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Indigenous Stewardship and Forest Management: Evaluating California's Strategic Plan for
Expanding the Use of Beneficial Fire

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by

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Abstract

In recent years, wildfires of increased frequency, magnitude, and destruction have plagued California, risking lives, property, and ecosystem health. The development of intensifying fire conditions can be traced through the history of California statehood, with Euro-American fire suppression techniques replacing the prescribed burning and traditional ecological knowledge used by Indigenous people to steward ecosystems. Despite waning fire resilience and biodiversity, California fire policy remained staunchly in favor of fire suppression outside of limited allowances for government-led prescribed burns, enforcing legal barriers to Indigenous stewardship and cultural burns through the 21st century. However, recent wildfire destruction prompted the 2022 “California’s Strategic Plan for Expanding the Use of Beneficial Fire” (“Strategic Plan”), which reversed longstanding suppression-dominated fire management and sought to include Indigenous and non-government practitioners as partners in implementing prescribed burns across California. Although the “Strategic Plan” incites drastic changes, a comparison between the “Strategic Plan” and “Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions” reveals detrimental oversights. The state government’s failure to create policies ensuring ethical partnership with Indigenous people and repeal policies hindering non-government participation impairs the ability of the “Strategic Plan” to guide extensive utilization of prescribed fire.

Introduction

In 2021 alone, 2,495,889 acres were burned in California (“2021 Incident Archive,” 2021). This burn area is possible through increasing occurrences of large, high-intensity fires that produce hazardous smoke levels, cost billions of taxpayer dollars, and destroy vital ecosystems (California Wildfire and Forest Resilience Task Force [Task Force], 2022). For example, one 2020 wildfire alone destroyed 10% of the world’s mature giant sequoias population. The rise of large, high-intensity wildfires can be traced through California's history, following changes in landscape management. Historically, Indigenous people used prescribed burns to steward the land. After colonization, Euro-Americans restricted Indigenous stewardship, substituting prescribed burns with fire suppression. The subsequent years of forced fire suppression—supplemented by rising temperatures and drought conditions—caused wildfires to grow in intensity, frequency, and size. These high-intensity fires produce soil carbon and microbe respiration effects that persist for decades, reducing the effectiveness of soil in sequestering carbon and providing nutrients to plants. However, intentional use of low-intensity fires (prescribed burns) can reduce the risk of destructive wildfires, increase fire resilience, and improve biodiversity.

Currently, the official state government response to worsening fire conditions includes the January 2021 “California’s Wildfire and Forest Resilience Action Plan” and the March 2022 edition “California's Strategic Plan for Expanding the Use of Beneficial Fire” (“Strategic Plan”). The “Strategic Plan” sites the successful protection of the Giant Forest in Sequoia National Park and other communities during both the Caldor and KNP Complex Fires as the driving force behind the newfound dedication to creating programs, policies, and regulations that will ease the most significant barriers to utilizing prescribed burns (Task Force, 2022).

To successfully execute current state policy and break the cycle of fire suppression, restoring Northern California's degraded forests necessitates collaboration with local Indigenous tribes and organizations, allowing local Indigenous people to steward their ancestral lands. California's Strategic Plan for Expanding the Use of Beneficial Fire demonstrates a historic shift in California state fire management. However, evaluation through prior critiques in "Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions" ("Good Fire") demonstrates how the "Strategic Plan" fails to repeal policies undermining expansive utilization of prescribed burns or foster ethical partnership with Indigenous organizations and tribes. Instead, the "Strategic Plan" reinforces inculcable and unrestricted government control in ecosystem restoration, excluding Indigenous tribes from the leadership level.

Literature Review

Indigenous Stewardship Before European Arrival

Despite popular notions, M. Kat Anderson (2005) argues that the qualifiers "hunter-gather" and "forager" inaccurately categorize the lifestyles of California Indigenous populations. Rather than passive agents existing off fruits and animals that populated the land independent of human interference, Indigenous people cultivated the local flora and fauna to meet their needs, with specifics varying between tribes (Anderson, 2005). Large-scale cultivation was possible through fire use, where wooden shaft drilling and stone percussion tools facilitated efficient fire ignition (Anderson, 2018). Indigenous people could transport fire by creating a slow match or torch with tightly bundled materials, circumventing landscape or weather difficulties. This fire technology facilitated extensive vegetation management over large landscapes more quickly and with less intensive efforts than other tools, like seed beaters, at the time would have allowed,

establishing that Native Americans had the technological capability to alter California landscapes significantly (Anderson, 2018).

