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Wildfire recovery in Pacific Northwest Latine communities: how community capitals shape disaster resilience

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Wildfires are increasingly affecting people's lives in the Pacific Northwest. Latine populations, in particular, often face unique challenges in their recovery process. This study examines individual Latine wildfire recovery experiences to understand the strengths and barriers in the community's post-fire recovery process in two wildfire-affected areas in Oregon and Washington. Perceptions of recovery of Latine community members and community-based organizations that serve these populations were collected through focus groups, semi-structured interviews, and participant observation at community events. Results were analyzed using the Community Capitals Framework. Findings reveal that organizational, human, cultural, and social capitals played central roles in shaping recovery. While strong community networks and cultural cohesion facilitated mutual aid, systemic inequities, such as language barriers, exclusion from decision-making, and limited access to formal assistance, hindered recovery. Our findings offer insights into the evolving nature of community disaster recovery and suggest that inclusive disaster response strategies must account for the strengths and structural barriers experienced by vulnerable communities. By centering Latine voices and examining recovery through a community capitals lens, this study contributes a nuanced understanding of how intersecting forms of capital influence recovery. The outcomes provide practical guidance for policymakers, emergency managers, and community organizations seeking to develop more equitable, culturally grounded disaster recovery strategies. This research expands the field's understanding of community-based recovery by highlighting the importance of relational and cultural strengths, while also identifying points of intervention to reduce vulnerability and promote long-term recovery in underserved populations.

KEYWORDS

fire, WUI, marginalized, Latinx, Latino, qualitative

1 Introduction

Wildfires in the Pacific Northwest are becoming more frequent and severe (Iglesias et al., 2022) due to climate change (Wasserman and Mueller, 2023), land management practices (Downing et al., 2022; Hessburg et al., 2021), a legacy of fire suppression (Kreider et al., 2024), increasing development (Chen et al., 2021), and anthropogenic ignitions (Hantson et al., 2022). Rising temperatures, prolonged drought conditions, and increased fuel loads contribute to longer fire seasons (Diffenbaugh et al., 2021; Richardson et al., 2022; Varga et al., 2022),

placing communities in the wildland-urban interface (WUI) at heightened risk of wildfire exposure (Chen et al., 2021; Peterson et al., 2021; Swain, 2021).

National datasets corroborate these regional patterns. For example, Weber and Yadav (2020) show that wildfire frequency and burned area have increased across the Western United States since the 1950s, with notable acceleration after 2000. Similarly, Pausas and Keeley (2021) emphasize that U. S. wildfire trends reflect broader global changes, linking climate pressures and land use to escalating fire regimes. Together, these studies demonstrate that the Pacific Northwest cases examined here are part of a wider national and global shift toward more frequent and severe wildfires.

The impacts of wildfires extend beyond the immediate destruction of homes and infrastructure (Schmidt et al., 2025); they also include long-term disruptions to livelihoods, access to essential services, and overall community stability (Moloney et al., 2023). While wildfires are a growing threat, recovery—the process of restoring physical, economic, and social systems to pre-disaster conditions (Smith and Wenger, 2007)—from these disasters is not experienced equally by all populations (Davies et al., 2018). Spatial vulnerability is shaped by long-standing social and economic inequalities that influence who lives in the most fire-prone areas (Davies et al., 2018; Schumann et al., 2024). Populations with fewer resources often reside in high-risk zones due to unaffordable housing markets, exclusionary zoning, or historical patterns, making their exposure to wildfire hazards a direct reflection of structural inequity (Méndez et al., 2020; Davies et al., 2018; Chakraborty and Collins, 2021).

Disaster preparedness and risk mitigation efforts are likewise unequally distributed. Social diversity significantly influences preparedness for and recovery from wildfires (Paveglio and Edgeley, 2017; Paveglio et al., 2018). For example, poorer individuals often have difficulty accessing emergency resources, rebuilding their homes, and having a voice in recovery-related decision-making (Arcaya et al., 2020). Cultural and linguistic differences can also influence disaster preparedness, with some populations less likely to receive or trust official communications or to understand local risks (Baker et al., 2024; Muruthi et al., 2025; Trujillo-Pagán, 2007). Differing orientations toward land use and community relationships also influence disaster experiences (Paveglio et al., 2015, 2018). For example, in the wake of a catastrophic wildfire in Washington in 2014, three socially diverse groups approached recovery through distinct lenses: one emphasized the need to stay and better defend their property, a second emphasized the importance of mitigation and planning, and the third emphasized improving city autonomy and infrastructure (Edgeley and Paveglio, 2017). Context-specific disaster preparation and recovery strategies may help address different social needs and vulnerabilities.

Disparities in exposure and preparedness are rooted in broader patterns of social vulnerability. Social vulnerability to disasters refers to how social and economic inequalities—such as poverty, discrimination, and limited access to resources—increase risk of harm and reduce capacity to respond and recover (Thomas et al., 2013). Researchers have consistently found that certain populations—such as women, children, the elderly, low-income individuals, people with disabilities, and racial and ethnic minorities—tend to experience the most severe impacts of disasters (Bolin and Stanford, 1998; Thomas et al., 2013). Socially vulnerable populations in the US West often live in areas with heightened wildfire risk, including agricultural and rural

communities where fire prevention resources may be scarce (Davies et al., 2018; Palaologou et al., 2019; Schumann et al., 2024). One such vulnerable group, Latines—which we define herein as individuals of Latin American descent living within the US, often united by a shared linguistic and cultural heritage—face increased challenges due to structural barriers, economic limitations, and gaps in emergency management policies (Baker et al., 2024; Villarreal, 2023). These inequities increase vulnerability during disasters and complicate recovery.

The disproportionate effects of wildfire on Latine communities are rooted in broader socio-economic vulnerabilities, such as language barriers, precarious housing conditions, limited financial resources, and racial discrimination (Baker et al., 2024; Méndez et al., 2020). Studies also show that undocumented Latines may avoid heeding official sources of emergency information or seeking aid due to fears related to immigration enforcement, compounding their vulnerability (Baker et al., 2024; Méndez et al., 2020; Trujillo-Pagán, 2007; Villarreal, 2023). Recovery resources are often structured around standardized approaches—such as financial assistance applications requiring English fluency, computer skills, or internet access—that fail to account for the cultural and linguistic needs of diverse populations, leading to further exclusion from critical assistance programs (Baker et al., 2024; Bolin and Stanford, 1998; Woolf, 2019). Given these disparities, a more nuanced and equity-focused approach is necessary.

Equity refers to fair and just access to resources, decision-making power, and opportunities, ensuring that all individuals and communities—particularly those that are disproportionately vulnerable—have what they need (Wiles and Kobayashi, 2020). Equity in disaster preparedness and recovery requires attention to three interrelated dimensions: recognitional, procedural and distributive equity (Auer, 2021; Sloan et al., 2025). Recognitional equity acknowledges different identities, values, and knowledge to ensure all perspectives are seen and incorporated (Leach et al., 2018; Meerow et al., 2019). Procedural equity focuses on fair and inclusive decision-making processes, emphasizing the need for meaningful participation from vulnerable populations in recovery planning and governance (McDermott et al., 2013; Leach et al., 2018). Distributive equity concerns the allocation of costs—such as wildfire risk—and benefits—including resources like financial aid, housing assistance, and emergency services—ensuring that aid reaches those most in need rather than reinforcing pre-existing inequalities (Leach et al., 2018; Sloan et al., 2025; Wiles and Kobayashi, 2020).

Integrating recognitional, procedural, and distributive equity dimensions to dismantle systemic barriers and ensure that everyone has resources and agency is the aim of disaster justice (Lukasiewicz, 2020; Verchick, 2012). Just disaster recovery processes require vulnerable communities to play a central role in the co-creation of systems designed to support them (Tran and Kim, 2024). However, it is crucial to ethically engage individuals and communities by respecting their potentially limited time and energy, avoiding compounding any vulnerabilities, maintaining clear expectations and trust (Browne and Peek, 2014; Cuervo et al., 2017; Hakkim, 2022), and heeding potential power imbalances (Tuhkanen, 2023). Using an equity framework to understand how individuals assess how their community's unique assets and challenges unfold in wildfire recovery may serve as a valuable first step for creating effective recovery strategies and disaster justice more broadly.

