. In the background, a large, jagged mountain peak is covered in snow and partially shrouded in mist. The middle ground shows a rocky, barren valley floor. In the distance, a small cluster of buildings, likely a village or camp, is visible. The foreground is a rocky, uneven terrain. The sky is overcast with soft, diffused light. The text is overlaid in the upper center of the image.

“Speech, tools, and fire are the tripod of culture and have been so, we think, from the beginning”, Sauer

Epidemiology



Expanding Fire Geography

- Fires now in chaparral, boreal forest, tropical grasslands
- Lahaina 2023: >100 deaths, catastrophic infrastructure loss (USFA 2023)
- “No biome is immune”



The Modern Day Crisis In Context

- Wildland fire now a **public health emergency** (WFM&MC 2023)
- Drivers: climate instability, land-use change, loss of Indigenous fire stewardship
- Fire seasons → fire years





CPD

Climate As the Central Accelerant

- Hotter temps, drier soils, altered precipitation → more flammable landscapes (Westerling 2016)
- Large wildfires ↑ 700% in frequency, 1200% in area since 1980s
- Fire in “low-risk” zones: Hawai‘i, Northeast forests



Historical Policy: Suppress at All Costs

- 1910 Big Blowup → “10 a.m. policy” (Pyne 1982)
- Decades of suppression = unnatural fuel buildup
- Altered fire-adapted ecosystems → more severe burns



Policy Shift: From Suppression to Stewardship

- “On Fire” report: proactive fire management (WFM&MC 2023)
- Indigenous burning, prescribed fire, managed wildfire
- Requires broad, cross-sector collaboration



A photograph showing the aftermath of a wildfire. In the center, a brick chimney stands tall amidst the ruins of a building. The ground is covered in ash and charred debris. Trees with brown, dead leaves are scattered around the site. A semi-transparent white box is overlaid on the left side of the image, containing the text 'Wildland Urban Interface'.

Wildland Urban Interface

An aerial photograph of a town nestled in a valley. The town features various buildings, including houses and commercial structures, interspersed with trees showing autumn foliage. In the background, a range of mountains is visible under a clear blue sky. A semi-transparent dark blue box is overlaid on the left side of the image, containing text.

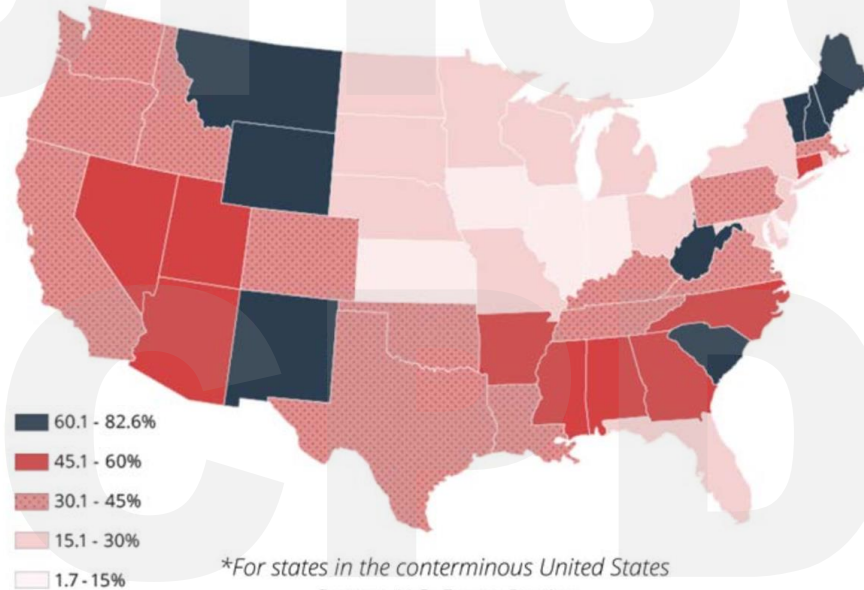
WUI:

Areas where human development meets or intermingles with undeveloped wildland and vegetative fuels that are both fire dependent and fire prone. It is the line, area or zone where structures and other human development transition or intermingle with undeveloped wildlands or vegetative fuels.