Pre-colonization land management systems in California date back 12,000 years, with Indigenous tribes using burning, pruning, selective harvesting, sowing, transplanting, and seed beating to alter vegetation size, abundance, and growth patterns in multiple species (Anderson, 2005). Regardless of their misconceptions, European archeologists' field notes and eyewitness accounts document some Indigenous land management practices and their frequency. For example, archeologists recorded that Indigenous Californians used wildfire to manage flora and fauna, saved wild seeds for sowing, and pruned non-domesticated vegetation (Anderson, 2005). In addition, prescribed burns in the fall and spring cleared landscapes of brush, which opened the landscape for ease of traveling and hunting (Anderson, 2018). Brush removal reduced the risk of large wildfires that threatened loss of life and food insecurity; intentional fires occurred in coastal redwoods, tule marshes, mixed conifer forests, northern hazelnut flats, and southern oak woodlands (Anderson, 2018).

Beyond general brush removal, Indigenous villages used fire for local resource management and specific cultural purposes. For example, Anderson (2018) wrote that fire management increased plant growth for food, medicine, and cultural items. According to the chronicler José Joaquin Moraga, in 1775, the Ohlone burned numerous patches to make pastures for increased deer forage. Bill Franklin, a modern-day Sierra Miwok elder, reported that the Miwoks burned the same areas annually, setting fire to the bottom of a slope to remove debris, decrease snowpacks, and encourage growth in deer hunting grounds. To further facilitate hunting, the Ishi created fire circles around bears, the Sierra Miwok burned tule to find and

remove barriers around beaver house entrances, and the Yuki, Pit River, and Pomo burned grasslands to collect red-legged grasshoppers (Anderson, 2018).

To supply materials for cultural items, different Indigenous tribes burned either trees and shrubs, such as willow, hazelnut, redbud, and California lilac, or perennial grasses, such as deer grass and bear grass (Anderson, 2018). When perturbed, trees and shrubs produced vertical growth of flexible shoots with little branching; Indigenous fire management incited such growth and, with repetition, increased plant regeneration and survival ability. Grass burning maintained clearings with optimal sunlight levels, reduced detritus and competition, and recycled nutrients, which increased flower stock production and individual plant hardiness to manage grass populations. Based on the tribe and town, Indigenous people used shoots and grasses for baskets, weapons, clothing, instruments, tools and utensils, fishing gear, boats, and other cultural goods (Anderson, 2018).

Beyond hunting and cultural material supplies, Indigenous people used intentional fire for vegetative food production—targeting open woodlands, grasslands, meadows, and prairies (Anderson, 2018). For grasses and wildflowers, burns timed with plant growth increased seed production, removed detritus, recycled soil nutrients, and aided harvest efforts. Increased seed production helped maintain a group's seed stock, which Indigenous people would later broadcast on the burned area to ensure new growth. Likewise, with archeological evidence starting 8,000 years ago, Indigenous people managed corm, bulb, and tuber populations with fire, burning specific species of competing plants. Herbage and edible leaves required frequent burning for ideal crop yields, with records of the Southern, Northern, and Central Miwoks, Valley, Wukchumni, and Chukchansi Yokuts, Western and North Fork Mono, and Pomo all using the practice. Prescribed burns increased tree and shrub fruit production of huckleberries,

blackberries, strawberries, western choke cherries, and other plants. Finally, fires prevented crop loss for food production and basket materials by destroying insects and pathogens that could cause plant disease (Anderson, 2018).

How Indigenous Stewardship Altered California Landscapes

The distribution and extent of landscape alteration depended on the location of Indigenous population clusters and variations in climate and naturally occurring plant abundance within the area surrounding a settlement (Crawford et al., 2015; Klimaszewski-Patterson & Mensing, 2020). Using fire to produce plant abundance, Indigenous people created medium-sized areas of monocultures without competing species, as documented by early Europeans (Anderson, 2018). However, at a community level, Indigenous agricultural practices and fire perturbation fostered species diversity by increasing available soil nutrients and encouraging adaptive trait development (Anderson, 2018). Increased fire frequency produced spatial heterogeneity where open space allowed shade-intolerant plant species to grow in mixed coniferous forests that favored a closed canopy structure (Crawford et al., 2015). In various habitats, frequent burns produced land surface area containing large transition zones and a wide range of succession levels that heightened the abundance of niche-edge effects and seed germination (Anderson, 2018).

Changes in habitat composition following a burn reduction substantiate the community diversity under Indigenous stewardship. Without Indigenous management, woodlands and forests overtake previously open meadows, prairies, and grasslands, with coastal prairie habitats and Labrador tea wetlands particularly dependent on prescribed burns for survival (Anderson, 2018). For example, changing climates, fire suppression, and unregulated deer grazing around Humboldt Bay threatened coastal prairie habitats by facilitating the encroachment of trees and

shrubs and degrading the soil, consequently converting the delicate habitat into Northern Coastal Scrub (Guerrant et al., 1998; Stephens et al., 2018).