This study applies the Community Capitals Framework (CCF) (Flora et al., 2005; Emery and Flora, 2006) to examine the wildfire recovery experiences of two Latine communities in Oregon and Washington. Previous CCF literature lacks a definition of ‘community,’ but here it refers to a group of individuals with a shared cultural or linguistic heritage who are currently residing in a similar geographic area. Furthermore, we directly probe participants for their definitions of ‘community.’ ‘Capital’ refers to elements, assets, strengths, resources, and relationships within a community that contribute to the community’s overall health and functioning (Mattos, 2015). The CCF identifies seven interdependent forms of capital—natural, cultural, human, social, political/organizational, built, and financial—that shape community. Each capital represents a fundamental asset or resource that can generate other resources that communities rely on for stability and growth (Flora et al., 2005; Emery and Flora, 2006). We describe them here with examples of how they relate to wildfire response or recovery (see Table 1).

The CCF provides a holistic way to assess how communities use different capitals to strengthen their well-being (Emery and Flora, 2006) or respond to disasters (Koch et al., 2017; Quinn et al., 2022). Previous research has demonstrated that communities with stronger and more interconnected capitals tend to be more resilient and capable of long-term recovery after disaster, whereas communities with deficits in critical areas—such as financial or political capital—face prolonged hardship and inequitable rebuilding processes (Aldrich and Meyer, 2015; Koch et al., 2017). For example, strong social capital—such as tight-knit families, neighbor-to-neighbor assistance, and community-based organizations—can significantly improve disaster response and recovery outcomes (Aldrich and Meyer, 2015; Nakagawa and Shaw, 2004). In line with this approach, Blockstein et al. (2024) found that community-based organizations, churches, and schools are assets that enable strong social capital among Latine populations in high-hazard-risk coastal areas.

However, social capital can also limit disaster recovery in critical ways, such as through reinforcing exclusion, amplifying vulnerability, resisting change, and obstructing equitable access to resources (Aldrich and Meyer, 2015). Other key limitations of social capital after disasters are that networks composed of similarly vulnerable individuals may amplify collective trauma, and displacement and relocation of vulnerable people after fire (Litt, 2012) may decrease critical resources for recovery (Fussell, 2012). Recognizing these limitations underscores the importance of clearly defining recovery and resilience to better evaluate how social dynamics shape post-disaster outcomes.

To assess community recovery with the aim of creating disaster resilience requires conceptual clarity regarding the terms *recovery* and *resilience*. These terms are frequently used in disaster literature but are often under-defined or interpreted in ways that obscure important social and political dimensions (Fox et al., 2023; Cretney, 2016; McWethy et al., 2019). Recovery is commonly defined as the process of restoring physical, economic, and social systems to pre-disaster conditions (Smith and Wenger, 2007). However, this definition implies a return to a prior state that may have been inequitable, precarious, or maladaptive—particularly for vulnerable communities (Levine et al., 2007; Cretney, 2016). For example, rebuilding a fire-destroyed home is a common symbol of wildfire recovery, yet questions about whether that home is rebuilt with fire-resistant materials, or those living there

feel at home, are not addressed. In such cases, “returning to normal” risks reinstating the very vulnerabilities that exacerbated disaster impacts. Critics argue that recovery should not only be about rebuilding infrastructure but also about addressing pre-existing structural inequities and fostering systemic change (Brady et al., 2023; Cuervo et al., 2017; Lukasiewicz, 2020). Research further underscores that effective and adaptable recovery must be localized, culturally relevant, and community-led to address the diverse needs of affected populations (Brady et al., 2023; Paveglio and Edgeley, 2017; Quinn et al., 2022). These insights are particularly critical in Latine communities, where systemic barriers—such as exclusion from aid programs, lack of bilingual resources, and economic precarity—as well as intersections of community assets with environmental hazards, ultimately shape differential recovery (Baker et al., 2024; Blockstein et al., 2024; Villarreal, 2023).

In early environmental and engineering contexts, resilience was framed as the ability of a system to “bounce back” after a disturbance (Holling, 1973). In disaster studies, this definition has evolved to include the capacity of individuals and communities to absorb, adapt, and transform in response to hazards (Cutter et al., 2014; Norris et al., 2008). However, critiques have emerged about how resilience is measured and applied, especially when it becomes a tool to shift responsibility for adaptation onto vulnerable populations without addressing the structural causes of vulnerability (Cretney, 2016; Côté and Nightingale, 2012; Tierney, 2015). Traditional resilience frameworks often overemphasize environmental and infrastructural disturbances, while under-theorizing the political, economic, and cultural dimensions of vulnerability—even though power, inequity, symbolism, and competing values shape socio-environmental relationships in and out of disasters (Côté and Nightingale, 2012; McWethy et al., 2019; Paveglio et al., 2015, 2018; Tuhkanen, 2023). In response, scholars have called for equity-centered resilience, which emphasizes the importance of social justice, participatory governance, and culturally grounded indicators in defining and building resilience (Lukasiewicz, 2020; Auer, 2021; McWethy et al., 2019). This approach aligns with the Community Capitals Framework, which underscores the interdependencies between community assets (e.g., cultural, organizational) in shaping a community’s ability to navigate and grow through disruption (Emery and Flora, 2006; Koch et al., 2017). Particularly in the context of Latine communities, resilience must include recognition of context-specific challenges such as language exclusion, immigration status, and housing precarity, alongside community strengths such as kinship networks, cultural cohesion, and mutual aid systems (Baker et al., 2024; Blockstein et al., 2024). This study centers community-driven understandings of post-disaster recovery, including emotional, cultural, and relational dimensions. It draws on power-aware, justice-oriented frameworks to recognize the systemic barriers that shape uneven vulnerability and recovery. By integrating community-member perspectives through qualitative research and an assessment of various aspects of community, this research contributes rich data about community strengths and challenges to broader discussions on wildfire recovery, disaster justice, and equitable resilience.

This research examines the wildfire recovery experiences of Latine residents in two communities in Oregon and Washington using the

dual lenses of (1) community capitals and (2) equity to assess resident access to and use of resources. The objectives of this study are:

1. Identify strengths and barriers within natural, cultural, human, social, organizational, built, and financial capitals in each community's recovery.
2. Analyze the recovery experiences of Latine wildfire survivors and their communities, paying particular attention to how access to different forms of capital influences long-term recovery outcomes.
3. Provide insights to improve equity in post-wildfire access to recovery resources, emphasizing policy recommendations and community-driven solutions to improve preparedness and resilience for vulnerable populations.

By centering Latine voices and experiences, this study contributes to ongoing discussions about how disaster recovery can be more inclusive and responsive to the needs of vulnerable communities. Recognizing the role of systemic inequities and community assets in shaping long-term recovery is essential for fostering more just and effective disaster recovery efforts.

2 Materials and methods

2.1 Study area

We conducted research in two wildfire-affected communities (see [Figure 1](#)): Pateros, in Okanogan County, Washington, and Otis, located in Lincoln County, Oregon. National analyses highlight why these communities are especially at risk. [Iglesias et al. \(2022\)](#) document that U. S. fires became larger, more frequent, and more widespread in the 2000s, trends that intersect with the expansion of the wildland–urban interface ([Kramer et al., 2019](#); [Caggiano et al., 2020](#)). As a result, interface towns like Pateros and rural residential areas like Otis reflect the frontlines of broader national wildfire dynamics.

Pateros, Washington, an incorporated area, is located at the confluence of the Methow and Okanogan Valleys along the Columbia River and Highway 97. It has small but active businesses and community organizations. Most homes, older single-family structures, stretch up the hillside away from the river. Pateros has a population of 668; 46.85% are Hispanic, 42.1% White, and 4.94% Asian. The town's economy is largely based on manufacturing and construction (27%) and agriculture (22%) ([Data USA, 2025](#)). The town and surrounding area rely heavily on seasonal agricultural labor, with many Latine residents working in orchards and farms, which are visible from the highway. In the high school and other community organizations, Spanish language signs and fliers in English and Spanish are common.

Pateros is situated at 241 m.a.s.l. and surrounded by sagebrush steppe and mixed dry conifer forest ecosystems. It has an arid climate, with annual precipitation falling as a mixture of snow and rain and averaging 406 mm, with hot summers and cold winters. The residents of Pateros reported little familiarity with wildfire and smoke prior to the Carlton Complex (2014), despite being surrounded by dry ecosystem types that evolved with fire. Sagebrush-dominated ecosystems, which typify lowland areas in Okanogan County, have fire

return intervals ranging from 50 to 200 years, but upland forests burn much more frequently, often on decadal time scales, though fire suppression practices in the past century kept most fires small. The Carlton Complex was a series of four lightning strikes that ignited near Pateros in July 2014 and converged, burning 103,643 ha and 357 homes in Okanogan County. This fire remains Washington's largest wildfire on record.