States with the greatest number of houses in the WUI:

1. California 2. Texas 3. Florida 4. North Carolina 5. Pennsylvania

Number of houses in the WUI relative to the total houses in the state*



Source: U.S. Forest Service

Post-Fire Hazards

- Flooding, landslides, water contamination (Sankey 2017)
- Ash toxins
- Years-long watershed impact



Case: Lahaina

- Rapid spread from hurricane winds, invasive grass
- 100 deaths, infrastructure collapse



Case: Camp Fire

- 85 deaths, 50k displaced
- EMS overwhelmed



Public Health Impacts



Smoke Hazard

- PM2.5, VOCs → asthma, MI, stroke (Reid 2016)
- Chronic exposure = long-term risk
- Often more dangerous than flames
- 2023 Canadian fires → hazardous AQI in NYC, Philly
- 25% of annual PM2.5 in US from wildfire smoke (O'Dell 2020)





Long-term health effects of wildfire exposure: A scoping review

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Mental Health & Ethics



Occupational Health

- High cardiac risk, smoke exposure (Navarro 2019)
- Mental health needs (Thompson 2022)
- Lung injuries and Cancer Risks



An aerial photograph of a dense urban landscape, likely New York City, showing a variety of skyscrapers and mid-rise buildings. The image has a warm, orange-tinted overlay. A semi-transparent white rectangular box is positioned on the left side, containing the title text. Faint, large, light-blue letters 'S' and 'D' are visible in the background, possibly part of a larger graphic or watermark.

Health Care Disruptions

Impacts On Wilderness Medicine



A large, intense wildfire is burning in a forest. Thick, bright orange and yellow flames are visible, rising high into the air. Dark, billowing smoke is seen against a clear blue sky. In the foreground, there is a field of low-lying, greyish-green vegetation. Several tall, thin evergreen trees are scattered throughout the scene, some of which are partially obscured by the fire. The overall atmosphere is one of a major natural disaster.

Field Closure

SAR & Fireline Overlap

- Prolonged field care
- Delayed evac common (Hawkins 2025)
- Telemedical support growing
- Role for direct physician supervision



PPE in Wilderness

- N95/P100 for smoke (IAFC 2021)
- Fit-testing challenges in austere environments