Following Euro-American fire suppression, tree species that Indigenous people specifically cultivated to dominate woodland and forest ecosystems have since declined in population, including California black oaks, sugar pines, and ponderosa pine in Sierra Nevada forests, Douglas fir and tanoak North Coast Ranges forests, and California black oaks in Western Klamath Mountains mixed conifer forests (Anderson, 2018). For example, in the Sierra Nevada foothills, American logging reduced ponderosa pine to patches; fire suppression inhibited ponderosa pine's ability to reproduce, as fire increases pine regeneration from 25 percent to 93 percent (van Wagendonk et al., 2018). Regarding California black oaks in the Yosemite region of the Sierra Nevada foothills, by 1905, Euro-American management noticeably altered Yosemite National Park, with young conifers and shrubs encroaching on formerly open meadows and woodlands (Bloom & Deur, 2020; Kuhn & Johnson, 2008). Without Miwok annual burns, harvest methods, and other management practices, Yosemite's black oak demographic population consisted primarily of adult oaks with few seedlings and almost no saplings, whereas prior healthy populations primarily consisted of saplings (Bloom & Deur, 2020; Kuhn & Johnson, 2008). Similarly, by decreasing open meadow spaces and canopy gaps and increasing environmental stress from competing conifers, fire suppression predisposed the California coast tanoaks to rapidly spread the novel sudden oak death pathogen, facilitating widespread loss (Bowcutt, 2015).

Northern California lacked the typical pollen signifiers of maize agriculture used to confirm Indigenous landscape management in the eastern United States (Crawford et al., 2015). Instead, ethnographic and anthropological evidence—where researchers contrast recorded local

history of population and technology with predicted climate patterns to determine what fire and vegetation dynamic anomalies resulted from human practices—revealed the existence of different landscape management of Klamath vegetation. In the Klamath regions between Yurok and Karuk settlements, pollen and charcoal records revealed that the shade-intolerant and culturally significant plants *Quercus*, *Poaceae*, and *Pteridium* maintained an abundance contradictory to the period of cooling that favored closed canopy conditions. Corresponding to the start of European-led fire suppression, shade-tolerant plants *Pseudotsuga* and *Abies* increased in population, despite the period of warming that favored open canopy conditions. Therefore, Crawford et al. (2015) concluded that Indigenous prescribed burns altered forest composition to produce shade-intolerant, fire-resilient plants abundance, and European fire suppression altered forest composition to produce shade-tolerant, non-fire-resilient plants abundance. While ethnographic and anthropological research cannot account for the evidence lost to regrowth decay, it provides an approximate reconstruction of forest composition in intentionally altered fire regimes (Klimaszewski-Patterson & Mensing, 2020)

Additionally, documentation of fire rotation and fire return intervals, known Indigenous burn practices, and dendrochronology—the reconstruction of fire patterns and frequency through tree ring and age analysis—allowed estimations of past annual burn rates (Stephens et al., 2007). From there, Stephens et al. found that pre-1800 California, excluding Southern California deserts, approximately burned at an annual rate of 1.8 to 4.8 million ha yearly. Between 1950 and 1999, California burned at an average annual rate of 102,000 ha per year, or approximately 5.6% of the area burned in pre-1800 California. Although lightning strikes were a leading cause of fire ignition, the comparison of Indigenous accounts and dendrochronology reports in coastal California, where lightning strikes were comparatively rare, Indigenous fire management was the

leading cause of fires in pre-1800 coast redwood forests. In other areas of California, anthropogenic ignitions may not have been the primary cause of fires. However, Indigenous fire use was a leading contributor to the annual hectares burned (Stephens et al., 2007). Furthermore, the pre-colonization population of California, approximately 310,000, functions as confirmation of widespread, intentional fire management, as hunting and foraging alone would have been insufficient to produce the food and material quantity needed to support a population of that size (Anderson, 2018).

Spanish and American Colonization and the Start of Indigenous Stewardship Prevention

The initial Spanish presence in modern-day California was limited to temporary stays where European explorers relied on Indigenous expertise, labor, goodwill, and resources to survive California waters and coastal terrain (Akins, 2021). Nevertheless, 16th to 18th century Europeans returned with misconceptions of Indigenous people as childlike and primitive, creating the later justification for Spanish colonization. From 1769 to 1810, Spaniards settled the California coast with missions near existing Indigenous towns, forcibly converting and enslaving Indigenous people. For those initially unaffected by the first wave of Spanish missions, disease spread through Indigenous trade routes, and Spanish livestock consumed crucial food supplies and drove away traditional game. After livestock overgrazed an area, Spaniards replaced native plants with European plants, further exasperating the issue of declining harvests (Akins, 2021). On an ecological level, European grass, with early cures and fast recovery, outcompeted native grass, creating fire seasons with early spring starts and shorter returns between increasingly large fires (Stephens & Sugihara, 2018).