Otis (population 1,389) is an unincorporated, forested rural area that is predominantly residential, consisting mainly of manufactured homes scattered across the hillside or lining the Salmon River and Highway 18. There are two community centers, one café, a gas station, a convenience store, and a post office. Schools, social services, stores, restaurants, and most employment opportunities are in larger nearby coastal towns. Because of its rural nature, specific demographic data for Otis are lacking, but Lincoln County's population is 10.4% Hispanic or Latino (Latine) ([U.S. Census Bureau, 2024a, 2024b](#)) and 8.8% (of the total population) are of Mexican origin ([U.S. Census Bureau, 2022](#)). According to research participants, Latines resided in 10 of Otis' 300 homes affected by the fire. According to research participants and personal observation, the town also has a large number of retirees. With few businesses or public spaces, residents and outsiders perceive Otis as quiet and undeveloped, offering limited public gathering spots—two sparsely staffed community centers, a gravel lot hosting occasional art fairs, and a hard-to-access riverbank where people sometimes fish.

Otis is situated in the Coast Range and is characterized by temperate mixed conifer rainforests with an annual precipitation of 2,484 mm and an elevation of 14 m.a.s.l. The region has mild, wet winters and short, dry summers. Fire naturally occurs on time scales of hundreds of years, often after periods of prolonged drought, thus most residents of Otis had little to no personal experience with wildfire. Because these are productive ecosystems with rapid fuel accumulation and fire-sensitive vegetation, fires can be large, high-severity, and stand-replacing. However, evidence suggests that there is extensive variability in fire frequency and size ([Johnston et al., 2023](#)). The Echo Mountain Fire (1,012 ha) occurred in Otis in September 2020, was driven by uncharacteristically high winds, and destroyed about half of the rural town's 1,241 structures, including 300 homes. The burn-scarred landscape contrasts with the densely treed, cooler areas untouched by fire ([Lincoln County Government, 2024](#)).

Engagement with Otis residents occurred at a community breakfast and regular food bank distribution events. Attendees, mostly elderly and white, were reserved but friendly. In contrast, Lincoln City held Hispanic heritage events at its cultural center, where Latine and white residents mingled. Observations and interviews suggest an unintentional social divide between white and Latine residents, despite mostly mutual positive regard.

Our larger wildfire community recovery research sampled other geographic and ethnic communities in Okanogan County, Otis, and different communities in Oregon and California. For this paper, we selected these sites because they represent distinct yet complementary wildfire recovery contexts. Pateros exemplifies a small agricultural town with a high proportion of Latine residents who were directly exposed to Washington's largest wildfire on record, making it analytically valuable for understanding how structural inequities

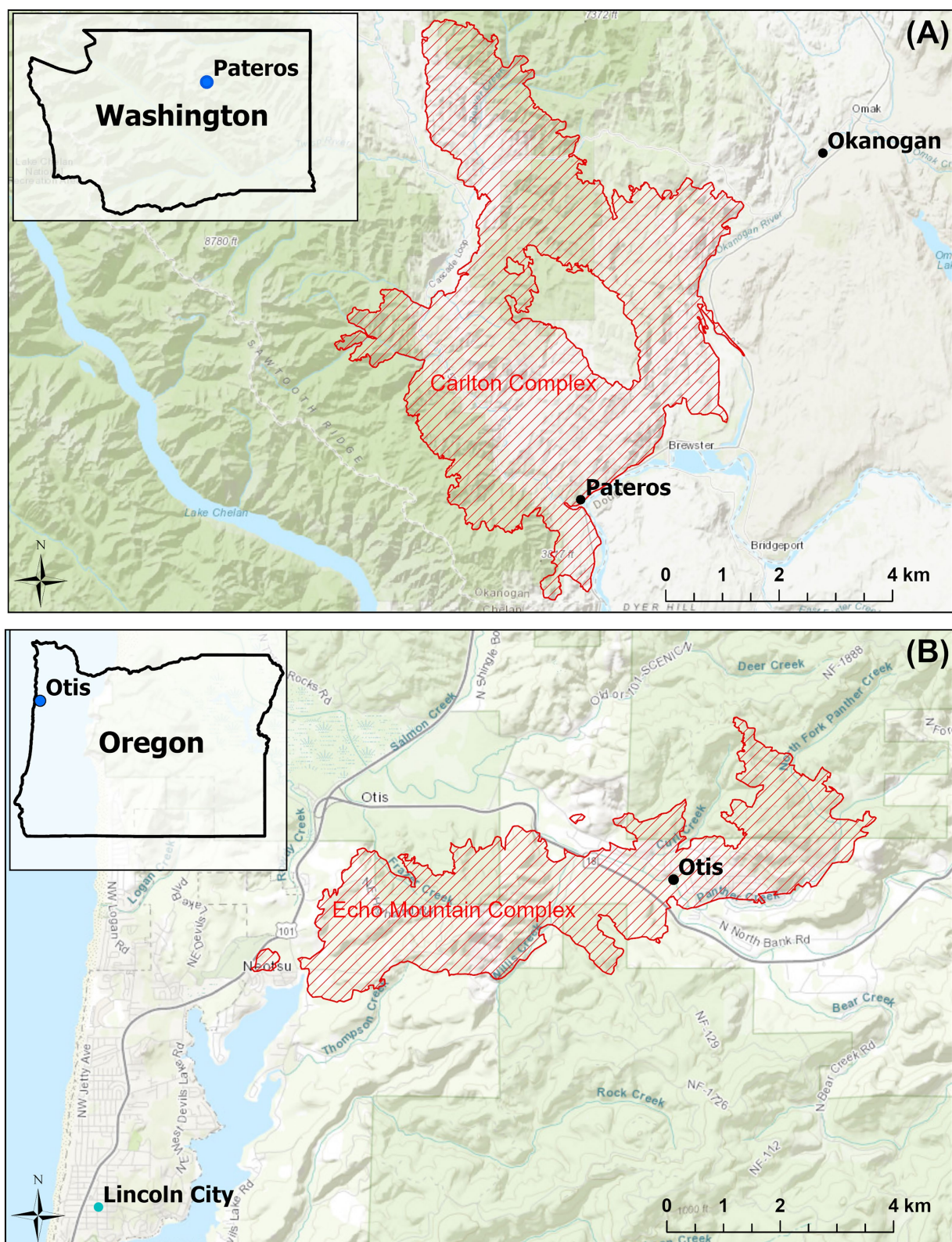


FIGURE 1

Research study areas and burn perimeters: (A) the Carlton Complex and Pateros, Washington, USA, and (B) the Echo Mountain Complex and Otis, Oregon, USA.

shape recovery in highly affected rural communities. Otis, by contrast, illustrates a dispersed, unincorporated community in Oregon's Coast Range where Latine households constituted a smaller proportion of

those impacted, but where existing partnerships facilitated access and trust. Taken together, the cases highlight both concentrated and more diffuse Latine wildfire recovery experiences in different ecological and

social settings, offering insights that extend beyond either location alone.

2.2 Research design

Research questions were designed to identify community capitals and investigate recovery experiences of wildfire-affected Latine communities (Table 1). The initial interview protocol was developed based on existing literature on disaster recovery indicators (Copeland et al., 2020; Cutter et al., 2014; Mayer, 2019) and Community Capitals (Flora et al., 2005; Emery and Flora, 2006) and was refined through a participatory process with community partners, including recovery organization employees and volunteers, wherein we discussed appropriate phrasing of questions and methods of inquiry suitable to a range of participant abilities. This approach ensured that the interview questions were relevant and culturally appropriate. Sample questions included “How did your community change due to the fire?” and “What resources or organizations helped or hindered during the recovery process?” The full interview schedule appears in the Appendix. Additionally, we used a trauma-informed approach (Hossain, 2022) to interact with and interview participants, emphasizing emotional safety and choice. For example, we allowed participants to proceed at their own pace and offered the option to skip any topics that felt distressing. The Oregon State University Institutional Review Board approved this research (HE-2024-997), including a verbal informed consent process, which better suited participants by minimizing risks related to documentation, aligning with cultural norms, and fostering trust among individuals with limited literacy or concerns about immigration-related repercussions.