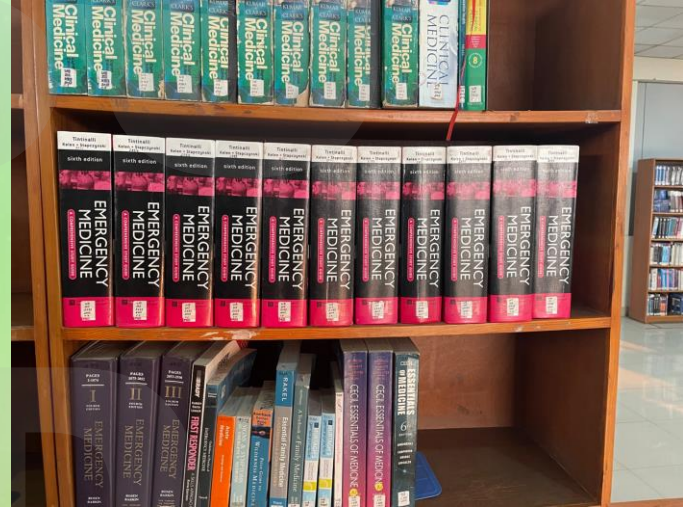
Fire Literacy

- Haines Index, Red Flag Warnings, AQI
- Integrate into expedition planning



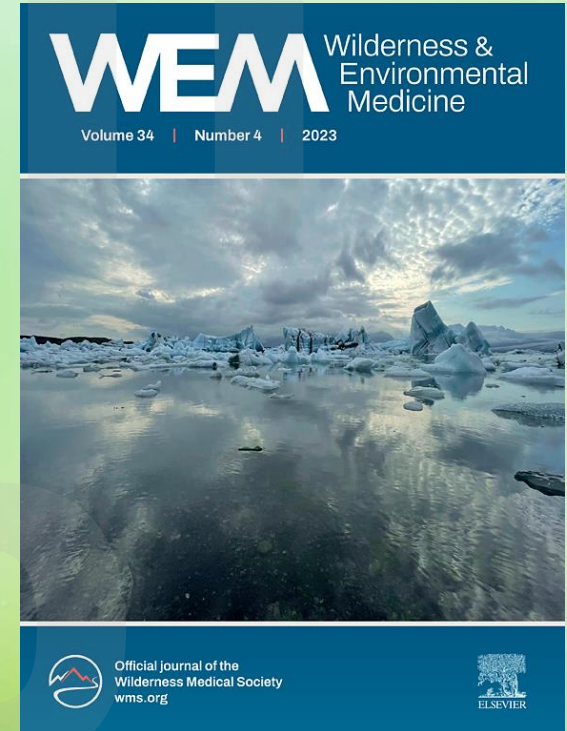
Curriculum Gaps

- Entrapment physiology
- Smoke illness care
- Remote burn stabilization
- Expedition planning



Research Gaps

- Austere smoke care
- Physician oversight outcomes
- Responder health data



Wilderness EMS



EMS & Prolonged Field Care

- Evacuation support, triage, shelter med
- Need for wildfire-specific protocols
- Stabilization in austere settings
- Coordinate with burn centers, fire med units



Wilderness Skills in

- **Improvisation,**
austere care,
ecological literacy
- Bridge between
EMS & public
health



Telemedicine & Direct Physician Supervision

- Remote consults for crews, SAR
- Needs comms infrastructure
- Physicians imbedded in SARs specific teams



EMS in Planning

- Evac maps, shelter med, comms backup
- Mutual aid agreements
- Smoke PPE stockpiles
- HEPA filtration in shelters



A photograph of a yellow tent pitched on a snowy, rocky mountain slope. In the background, a large, snow-covered mountain peak rises against a dark, overcast sky. The tent has the 'THE NORTH FACE' logo on its side. The scene is dimly lit, suggesting dusk or dawn.

Next Steps?

Clinical Readiness

- Kits: PPE, eye protection, asthma/COPD meds
- Evac maps, hazard awareness
- Solid foundation knowledge in both potential treats and injuries caused by wildland fire



Leadership

- Public Education: Trusted messengers for safe wilderness use during fire season
- Educators, advocates, innovators
- Embed wildfire readiness in austere care



Advocacy

- Indigenous Stewardship:
Cultural burns maintain ecosystem health (Kimmerer 2001)
- Community Paramedicine:
Wellness checks, mask distribution, chronic care during evac



Advocacy

- Operational Readiness: Comms redundancy, SAR–EMS–fire integration
- Policy Role: Zoning limits, mobile care funding, EMS in wildfire task forces
- Funding Opportunities: IIJA & IRA resilience funds, Build telehealth, PPE capacity



Advocacy

- Public Health Engagement:
Air quality alerts + targeted outreach
- Responder Health Advocacy:
Monitor exposures, Support housing & mental health funding



An aerial photograph of a dense urban landscape, likely New York City, featuring numerous high-rise buildings and a mix of architectural styles. The image is overlaid with a semi-transparent white rectangular box on the left side, which contains the word "Conclusion" in a bold, black, sans-serif font. The background has a warm, orange-tinted hue, suggesting a sunset or sunrise atmosphere. There are also faint, large, semi-transparent letters "S" and "E" visible in the background, possibly part of a larger graphic or watermark.

Conclusion

Questions



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