After 1810, according to Damon B. Akins (2021), Spanish colonization moved inland with attempts to capture or recapture Indigenous people. By 1821, the Empire of Mexico

replaced Spanish control and reduced mission support, making them more susceptible to growing Indigenous resistance and igniting the debate over legal solutions for Indigenous land ownership and emancipation. With the 1846 start of American control, courts frequently denied Indigenous people the right to sell or transfer land because of infantilizing myths of Indigenous people as inherently primitive. Consequently, American rule dictated that California land was public domain and free for non-Indigenous settlement (Akins, 2021).

At the advent of the Gold Rush and early statehood, Americans created legal parameters to carry out ethnic cleansing and genocide against Indigenous people. In 1850, as Akins (2021) described, the California governor created state and federally funded citizen militias to hunt Indigenous people, killing approximately 9,000 to 16,000 people by 1873. In 1849, the California government denied Indigenous people voting rights and legal recourse. The 1850 Act for the Government and Protection of Indians allowed indentured servitude of Indigenous children with parental consent and the enslavement of Indigenous people indebted to the courts, allowing Americans to enslave 10,000 to 20,000 Indigenous people between 1850 and 1863. Although Indigenous people used political, linguistic, and geographical knowledge to negotiate for 7.5 million acres of total reservation lands, the federal government decreased the number to 4 reservations. In just over a decade of statehood, the population of Indigenous people declined by 80 percent, going from 150,000 to 30,000 between 1848 to 1860. Approximately one century of Spanish and American genocide removed Indigenous people from their ancestral lands; it denied them fundamental rights, leaving California ecosystems free for Euro-American settlement according to their methods and ideologies (Akins, 2021).

The American Wilderness Myth and Disregard of Indigenous Ecological Influence

Through the influx of Americans into California, ideas of wilderness held by Americans on the eastern side of the modern-day United States became the dominating land ethic. Following the war of 1812, Mark David Spence (1999) argues that pejorative European views on the American landscape and its perceived lack of ancient historical markers or refinery pushed American nationalism to embrace the United States' unique excess of wilderness as a source of pride. In the 1820s and 1830s, many of the first American writers and artists to receive widespread acclaim celebrated the wild American landscape in their work, cementing the pristine, natural wilderness aesthetic as a central feature of American culture and art. In response to the era's political tension, the concept of the wild progressed beyond a point of pride or inspiration to represent an idyllic escape from the realities of a dissatisfying society (Spence, 1999).

American wilderness conservation sentiments grew, Spence (1999) argues, as the commercialization of Niagara Falls marred the pristine scenery and injured American pride. Consequently, national attention turned to the Wild West, with its sprawling mountain ranges and towering forests. National pride for the romanticized veneer of an untouched wilderness culminated in the creation of national parks, starting with Yellowstone National Park in 1872. Before park creation, the 1851-1869 treaties removed all Indigenous people, except the Tukudeka, from parkland to reservations. By the late 1870s, park officials began to fear that the continued presence of Indigenous people would impede park tourism and attempted to use military force to end all Indigenous use of Yellowstone (Spence, 1999). The government's physical removal of Indigenous tribes with active and ancestral ties to the land permitted park officials to wholly deny the existence of Indigenous influences, allowing the American myth of

pristine wilderness to prevail as the cultural, legal, and academic justification for prohibiting Indigenous stewardship (Spence, 1999; Lake et al., 2018).

California Fire Policy: The Gold Rush to Present Day

During early statehood, California policy limited prescribed burns by restricting Indigenous people's freedom to engage in cultural practices and reducing their population with disease and genocide (Stephens & Sugihara, 2018). However, Euro-American settlers legally used fire to facilitate mining and provide forage for European livestock (Stephens & Sugihara, 2018). In the 1880s and 1890s, American foresters modeled Indigenous practices with "light burning," primarily used to limit wildfire damage through fuel reduction (Stephens & Sugihara, 2018). Harold Biswell (1989) noted that the United States Forest Service, in 1905, created an official fire exclusion policy, which initiated a slow move to ban prescribed burns formally. However, the California Department of Forestry (CDF) did not adopt the policy until 1924 due to years of controversy and debate. There were two schools of thought on light burning. Advocates of light burning argued in favor of light burning's utility to clear fuel in the spring and fall, as they feared wildfires would reach inextinguishable sizes. Critics of light burning argued that natural decomposition processes sufficed at fuel reduction enough to prevent wildfires from reaching a size that would complicate extinguishment (Biswell, 1989). A prevailing ecology theory in the early 20th century supported light burning critics, in which ecologist Frederic Clements theorized that fire perturbation halted a community's succession process, preventing the natural creation of a climatic climax (Bowcutt, 2015).