2.3 Data collection

Data collection in Otis, Oregon, and Pateros, Washington, occurred from January to October 2024. Research activities included focus groups and semi-structured interviews, which were held in accessible community spaces, such as local schools (after hours) and community centers. One interview and all focus groups were conducted in Spanish by the primary author who has a C1 (Advanced) Spanish fluency level; one interview was conducted by multiple authors in English with occasional expressions in Spanish. We also engaged in participant observation (in English and Spanish) at community events (e.g., Cinco de Mayo) to further understand implicit aspects of community and help triangulate the data. Participation was voluntary, with all participants providing verbal informed consent. We employed a snowball sampling strategy, beginning with key informants identified through local recovery organizations and community networks to reach Latine residents. Eligible participants were adults (18+) who self-identified as Latino/a/e or Hispanic and lived in the area before, during, and after the respective wildfire. All participants’ countries of origin were Mexico, and they spoke Spanish as their first language. In Oregon, we included residents of coastal towns near Otis (i.e., Lincoln City, Newport) because of their familiarity with wildfire impacts and because of the small sample ($n = 4$) of Latine residents directly impacted by the Echo Mountain Fire. The total sample ($n = 35$) consisted of individuals aged 30–70; 19 women and 16 men. Participants were a mix of homeowners and renters with varying degrees of wildfire impact. A subset ($n = 4$ in Otis, $n = 1$ in Pateros) of participants experienced direct fire damage to their homes or property. Details are summarized in Tables 2, 3.

TABLE 1 Community capitals, definitions, and their applications to wildfire recovery (adapted from Flora et al., 2005).

Community capital definition	Applications to wildfire
Natural capital includes environmental resources such as land, water, and air.	Wildfire affects natural capital by altering forest resources, watersheds, and air quality from smoke, often requiring management interventions to return to more desirable conditions.
Cultural capital encompasses traditions, language, shared identity, and community supports that shape social cohesion and knowledge transmission.	Cultural capital can include Indigenous land management through prescribed burning, or language barriers or cultural differences that hinder communication of emergency information. Cultural capital can also include support structures that facilitate community functioning and wellbeing, such as healthcare systems.
Human capital refers to individual and collective skills, education, health, and other personal resources.	Individuals with strong educational backgrounds and professional skills may be better positioned to navigate wildfire recovery resources, access aid, and rebuild their lives, or help others to do so.
Social capital involves relationships, networks, and trust that facilitate cooperation and mutual support.	Informal networks can be lifesaving during wildfires, as information, shelter, and financial support are often shared among family, friends, and neighbors.
*Organizational capital reflects voice, power, access to governance, civic engagement, and institutional supports that facilitate community function.	Vulnerable communities often face barriers to political participation, such as limited representation in local government, distrust of authorities, or immigration-related concerns that discourage engagement. Thus, they may not receive equitable disaster aid, housing protections, or supportive policy changes.
Built capital consists of infrastructure, housing, and physical assets that sustain community functions.	Wildfires often destroy homes, displace residents, and damage essential infrastructure like roads, power lines, and water systems.
Financial capital includes economic resources, such as savings, wages, loans, and access to aid.	Limited personal finances or lack of assistance are major barriers to wildfire recovery; conversely, ample finances and access to assistance streamline recovery processes.

*Original CCF used the term ‘Political’ which we changed to ‘Organizational’ because political structure alone did not impact processes relating to having a voice, nor access to power, representation, or resources.

TABLE 2 Participants’ descriptive characteristics for Otis, Oregon, and Pateros, Washington.

Variable	Otis, Oregon (n = 2)	Lincoln County, Oregon* (n = 28)	Pateros, Washington (n = 5)
Gender	Female: 100% (2)	Female: 50% (14)	Female: 60% (3)
Median Age	45	54	46.5
Median Household Income	Missing**	Missing**	\$26,500
Foreign born	100% (2)	100% (28)	100% (5)
Language other than English spoken at home	100%	100%	100%
Hispanic or Latine	100% (2)	100% (28)	100% (5)
Homes Damaged or Destroyed	100% (2)	7% (2)	20% (1)
Evacuated	100% (2)	Unknown, ≥2	100% (5)

*Includes 28 participants from nearby coastal communities (Newport, Lincoln City, Seaside). **Based on observation and discussion, participants were at or below the median income for the county.

TABLE 3 County-level descriptive statistics.

Variable	Lincoln County, Oregon ¹	Okanogan County, Washington ²
Population	1,389 (Otis, unincorporated) 51,212 (County Total)	626 (Pateros) 44,942 (County Total)
Gender	51.7% female	48.5% female
Median Age	54	32
Median Household Income	\$61,314	\$60,293
Foreign born	5.4%	12.4%
Language other than English spoken at home	9.1%	18.0%
Hispanic or Latino	10.4%	21.2%
Date Fire Started	September 7, 2020	July 14, 2014
Area Burned	1,012 ha ³	103,643 ha
Number of Homes Destroyed	300 ³ (Otis) 300 (County Total)	150 ⁴ (Pateros) 357 ⁵ (County Total)

References: ¹U.S. Census Bureau (2024a) ²U.S. Census Bureau (2024b); ³Lincoln County Government (2024); ⁴Wildfire Today, 2014; ⁵OCLTRG (n.d).

We conducted three focus groups with a total of 35 participants to facilitate collective discussions on wildfire recovery experiences. Two focus groups were held in Oregon (each with 14 participants), and one in Washington (with five participants). Each Oregon focus group lasted 45 min, while the Washington focus group lasted 90 min. Sessions followed a semi-structured format with guiding questions (see [Appendix](#)) and were conducted in person at public community locations. To acknowledge participants’ time and contributions, each received a meal and a USD25 gift card.

We complemented focus group data collection by conducting two semi-structured interviews with Latine adults in Oregon to capture individual perspectives on wildfire recovery in greater depth. Interviews were from one-to-two hours long and followed a flexible structure to allow participants to elaborate on themes. Interviews followed a semi-structured format with guiding questions (see [Appendix](#)) and were conducted in person at public community locations. Lunch was provided to one participant; a coffee and a USD25 gift card were provided to the other.

Participant observation at community events and meetings throughout 2024 provided additional context on recovery efforts and social dynamics. We attended three events in Oregon—two at a community center (bilingual English Spanish) and one at a church

(Spanish). We attended three events in Washington—two at community centers and one at local fairgrounds (all in English). We took observational notes, focusing on community interactions, discussions about community recovery resources, and informal narratives about personal and community challenges.

2.4 Data analysis

For interviews and focus groups in Otis, we recorded detailed notes by hand, while the Washington focus group was audio-recorded with permission of the research participants. Audio recordings were then transcribed and translated into English using Sonix software and manually checked for accuracy. We then applied a mixed deductive/ inductive thematic coding approach based on the Community Capitals Framework ([Flora et al., 2005](#); [Emery and Flora, 2006](#)). Coding for specific community capital strengths and weaknesses was conducted iteratively, allowing for new emergent codes to arise from the data. Community Capitals were coded as either strengths or weaknesses with nested sub (or child) codes (themes) describing salient aspects of each community capital. For example, within the Human Capital Barriers Code were subcodes describing specific

human capital barriers, such as lack of knowledge or skills to assist in recovery efforts. Three researchers independently coded transcriptions and discussed differences in coding approaches until agreement was met. All transcription coding was performed using NVivo15 qualitative software (QSR International, 2023). Once broader research analysis is finalized, the codebook will be available upon request.

3 Results

During interviews and focus groups, participants discussed topics aligning with the Community Capitals Framework, with some capitals emerging more frequently as strengths and barriers in wildfire recovery. We focus on the four most salient capitals—Political (which we name Organizational), Human, Cultural, and Social—and examine their roles in Otis and Pateros' recovery. We re-named "Political" as "Organizational" Capital because many participants discussed governmental and non-governmental organizations involved in the recovery process, with little to no distinction for political structure as a relevant characteristic.

In this paper, we include the results of four capitals—Organizational, Human, Cultural, and Social—because they were discussed by at least 10% of the participant population from either one or both communities. Our analysis revealed that Financial Capital was deeply intertwined with other capitals; thus we do not analyze it as a separate capital but rather as it is embedded in other capitals. For example, a key discussion regarding the strength of community and government organizations was their ability to secure and distribute financial assistance (Organizational Capital). We also see Financial Capital at the individual level that leverages a persons' skills (Human Capital) and ability to rebuild (Built Capital), affects whether they receive or offer support to others (Social Capital), decide to take certain land management actions (Natural Capital), and accept various types of supports in the community (Cultural Capital). In this way, Financial Capital touches all other capitals. Table 4 summarizes our findings. Participant quotes appear as English translations first, followed by the Spanish original in italics. If only English appears, it is original.