Following the 1905 federal policy, Biswell (1989) argued that political tension grew between the two groups. In 1919, J. A. Kitts of Grass Valley published two articles on the efficiency of light burning as a forest fire prevention method, which garnered public favor. In

response, the Society of American Foresters created the California Forestry Committee to restore faith in the US Forest Service policy. By October 1920, the committee concluded light burning was an unconditionally destructive practice. However, member B. A. McAllister's opposition halted an official committee report until light burn trials occurred. In 1923, the CA Forestry Committee stated that the light burn trials failed to prove the method was more economical or practical than the existing fire exclusion policy. By 1924, the California Department of Forestry accepted the committee's conclusions, adopting the US Forest Service policy. Consequentially, the CDF endorsed the anti-light burning stance that light burns significantly harmed trees, forest debris decay prevented harmful accumulation, and debris accumulation allowed critical thick tree density (Biswell, 1989).

However, by 1945, brush accumulation, the failure of livestock to meet a sufficient grazing capacity, and increased arson rates pushed the California government to authorize the California Department of Forestry to create and distribute landowner burn permits (Biswell, 1989). The introduction of burn permits produced new interest in controlled burns for brush control, proper grazing, reseeding, and fertilization. This interest peaked in 1955 with a total burn area greater than 200,000 acres. However, after the 1955 peak, the yearly total of acres burned declined due to successfully regulated brushland and growing housing density that heightened the risk of fire damage. Additionally, the CDF placed escaped fire liability solely on the private owner; reportedly, forestry personnel offered ranchers excessive reminders of the financial risk, which may have negatively impacted burn rates (Biswell, 1989). Similarly, burn permits required weather approval from the CDF and permission from the local or district air quality board (Miller, 2020). While such considerations are relevant to prescribed burns, ranchers accused the CDF of disrespecting local knowledge and under-approving permits

(Miller, 2020). Regardless, controlled burns under the 1945 CDF permit program functionally ended in the mid-1970s (Biswell, 1989).

Despite the period of burn permits for private ranchers, the 1924 California Department of Forestry policy adaptation established a fire suppression status quo. Beginning with the 1923 Berkeley fire, Stephens & Sugihara (2018) argue that the California general public perceived wildfires as a deadly threat encroaching on urban life. National policy emboldened this perception with the 1935 policy of suppressing fires by 10 A.M. the following morning and the 1942 Smokey the Bear education campaign that presented fire as a danger the public needed to avoid at all costs. Shortly after, the national government streamlined fire suppression efficiency by introducing World War II firefighting inventions to the home front, cementing fire suppression and fighting as the American standard (Stephens & Sugihara, 2018).

However, unlike Indigenous people, national parks were an exception to the fire suppression rule. Following reports of fire suppression policies harming Yellowstone habitats and A. Starker Leopold's "The Leopold Report," the National Park Service created provisions for prescribed burns in 1968 (Stephens & Sugihara, 2018; Bowcutt, 2015). However, they failed to acknowledge the role of Indigenous management in producing healthy ecosystems before the national park system creation (Bowcutt, 2015). That same year, Sequoia-Kings Canyon National Park allowed lightning-ignited fires to burn freely (Stephens & Sugihara, 2018). In 1970 and 1972, Yosemite National Park and the California State Park system adopted the policy of federal and state-led prescribed burns (Stephens & Sugihara, 2018). The National Park Service altered the policy in 1978 and 1988 to refine what they deemed appropriate prescribed burn conditions and encourage the creation of fire management plans (Stephens & Sugihara, 2018).

The success of prescribed burns in California state and national parks failed to reverse the damage of approximately 2.5 centuries of Spanish and American control (Kelly et al., 2019). American management produced ecosystems declining in biodiversity with fewer fire-resilient species and compositions (Kelly et al., 2019). Under dry climate change conditions, fire suppression policies allowed fuel to amass continually, feeding increasingly severe wildfires that, without the precision or intentionality of Indigenous management practices, no longer resemble the fire regime once characteristic of California forests (Anderson, 2018; Hessberg et al., 2021). To restore Northern California's ecosystems, fire policy must prioritize active wildland fire regimes, employ fire treatments and managed wildfires to protect old trees and forests, promote native biodiversity, and restore tree clump and gap patterns (Hessburg et al., 2021).

To implement a fire policy that prioritizes prescribed burning, the California state government may use one of the following partnership models: government, collaborative, and community (Lake et al., 2018). However, Lake et al. (2018) argue that restoration efforts must decentralize government control and include Indigenous tribes and organizations in leadership positions to avoid appropriation and further exploitation. In decentralized partnership models for landscape restoration, the state government can either retain partial authority through the decision-making power shared between multiple partners (collaborative model) or relinquish all authority to community members (community model). When partnership models retain a hierarchical structure (government model), restoration efforts produce fewer benefits at the local level. Community partnership models allow restoration efforts that respond to local resource needs; however, collaborative models permit larger-scale projects that can address an entire region's ecological needs. Therefore, a restoration model where Indigenous communities and

government agencies are equal stakeholders could reintroduce intentional fire to large forest and woodland regions and permit Indigenous stewardship (Lake et al., 2018).

Despite long-standing legal barriers, Indigenous people opposed persisting Euro-American fire suppression support with the 1994 creation of the California Indian Forest and Fire Management Council and continual efforts to reclaim sovereignty (Bowcutt, 2015). Likewise, the dominance of fire suppression wains as the general public calls for change in response to record-breaking fires that cause loss of life, growing firefighting costs, and property damage (Kelly et al., 2019). In response, California fire policy began shifting from suppression efforts to Indigenous-created management models, using Indigenous people's insight into the dynamics of ecosystems and species relationships prior to colonialism-caused degradation, holistic approach, and consistent restoration efforts (Long et al., 2020). The slow shift in fire policy culminated in 2022 with “California's Strategic Plan for Expanding the Use of Beneficial Fire,” which attempts to undo historic restrictions to partner with Indigenous people in restoring California ecosystems with the widespread use of prescribed burns (Task Force, 2022).

Methodology

The previous literature review synthesizes different studies and research to emphasize studies that examine the ecology of Northern California forests, the interaction between California forests and fire, and traditional Indigenous fire and forest management practices. This synthesis constructs a basis to understand Indigenous peoples' role in environmental management and the context of the California fire policy. The current policy, “California's Strategic Plan for Expanding the Use of Beneficial Fire,” will be evaluated for effectiveness and comprehensiveness in building a complex system and workforce for widespread beneficial fire implementation. Based on the literature review's findings, this evaluation will primarily follow

the Wildfire and Forest Resilience Task Force’s attempts to include Indigenous beneficial fire practitioners, reform exclusionary policies, and transition government agencies from enforcing fire suppression into implementing intentional fire in the “Strategic Plan.”

Policy comparison between “California's Strategic Plan for Expanding the Use of Beneficial Fire” and “Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions” facilitates an informed evaluation of the policy as a response to California's sociopolitical climate as revealed by the literature review. “Good Fire” is a report written by the attorneys Sara A. Clark and Andrew Miller and California State University, Chico professor Dr. Don Hankins for the Northern California Karuk tribe and funded through the North Coast Resource Partnership (Clark et al., 2022). Because “Good Fire” was originally published in February 2021 and updated in June 2022, prior to the “Strategic Plan”, Clark et al. critique pre-Strategic Plan fire policy and recommend comprehensive, categorical legal changes to permit cultural and prescribed burning from an Indigenous perspective. As a result, the degree to which the “Strategic Plan” acknowledges existing legal barriers and adapts the necessary changes, according to Clark et al.'s assessment, will determine the adequacy of the proposed plan in addressing the government's long-standing unscrupulous treatment of Indigenous people and transitioning from fire suppression to wide-spread prescribed burns.

Results

In 2022, the Wildfire and Forest Resilience Task Force (Task Force) released “California's Strategic Plan for Expanding the Use of Beneficial Fire” as a supplement to the more general “California’s Wildfire and Forest Resilience Action Plan” (Task Force, 2022). Although the “Strategic Plan” is a supplemental policy, the Task Force presents the “Strategic

Plan” as a policy expansion to detail how the state government aims to improve forest health through extensive prescribed burn utilization. In the “Strategic Plan,” the Task Force proposes key actions and protocol reforms to actualize nine goals necessary to expand beneficial fire. Four of the nine goals respond to the sociopolitical context revealed through the literature review's examination of the relationship between Indigenous people and Northern California landscapes before and through colonization. These goals—one, two, three, and seven, respectively—include the following, develop a robust beneficial fire workforce, empower the private sector, expand cultural burning and tribal engagement, and facilitate larger and strategically located burns (Task Force, 2022).

Goal 1: Develop a Robust Beneficial Fire Workforce

The first “Strategic Plan” goal responds to tension between organizations during burn windows, where agencies compete for resources. The “Strategic Plan” stipulates that the US Forest Service and CAL FIRE must increase cooperation on specific burns to share resources according to the Cooperative Fire Management Agreement and the wildfire mutual aid system with efforts to include the private sector (Task Force, 2022). The “Strategic Plan” attempts to resolve competition further by increasing personnel. Consequently, federal, state, tribal, and local agencies must include people with “burn planning, burn implementation, public communication, air quality modeling and permitting, data analysis and modeling, and operational support” training (Task Force, 2022, p. 20). To provide prescribed fire training, the Task Force instructs the US forest service, California Air Resources Board, CAL FIRE, local and tribal governments, and nongovernmental partners to “secure” funding to create a Prescribed Fire Training Center with satellite sites and partial online delivery (p. 22). Additionally, the “Strategic Plan” instructs governmental agencies to pair hiring practices with actions that decrease pay disparity, solve

housing issues, and improve diversity within the workforce to strengthen retention rates within the expanded workforce.