3.1 Organizational capital

Organizational capital reflects voice, power, access to governance, and institutional support. Organizational capital was the most cited capital in our interviews, regarding both barriers and strengths. Organizational capital barriers included a lack of organizational capacity and assistance, lack of strong communications, issues with insurance, and unclear organizational processes (see Table 4).

A major organizational barrier was the lack of communication of fire information; residents in both towns expressed frustration that emergency alerts did not arrive in Spanish. Otis residents did not receive evacuation orders at all. One Pateros participant expressed this about alerts:

"But it arrives to you in Spanish? No. Then you go ask your kids, 'hey son, tell me what they're saying.' // *¿Pero que te llegue en español? No. Ahí vas, ahí vas con el hijo, 'ey hijo, dígame que dicen.'*

Another participant said she uses a translation app to understand alerts. Participants in both towns agreed that in the immediate aftermath of each area's respective fire, clear communications and temporary sheltering facilities were not available. In the fire aftermath, residents of both communities said that government assistance was slow to arrive. In Pateros, no official help came following evacuation, leaving residents to provide housing and other assistance for one another. When asked if support was available during and immediately following evacuation, one Pateros participant shared,

"At that moment, no. // *En ese momento, no.*"

Similarly, when asked what kind of governmental agency support there was immediately after the Echo Mountain Complex, one particularly talkative Otis resident quieted and paused to consider. She shook her head, and responded gravely,

"They did not do anything."

Within a few weeks of the Carlton Complex in Pateros, participants mentioned resource distribution available informally at the school, though they did not perceive this as an officially sanctioned support. They saw this informal support as equitable and accessible, regardless of ethnicity or language. One Pateros resident noted,

"Anyone who needed help was welcome and received whatever was available at the time. // *Todo aquel que necesitara ayuda era bienvenido y recibía lo que hubiese en ese momento.*"

In Otis, participants recalled that long-term governmental recovery efforts took nearly two years to materialize. In both towns, the perceived delay in governmental and other institutional support led residents to self-organize to meet their needs in the meantime.

In the months and years following the fires, many participants in Otis and Pateros who sought governmental assistance reported struggling to navigate the application process for aid, particularly through the Federal Emergency Management Agency (FEMA, 2011, 2016), which they describe as difficult to work with because of extensive paperwork, multiple denials, and a confusing process. One participant reported submitting seven applications to FEMA before being awarded any assistance. Some Otis interviewees reported that rental assistance was particularly difficult to obtain because their multi-family households did not fit eligibility criteria. Overall, many residents felt that both response and recovery assistance had been limited due to organizational capacity constraints that were present pre-fire but exacerbated post-fire (e.g., firefighting equipment shortages, service organizations closing due to lack of funds). This reflects in larger community processes, particularly in Pateros, where residents felt that their voices were not heard in funding allocations the town made to support improved road infrastructure following the Carlton Complex.

Furthermore, amidst conversations with recovery workers in Okanogan County, Latines (and immigrants from other regions) were identified as a distinct group with unique wildfire recovery needs—particularly Spanish language interpretation, though discussions on this topic were limited. Latine involvement in formal recovery or mitigation efforts were minimal—for example,

TABLE 4 Salient community capitals identified through interviews and focus groups in Pateros and Otis.

Community capital	Subtheme	Description	% that a subtheme is present in total transcript content per study area*	
			Pateros	Otis
Organizational Capital– Barriers	General organizational barrier	Perceives government and non-governmental processes as dysfunctional or going in the wrong direction, thwarting the recovery process	1	1
	Insurance issues	Lack of affordable insurance or payouts	10	2
	Government-specific barrier	Specific city, County, State, or Federal governments, processes, or regulations pose a barrier to recovery	3	1
	Inequities	Programs or processes that favor some over others	1	2
	Lack of capacity or assistance	Lack of financial or other supports; Lack of organizational assistance; Limited staff or other resources, burnout, weak leadership	6	2
	Lack of strong communications	Lack of strong information or communication networks: emergency alerts, social media; Miscommunications	2	4
	Unclear process	Confusion around aid process; Lots of ‘red tape,’ multiple tries at, or delays in getting assistance; lack of timely aid or other supports	3	1
	Lack of engagement	Feel their voice has not been heard, or that organizations have not supported their community	6	0
	Subtotal, barriers		32	13
Organizational Capital– Strengths	General strength	Perceives government and nongovernmental processes as functioning or going in the right direction, enabling the recovery process	2	2
	Ability to secure insurance	Insurance is accessible, affordable, or provides necessary support	1	0
	Effective coordination	Internal organizational systems are functioning well, collaboration and communication are present and helpful	0	1
	Government-specific strength	Specific city, County, State, or Federal governments, processes, or regulations that enable aid or recovery	0	<1
	Strong communications	Strong information or communication networks: emergency alerts, social media, etc.	<1	<1
	Subtotal, strengths		4	5
Organizational Capital	Total (54)		36	18

(Continued)

TABLE 4 (Continued)

Community capital	Subtheme	Description	% that a subtheme is present in total transcript content per study area*	
			Pateros	Otis
Human Capital–Barriers	Health sensitivities	Poor health, lack of mobility, sensitive to smoke	0	1
	Lack of knowledge or skills	Not educated or knowledgeable about programs or adaptations; having language barriers or technical understanding barriers	0	1
	Lack of financial self-sufficiency	Low income, lacking insurance or other financial resources; does not have adequate finances to cover needs	1	1
	Mental health issues	Trauma, PTSD, emotional triggers, substance abuse	3	7
	Subtotal, barriers		4	10
Human Capital–Strengths	Strong leader	Someone who works tirelessly in the community for good	1	1
	Knowledge or skills	Educated, knowledgeable, or resourceful about programs, adaptations, utilizing existing resources, or working together	0	1
	Financial self-sufficiency	High income, insurance, and other financial resources	1	0
	Mental fortitude	Managing one's mental health, ability to work things through	0	6
	Subtotal, strengths		2	8
Human Capital	Total (24)		6	18
Cultural Capital—Barriers	Crime	Presence of criminal activity, lack of safety	1	1
	Lack of community supports	Lack health care services, have a weakening economy or fewer jobs, lack affordable housing	8	0
	Negativity toward other demographics	Negativity toward other groups in the community, demographic consistency, and/or diversity	1	2
	Subtotal, barriers		10	3
Cultural Capital—Strengths	General supports	Good health care, strong/growing economy, affordable housing	1	6
	Positivity toward other demographics	Positivity toward other groups in the community, demographic consistency, and/or diversity	1	2
	Subtotal, strengths		2	8
Cultural Capital	Total (23)		12	11

(Continued)

TABLE 4 (Continued)

Community capital	Subtheme	Description	% that a subtheme is present in total transcript content per study area*	
			Pateros	Otis
Social Capital—Strengths	General strength	Supports in the form of items (e.g., money, other donations, a place to stay)	6	1
	Bonding supports	Friends, family, close neighbors helping one another	0	3
	Bridging supports	Help from distance neighbors, co-workers, employers, intra-community volunteers	0	2
	Linking supports	Individuals that link survivors to governmental or organizational assistance	4	2
Social Capital	Total (18)		10	8

*Content includes focus group and interview transcripts and notes from community events.

none attended the Community Wildfire Protection Plan (CWPP) public meeting in Pateros in 2024, which was held in English. The Pateros meeting was one of several community meetings in Okanogan County to engage the public in shaping the CWPP—a planning document for wildfire preparedness (Okanogan County, 2024; OCLTRG, 2025). However, a nongovernmental organization focused on multicultural family education in Chelan county (neighboring Okanogan county) offered wildfire preparedness courses in Spanish in 2024, and these were available online to Okanogan county residents. Similarly, Otis had an organized Latine recovery group actively addressing needs, and the county’s emergency management office recognized but struggled to meet the need for bilingual communications and multicultural engagement.