The “Good Fire” report warns that the California state government displays patterns of shifting responsibility between agencies, misunderstands the complexities of tribal legal status, and lacks cultural competency. Government cooperation and expansion efforts may stagnate if agencies avoid evident ownership of responsibility by neglecting cultural and tribal affairs training requirements for government personnel (Clark et al., 2022). For example, Clark et al. caution that untrained government agents will not know how to accommodate the varying backgrounds—including federally recognized Tribes, California Native American Tribes, non-recognized Tribes, organizations, or operations without official tribal membership—of cultural fire practitioners. Accommodation failures can develop into government parameters that restrict resource and program access to cultural burn practitioners according to standards promoting ease of operation for government agencies over cooperation and Indigenous practitioners' interests (Clark et al., 2022).

To facilitate cooperation and prescribed burn workforce expansion, Clark et al. (2022) suggest that government agencies require at least one personnel member per region with a comprehensive understanding of Indigenous cultural experiences, differing legal status, and cultural burns and can assist cultural burn practitioners. Ideally, the agencies would employ someone Indigenous in this position (Clark et al., 2022). Passed before the “Strategic Plan,” the California AB 642 (2021) requires the Director of Forestry and Fire Protection to hire a cultural burning liaison to advise both the State Board of Fire Services and the Department of Forestry and Fire Protection, leaving the “Strategic Plan” the option to extend this requirement to other agencies. In the “Strategic Plan,” the Task Force (2022) proposes increased inclusion of Tribal

governments and organizations within the beneficial fire workforce and cultural training in education programs; however, the goal does not create standards for tribal legal complexity comprehension or liaison employment requirements.

Additionally, Clark et al. (2022) assert that Indigenous tribes and organizations should have access to government funding to employ personnel to aid in following government agency requirements. Under this goal, the “Strategic Plan” overlooks state funding to facilitate Tribal government personnel training (Task Force, 2022). However, it explains that CAL FIRE and California state parks previously used government funding to hire more staff with prescribed burn training and create a grant program for cultural burns in a later section. This earlier action arguably fills Clark et al.'s requirements but definitively neglects to offer Tribes funds for employees trained in navigating government agency laws and regulations.

Goal 2: Empower the Private Sector

In the second “Strategic Plan” goal, the Task Force (2022) proposes insurance and liability changes to encourage individual practitioner and landowner involvement in prescribed burns, expanding the scale of the beneficial fire. The “Strategic Plan” notes recent programs from CAL FIRE and Natural Resources Conservation Service that, respectively, supply crews to take on projects for landowners and aid landowners in planning and implementing burns. Additionally, the “Strategic Plan” references the passing of SB 332 as a significant change in the legally prescribed burn liability standard for private burners, shifting from a simple negligence to a gross negligence model. SB 332 reduces the financial risk for private burners in incidences where circumstances require CAL FIRE to suppress prescribed fires implemented by private sector practitioners, which the “Strategic Plan” uses as the basis for additional proposed liability initiatives (Task Force, 2022).

For the private sector, Clark et al. (2022) identify insufficient resources as a defining issue for private burners within the legal framework at the time of publishing. For example, the financial cost of a prescribed burn in a treated forest—factoring in equipment, training, hiring trained personnel, acquiring permits, creating burn and smoke plans, and the environmental review process—ranges from \$100 to \$1000 per acre (Clark et al., 2022). According to the “Strategic Plan,” previous CAL FIRE and Natural Resources Conservation Service programs reduced the private burner's need to supply their equipment, crew, and plans (Task Force, 2022). Likewise, the Task Force (2022) encourages regional resource sharing between government and non-government agencies to facilitate burns on privately owned lands under complex jurisdictions. However, resource sharing treats the symptoms of exclusionary beneficial fire systems rather than directing action at the system itself. Furthermore, the “Strategic Plan” reiterates earlier promises to expand training, requiring the DOC to invest \$3 million in developing and supporting Prescribed Burn Associations, with supplemental support from state university Burn Boss programs that offer technical assistance to private burners (Task Force, 2022). Expanded education programs increase private sector access to training and Burn Boss permits; however, the long-term benefits of more accessible education do not solve immediate expenses that prevent private sector participation in beneficial fire use, as Clark et al. argue.