In both communities, another major challenge was the high rates of underinsurance; even those with insurance reported that payouts were often insufficient to cover rebuilding costs. One Otis participant said that even after the payout,

“I was left with nothing. // *Me quedé sin nada.*”

Another concern was the rising cost of insurance prohibited many from having adequate coverage. As one Pateros participant described,

“The insurance payment went up because now they say that I am at risk and even more so because of the drought. // *Me subió el pago de la aseguranza porque ellos dicen que estoy en riesgo y más porque como está la sequía.*”

Organizational strengths have emerged with time since the Carlton Complex and Echo Mountain Complex, demonstrating potential increased adaptive capacity to respond more effectively to future wildfire events, particularly in improved emergency response, coordinated aid efforts, and community-driven initiatives. For example, in Pateros, participants perceived the firefighting response as being significantly improved in efficiency since the Carlton Complex. Several fires have occurred since the 2014 event, and as one participant stated:

“The fire last year, the one that happened in [a nearby town].... [In the 2014 fire,] [i]t took them a long time to decide beforehand whether the plane or the helicopter would come in. And now, immediately... the aircraft goes in with the flame retardant.... [This time they quickly] went in and dealt with it. // *El incendio el año pasado, el que acaba de pasar en [un pueblo vecino].... [En el incendio del 2014,] se tardaron antes mucho en decidir si entraba el avión o el helicóptero. Y ahora, inmediatamente... entre el avión con el retardant.... Ahora sí lo entró.*”

Other participants agreed that there is now better coordination among firefighting agencies, yielding a more effective response.

In Otis, while some support was provided immediately, participants indicated that the most impactful assistance emerged with time after the Echo Mountain Complex. Within two weeks of the fire, multiple aid organizations were available in a single, convenient location, allowing residents to address multiple needs in one stop. However, as one participant described, the problem with those

resources was that she did not understand or believe they were for her because of the trauma of the recent fire. She said,

“I didn’t believe they were for me... I was confused and sad. // *No creía que eran para mí... estuve confusa y triste.*”

Her emotional state prevented her from taking advantage of immediate opportunities for help. However, this participant has taken advantage of available support in the ensuing years. One community organization, spearheaded by a Latine leader, played a key role in recovery and has since evolved to address broader community needs, demonstrating adaptability and long-term commitment to local well-being, as well as promoting a greater sense of organizational trust among Latines. This organization’s initial success may be attributed, in part, to the financial infrastructure established by a predecessor recovery group formed in the immediate aftermath of the Echo Mountain Complex. By maintaining continuity in its 501(c)(3) status—albeit under a different trade name but with the same legal and financial history—the newly established Latine organization was able to leverage the predecessor’s established organizational and financial credibility. Additionally, in Otis, various organizations coordinated well to provide assistance. Government-specific assistance, while slow to arrive, has made an impact; the county’s replacement of damaged septic systems is one example. In Pateros, participants noted that the City’s installation of pumps and hydrants was a positive organizational support. In both communities, emergency communication improved; an app provides emergency alerts (in English), and social media is a tool for sharing information.

3.2 Human capital

Human capital refers to individual and collective skills, education, and health. Human capital was the second-most cited capital, particularly in Otis, with barriers such as mental health issues reported frequently.

Significant human capital barriers continue to impact recovery, particularly in terms of health issues related to seasonal smoke and air quality impacts, lack of financial self-sufficiency, and mental health struggles. Mental health challenges emerged as the greatest human capital constraint. In Pateros, residents felt the immense shock of witnessing a quarter of the town burn. One says,

“You are in shock in one moment... and many people take a long time to recover. // *Te quedas en shock en un momento... y a mucha gente le toma mucho tiempo recuperarse.*”

Additionally, anxiety resurfaces whenever new fires occur. For example, one participant discussed a family member’s reaction a year after the Carlton Complex (2014) when the Okanogan Complex (2015) started:

“It affected us mentally because my sister-in-law, who was [living] with me that year, panicked and became in a bad way. She wanted us to leave quickly before the fire started. // *Nos afectó mentalmente porque mi cuñada que tenía en ese año conmigo, ella entró en pánico y ya se puso mal. Quería que nos fuéramos rápido antes de que, apenas empezando el incendio.*”

From 2014 to years later, emotional reactions to the trauma continue. In both communities, residents rarely discuss mental health struggles. As one Otis resident explains:

“No one is talking about this or helping with it. Our culture doesn’t talk about it; it’s seen as an *enfermedad* [illness] or ‘oh, you’ve gone crazy.’”

Similarly, in Pateros, one participant explained, with nods of agreement from others:

“We know people [that were affected], but we never ask them ‘Hey, and, did you get some help?’ // *Conocemos a gente, pero nunca les preguntamos, ‘Oye, y, ¿Encontraste algún apoyo?’*”

Still, they recognize that getting mental health support can help:

“If you talk, it hurts less. // *Si platicas, duele menos.*”

In both communities, years later, trauma still resurfaces in everyday moments: a power outage during a storm caused an entire family to sleep in their living room together out of fear, while a small kitchen fire in the neighborhood prompted a child to pack an emergency go-bag. Some fire survivors turned to drinking alcohol and smoking marijuana as a coping mechanism “to forget what happened,” leading to addiction in some cases. Even years later, reflecting on the fire and the ongoing recovery process brought many to tears, showing that the emotional weight of the fire remains. Fear, both of future emergencies and of discussing mental health openly, continues to be a barrier to long-term emotional healing and preparedness for future disasters.

Both communities demonstrated human capital strengths, particularly in leadership, self-sufficiency, and mental resilience. Mental fortitude—the ability to learn and grow despite adversity—is a defining strength, particularly in Otis (Table 4). One participant shared a sentiment that resonates in both communities:

“There’s lots to be learned from this; from [tough] circumstances one can learn a lot. // *Aprende mucho de eso, de las circunstancias aprende uno mucho.*”

Though recovery has taken years, another Otis resident reflects,

“What recovery means to me is taking the long way through to *superar algo* [overcome something].... You need to adapt, and you won’t be the same as before.”

An appreciation for adaptation and change energized community members to make a difference in their families and communities, which one said helps them avoid depression:

“If you do not speak up and do something, there’s too much depression.”

Community events played a quiet but essential role in mental health support, offering spaces for connection and self-care without explicitly labeling them as such—since acknowledging mental health directly might deter attendance. For example, as a result of the mental

health issues of the wildfire, a grass-roots effort for a Spanish-language support group for Latina women is forming in Otis, representing a significant step toward addressing mental health needs in a culturally responsive way.

3.3 Cultural capital

Cultural capital encompasses traditions, language, and shared identity that shape social cohesion and knowledge transmission. It can also include the “feel” of a community, evidenced by shared values, or a sense of pride, belonging, or inclusion. Cultural capital was frequently discussed in interviews (Table 4) and formed part of participants’ definition of *community*. For example, defining community along the lines of a shared linguistic heritage, one Otis resident shared, and others nodded agreement, that:

“What unites the Hispanic community here is the language. // *Lo que nos une a la comunidad hispana es el idioma.*”

Both cultural capital strengths and barriers were identified. One substantial cultural capital barrier was a lack of community support systems (e.g., healthcare facilities, affordable housing and food, access to credit). One Pateros participant explained:

“There are no new people, new teachers, coming in. There is no availability of housing to say, ‘hey, I want to rent a house.’ Perhaps there is none, and if there is, it is very expensive. // *No hay gente nueva, maestros nuevos, que vienen. No hay disponibilidad de viviendas que digas, ‘oye, yo quiero rentar una casa.’ Quizás no hay y si las hay es muy cara.*”

Accordingly, there was skepticism toward new, wealthier residents, likely linked to concerns over gentrification. Latine participants worry that they will not be able to keep up with the rising costs of living that wealthier residents can afford, thus potentially pushing them out of the few available rentals.

Other cultural capital barriers in both communities were theft and experiences of prejudice. In Otis and the surrounding area, anti-immigrant sentiment led to direct verbal attacks, though these were unusual. One Otis participant said they had heard comments like, “Go back to your country.” Additionally, within healthcare settings, doctors sometimes dismissed Latinas, reducing their health concerns to stereotypes about “overweight Latinas” rather than engaging with the real systemic and medical issues. These experiences create obstacles to a sense of belonging and inclusion, fundamental to cultural capital.

In contrast, both communities described strong cultural capital strengths rooted in a deep connection to place and shared traditions. Residents generally appreciated both areas’ tranquility, beauty, and safety. One Otis participant’s description of their community reflects cultural capital strengths:

“It’s patient, tranquil—there’s little crime or homelessness. // *Es paciente, tranquilo, no hay mucha delincuencia o vagabundo.*”

In Otis, local events provide space for a collective history of Mexican heritage. For example, many residents attend *Cinco de Mayo*, Children’s Day, and Day of the Dead celebrations held at the local

community center throughout the year. They appreciate the mixing of cultures and languages in their towns, seeing it as a positive aspect of community life, not a source of division. Additionally, intergenerational support is evident in the care and concern for elders during evacuation from wildfire or other hazards more generally. One participant shared:

“We need to be aware of how this all affects older folks and the help they need. In the community where I live, there are elders, like 80 years old, and some of them have heart problems or other physical limitations. We said, ‘we can’t leave [evacuate] before making sure these people, our neighbors, know what to do.’ // *Debemos ser conscientes de cómo todo esto afecta a las personas mayores y de la ayuda que necesitan. En la comunidad donde vivo hay personas mayores, de unos 80 años, y algunas tienen problemas cardíacos u otras limitaciones físicas. Dijimos, ‘No podemos irnos sin asegurarnos de que estas personas, nuestros vecinos, sepan qué hacer.’*”

In addition to the above strengths, each town adopted an informal slogan in the wake of their respective fires, as many wildfire-affected communities do to express solidarity: “Pateros Strong” and “Otis Strong.” Even though the messages were in English, Spanish speakers said them with pride. In Otis, signs and benches with this slogan were still visible five years after the Echo Mountain Complex. This messaging lent a sense of social cohesion and shared purpose, contributing to cultural capital in these communities.

3.4 Social capital

Social capital involves relationships, networks, and trust that facilitate cooperation and mutual support, including the delivery of essential goods and services. Notably, social capital emerged only as a strength, with no significant barriers reported in either community (see Table 4). Social capital, like cultural capital, was intertwined with participants’ definitions of *community*. As one Pateros participant defined community:

“It’s support, unity. // *Es apoyo, unión.*”

Other Pateros residents agreed and provided examples of how individual and family needs are met through community generosity and selflessness.

Both communities exhibited strong bonding support—friends, family, and close neighbors helping one another—in the immediate aftermath of their respective fires, wherein informal networks, such as family members and friends offered clothes, food, and shelter before official aid arrived. In Otis, many residents echoed the sense that bonding support continues:

“There is more mutual aid, people are more connected, people are helping each other. // *Hay apoyo mutuamente, están conectados, están ayudando.*”

Another resident noted,

“You see one another more. People help more.”

Participants directly correlated the bonding support they felt to the lack of vegetation after the Echo Mountain Complex. They highlighted how the fire physically changed the landscape—burned trees no longer obstructed views—leading to increased visibility and thus, deeper neighborly connections.

In addition to friends, family, and neighbors lending support, bridging social capital was evident in the involvement of community member volunteers working independently and through churches and community centers to organize cleanup efforts and distribute donations. For example, Otis residents staffed the local Grange to provide food and household item donations for those in need. Linking social capital was evident through institutional support such as local organizations and select governmental programs providing bilingual support and connecting residents to financial aid, housing assistance, and logistical recovery services. For example, one Otis participant said that a Spanish-speaking employee at a state-funded service organization was helping her to collect the necessary documentation and fill out an application for Oregon's *Homeowner Assistance and Reconstruction Program* (HARP) assistance.

Social capital—particularly bonding and bridging—was most notable in early weeks of wildfire recovery, but some aspects of it have sustained over time. For example, though the increased connection people found among their community members in the immediate aftermath of the Carlton Complex and Echo Mountain Complex waned slightly over the years, an enduring sense of trust that one's community (e.g., friends, family, neighbors, co-workers) will be there for them in times of crisis persists. The wildfires thus became a unifying social force. As one participant observed:

“The population came together. // *Se unió la población.*”

Additionally, the governmental and nongovernmental organizations providing linking social capital in the form of housing or other assistance continue to be present, particularly in Otis.

4 Discussion

The wildfire recovery experiences in Otis and Pateros highlight the complex ways that community capitals shape disaster recovery outcomes, a perspective echoed in previous research (Koch et al., 2017; Quinn et al., 2022). Participants from both communities mentioned all seven capitals of the Community Capitals Framework (Flora et al., 2005; Emery and Flora, 2006). The predominance of Organizational, Human, Cultural, and Social capitals highlights several key dynamics. First, organizational processes—both governmental and nongovernmental—were critical in shaping recovery outcomes, acting as either facilitators or barriers when culturally misaligned or under-resourced. Second, mental health emerged as a major dimension of recovery, with persistent, untreated trauma affecting participants' lives long-term and grassroots-level efforts providing culturally relevant support. Third, the influence of cultural and social factors emphasizes that shared values, community identity, and informal networks can either strengthen or strain recovery, depending on how they are mobilized and sustained over time.

The focus on organizational capital barriers and strengths underscores the critical role that governmental and non-governmental systems play in disaster response and long-term recovery. Emergency communication failures, underinsurance, confusing aid processes, and

limited institutional engagement with Latine residents echoed concerns documented elsewhere (Aguirre, 1988; Moore Gerrety, 2015; Trujillo-Pagán, 2007; Villarreal, 2023). Official emergency communications are often not prioritized among Latine populations, who instead rely on informal communications, which may prolong their evacuation and preparation activities and put them at further danger (Muruthi et al., 2025; Trujillo-Pagán, 2007). Since the Carlton Complex and Echo Mountain Complex, both Lincoln and Okanogan counties developed emergency alert systems with Spanish-language capabilities, indicative of steps toward recognition equity (Baker et al., 2024; Meerow et al., 2019). Yet participants' unfamiliarity with these alerts suggests limited on-the-ground adoption, particularly in Pateros, where recovery efforts have had more time and a larger Spanish-speaking population. Although Spanish resources exist on county emergency websites, accessing them still requires English proficiency, limiting their effectiveness and illustrating that equity improvements remain uneven in practice (Wiles and Kobayashi, 2020; Sloan et al., 2025).

Additionally, as Russo et al. (2024) highlight, wildfire management and recovery efforts often reflect dominant narratives that shape whose knowledge and experiences are legitimized in decision-making. The absence of Latine voices in formal recovery discussions in Pateros reflected these power imbalances, reinforcing other scholarly work on the exclusion of vulnerable communities from formal recovery planning and governance processes (Auer, 2021; Cuervo et al., 2017; Meerow et al., 2019; Méndez et al., 2020; Trujillo-Pagán, 2007). These omissions highlight a need for knowledge co-production approaches that actively integrate multiple understandings of wildfire impacts and solutions (Russo et al., 2024; Tran and Kim, 2024).

Organizational efforts evolved over time: early responses were often slow and disconnected from community realities, as seen in federal aid eligibility criteria that limited support for multi-family living arrangements—barriers rooted in racialized systems of disaster governance (Villarreal, 2023). Similarly, federal disaster aid, while potentially substantial, is largely inaccessible to low-income and ethnic minority households due to program designs favoring middle-class homeowners and complicated aid applications (Bolin and Stanford, 1998). Still, over time in Otis and Pateros, some local organizations developed culturally responsive support structures, illustrating how organizational capital can adapt post-disaster when grounded in community needs and experiences (Méndez et al., 2020; Villarreal, 2023), particularly when trusted community-based and non-governmental organizations partner to provide support (Bolin and Stanford, 1998; Cuervo et al., 2017).

Human capital played a central role in shaping emotional recovery. Mental health issues, often stigmatized or left unaddressed within the community (Caplan, 2019; Mascayano et al., 2016), continued to affect daily life years after each fire. Stigmas are often compounded by other issues in seeking care in post-disaster contexts, such as fears around immigration status, cultural isolation, and the inaccessibility of formal institutional aid more broadly (Méndez et al., 2020; Sloan et al., 2025; Villarreal, 2023). The absence of culturally appropriate mental health services exposed recognition and distributive inequities, paralleling broader patterns where Latine communities face systemic gaps in care (Alegría et al., 2002; Méndez et al., 2020). However, informal support initiatives, such as the emerging women's Spanish-language group in Otis, exemplify how residents are building new, culturally relevant forms of human capital,

similar to the informal networks of care that African American women utilized for support post-Katrina (Litt, 2012).

Cultural capital played a significant role in shaping strengths and barriers in these communities, both in terms of broader aspects of community life and in specific aspects of recovery. Recognition of inequities was evident in the stereotyping of Latinas in healthcare settings, where their concerns were dismissed—echoing broader patterns of cultural misrecognition that undermine trust and access (Caplan, 2019; Mascayano et al., 2016). In contrast, public celebrations of Mexican heritage in Otis served as counterpoints to exclusionary experiences, affirming that recognition of equity is not only institutional but also socially constructed within the community (Leach et al., 2018; Auer, 2021). Participants in both communities noted the cultural equality of access to informal, immediate resources and support (with the exception of the participant whose emotional state prevented this), contrasting with broader patterns of racialized disaster response inequities in other research (Leach et al., 2018; Villarreal, 2023).

Social capital surfaced overwhelmingly as a strength, reinforcing past research on the importance of informal support networks in post-disaster settings (Aldrich and Meyer, 2015; Nakagawa and Shaw, 2004) and illustrating ways in which social support helps disaster survivors counteract institutional limitations and inequities (Villarreal, 2023). Similar to what scholars found after southern Oregon wildfires (Sloan et al., 2025), bonding ties among family, friends, and neighbors offered critical early support. Bridging and linking capital, such as connections to aid organizations (e.g., the Otis Grange and a Latine-focused non-profit), helped sustain recovery over time. Similarly, Nakagawa and Shaw (2004) found that after two earthquakes affected Asian urban centers, social capital (e.g., community member trust, networks, and participation) and healthy leadership contributed greatly to a “speedy and satisfying recovery” (p.28). Still, while social capital can provide essential buffers, it cannot fully compensate for structural inequities embedded in formal aid systems and governance (Leach et al., 2018; McDermott et al., 2013; Villarreal, 2023).

Taken together, the evolution of capitals over time was evident. Organizational capital evolved through improved emergency coordination and the emergence of more culturally grounded support organizations. Human capital evolved as individuals sought informal mental health support outside of traditional systems. Social and cultural capitals initially mobilized informal support and later sustained a sense of community cohesion. These processes highlight that recovery is not a static return to pre-disaster conditions, but a process shaped by evolving strengths, persistent inequities, community-driven efforts, and social realities (Cuervo et al., 2017; Cutter et al., 2014; Cretney, 2016; Russo et al., 2024). These community-level experiences resonate with national patterns of growing wildfire scale and intensity (Weber and Yadav, 2020; Iglesias et al., 2022), particularly in WUI communities where losses have been disproportionately high (Kramer et al., 2019; Caggiano et al., 2020). This alignment underscores that the inequities identified in Otis and Pateros are not isolated but situated within broader wildfire dynamics that increasingly shape recovery challenges across the United States.

The findings of this study support growing calls to redefine recovery and resilience to center social equity and systemic change. Traditional frameworks that conceive recovery as a return to pre-disaster conditions (Smith and Wenger, 2007) and resilience as the ability to “bounce back” (Holling, 1973) risk reinstating the very

vulnerabilities that exacerbate disaster impacts (Cretney, 2016; Cutter et al., 2014). Recovery should instead be understood as a process that can address pre-existing inequities, strengthen local capacities, and foster community self-determination. Similarly, resilience must be redefined to encompass cultural cohesion, emotional well-being, political inclusion, and equitable access to resources (Côté and Nightingale, 2012; Lukasiewicz, 2020), moving beyond technical or infrastructural measures alone. This study shows that resilience in wildfire-affected Latine communities is not only about rebuilding structures, but also sustaining and expanding organizational, human, cultural, and social capitals to meet needs and overcome systemic barriers. By examining these shifts through an equity lens, this research contributes to a growing body of scholarship advocating for disaster recovery models that integrate community-based strengths with systemic justice (Lukasiewicz, 2020; Tran and Kim, 2024). It underscores the need for disaster governance frameworks that are linguistically inclusive, culturally responsive, and grounded in the lived experiences of vulnerable communities (Auer, 2021; Cuervo et al., 2017; Meerow et al., 2019; Lukasiewicz, 2020; Tran and Kim, 2024; Méndez et al., 2020; Sloan et al., 2025; Villarreal, 2023; Baker et al., 2024).

4.1 Policy and organizational recommendations

Federal frameworks such as FEMA’s *Whole Community Approach* and the National Disaster Recovery Framework (FEMA, 2011, 2016) have articulated important principles of equity and inclusion in disaster response and recovery. These models emphasize the need for collaborative, community-driven planning that engages all sectors of society, particularly those most vulnerable to harm. However, their implementation has often been uneven, and their influence on ground-level practice is variable—especially in times of shifting political and administrative priorities.

Our findings reveal that in communities like Otis and Pateros, Latine residents continue to face systemic barriers, including limited access to linguistically inclusive information, exclusion from formal preparedness processes, and challenges navigating aid systems. These issues suggest a persistent disconnect between the intent of national policies and the lived realities of those most affected by disaster.

Rather than focusing solely on refining federal policy, it is increasingly important to consider how core principles of equity, access, and inclusion can be operationalized at the state and local levels. For example, multilingual emergency alerts must be reliably delivered across platforms. Disaster planning processes—such as Community Wildfire Protection Plans and Natural Hazard Mitigation Plans—should incorporate meaningful language access, culturally responsive outreach, and equitable participation. Aid eligibility criteria should reflect the diversity of household arrangements in immigrant communities. Community-based mental health support programs, particularly those that are bilingual, peer-led, and trauma-informed, can provide accessible and trusted care.

Finally, sustained investment in local organizations that foster culturally grounded recovery and inclusive governance can enhance coordination, improve service delivery, and promote equity in resource distribution after disasters. These local strategies can carry forward the intent of federal and other equity frameworks, even when national implementation is inconsistent. By emphasizing these

adaptable, community-based approaches, we highlight pathways for improving disaster recovery that remain relevant across changing political and institutional landscapes.

5 Conclusion

This cross-sectional case study highlights the multifaceted role of community capitals in shaping the wildfire recovery experiences of Latine residents in Otis (4 years after the fire) and Pateros (10 years after the fire). Findings were similar across communities and illustrate strengths and barriers unique to this population, including the crucial role of social capital in providing immediate aid, the persistence of procedural and distributive inequities in formal recovery efforts, and the fortitude fostered through cultural identity and community cohesion. While strong informal networks helped mitigate disparities, structural barriers—such as limited bilingual emergency communications and mental health support, and exclusion from decision-making—hindered equitable recovery outcomes.

The smaller sample size in Pateros compared to Otis may limit the generalizability of findings. Similarly, few participants were directly impacted by wildfire damage to their homes, which we believe contributed to less pronounced discussion of Built Capital or rebuilding. This is a particularly notable difference from other studies that found housing challenges to be major contributors to recovery experiences in other vulnerable, disaster-affected communities (e.g., Bolin and Stanford, 1998; Haubert Weil, 2009; Peacock et al., 2019). However, the data still provide valuable insights into broader, shared recovery challenges and the need for equity-focused interventions.

This research provides insight into how community capitals evolve post-disaster, but comparative studies with other vulnerable populations would further enhance understanding. Examining recovery experiences across different communities—such as Indigenous and other ethnic or immigrant populations—could clarify common barriers and inform more inclusive policy solutions. By centering equity in disaster recovery frameworks, policymakers and organizations can work toward more just and resilient outcomes for all communities affected by wildfire.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Oregon State University Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The ethics committee/institutional review board waived the requirement of written informed consent for participation from the participants or the participants' legal guardians/next of kin because we obtained verbal informed consent, which better suited participants by minimizing risks related to documentation, aligning with cultural norms, and fostering trust among individuals with limited literacy or concerns about immigration-related repercussions.

Author contributions

AT: Project administration, Formal analysis, Methodology, Data curation, Investigation, Software, Writing – original draft, Conceptualization, Writing – review & editing. JT: Data curation, Project administration, Formal analysis, Conceptualization, Methodology, Writing – review & editing, Investigation, Funding acquisition, Software, Supervision. LE: Writing – review & editing, Conceptualization, Project administration, Supervision, Funding acquisition. AS: Supervision, Conceptualization, Writing – review & editing, Funding acquisition. NH: Conceptualization, Formal analysis, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fhumd.2025.1620541/full#supplementary-material>

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Appendix

Interview Guide

1. Tell me about the community. What does community mean to you here?
2. In what ways is your community the same as it was before the fire?
3. In what ways is your community different now?
4. What was helpful in your (or your community's) recovery?
5. What was unhelpful in your (or your community's) recovery?
6. What organizations or resources did you or others in your community use in your recovery?
7. What are some lessons learned?
8. What do you think the future holds for this community in the next ten years? What would you like it to hold?
9. What else do you want to share about you or your community's recovery?

Demographic Questions.

1. What is your zip code?
2. What is your age?
3. What is your gender? Circle one: Male/Female/Non-binary/Prefer not to say/Other (please describe).
4. How do you identify...(see below)?
 - a. LGBTQ2S + or other non-conforming identity? Circle one: Yes / No.
 - b. Ethnicity/race: (please describe).
5. What is your country of origin?
6. Are you employed (circle one).... Full time // Part time // Retired // or Other (please describe):
7. What is your average annual income (estimated to the nearest \$10,000)?
8. Are you a veteran? Circle one: Yes/no.
9. Are you disabled? Circle one: Yes/no.
10. Is there anything else you wish to report?