Additionally, Clark et al. (2022) criticize liability policies for creating an exclusionary system that is time-consuming and expensive to navigate as a private burner. However, as noted in the “Strategic Plan,” California SB 332 implemented a gross negligence model for prescribed burns, which follows the first change Clark et al. recommend lowering the legal barriers for private burners (Task Force, 2022). Together, the previous action established a starting point, addressing some of the criticisms in “Good Fire” while leaving room for further proposals in the

“Strategic Plan.” Beyond implementing a gross negligence model, Clark et al. (2022) argue that additional measures are necessary to achieve significant reinvestment in the insurance market for prescribed fire, suggesting a statute that grants intentional fire practitioners complete immunity with exceptions. The Task Force (2022) suggests the California Legislature will remain amenable to additional prescribed fire liability law alterations based on the Prescribed Fire Work Group's review. However, the “Strategic Plan” needs to advance the gross negligence model to meet the additional suggestions from Clark et al.

Furthermore, Clark et al. (2022) argue that insurance for potential fire damage is financially inaccessible and generally unavailable to the private sector. To resolve availability issues, Clark et al. advise the state government to create a state-funded insurance or claim pool for fees, damages, and extraordinary claims to lower the entry barrier and cultivate relationships with landowners. Accordingly, with a starting fund of \$20 million, the “Strategic Plan” creates the Prescribed Fire Liability Pilot Program, which grants non-government burners access to state funds for financial losses associated with intentional burns (Task Force, 2022). Mirroring Clark et al.'s argument that insurance inaccessibility harms current burners and discourages prospective burners, the Task Force (2022) expects the Prescribed Fire Liability Pilot Program to strengthen prescribed burn retention rates in the private sector. However, the pilot program lacks explicit provisions for covering damages owed to those harmed by escaped fires deemed gross negligence, which Clark et al. support as further protection for the fire practitioners.

Goal 3: Expand Cultural Burning and Tribal Engagement

In the third “Strategic Plan” goal, the Task Force (2022) acknowledges the history of Spanish and American prohibition of Indigenous cultural burning and recognizes their continued efforts to maintain these cultural practices. For further context, the “Strategic Plan” explains the

existing work to increase tribal sovereignty in cultural burns. In addition, the “Strategic Plan” emphasizes continued activism and cultural burn revitalization efforts from intertribal organizations and councils, citing the Western Klamath Restoration Partnership's collaborative work with the US Forest Service. Similarly, the “Strategic Plan” highlights the previous state authorization of government agencies to co-manage projects on federally owned ancestral land with federally recognized tribes and the state administrative policy encouraging agencies to extend the same co-management opportunities for state-owned land. Finally, it recognizes the 2021 passing of AB 642 (Task Force, 2022).

To open the key actions, the Task Force (2022) commits to continual government evaluation of regulations and policies related to cultural burning to ensure they do not infringe on tribal sovereignty. Moving beyond merely permitting cultural burning, the “Strategic Plan” proposes measures to include Indigenous people in prescribed burn planning and co-management of the land. Regarding intentional fire planning, the “Strategic Plan” calls for land managers to seek Indigenous expertise on incorporating Traditional Ecological Knowledge into prescribed burns and wildfires managed for resource benefits on ancestral lands. To avoid cultural appropriation, the Task Force encourages land managers to pursue opportunities to facilitate Indigenous leadership and implement cultural burns in conjunction with their prescribed burns. The Task Force uses the goal of co-management to encourage Indigenous leadership at a higher level. The key action promises that land management agencies will supply Indigenous partners with “significant discretion, authority, and resources” to practice cultural burns and stewardship (Task Force, 2022, p. 29). Accordingly, co-managed actions on public land require both the land management agency's and the tribal partner's consent (Task Force, 2022).

Furthermore, the Task Force (2022) supports Indigenous fire workshops by establishing state government recognition of Traditional Ecological Knowledge and cultural fire practitioner's authority to share that knowledge. In the long term, the "Strategic Plan" frames Indigenous fire workshops as a method to endorse Indigenous stewardship to expand the use of cultural burn methods and the number of Indigenous fire practitioners. Additionally, the Task Force outlines more specific actions for the state government under the promise to invest in cultural burning. For example, with Indigenous input, the state government will use available funds and part of the tribal forest health grant budget created by SB 170 to develop a program for cultural burning implementation and actions to increase burn capacity. According to the "Strategic Plan," the state government will consider options to provide inter-tribal organizations with block grants allowing them to administer their own funding programs. However, the "Strategic Plan" stipulates that state government discretion will determine the possibility of implementing block grants (Task Force, 2022).

As previously discussed, government agencies will be ill-equipped to collaborate with Indigenous tribes and organizations without employing Indigenous people as liaisons or having non-Indigenous employees with extensive cultural training (Clark et al., 2022). Likewise, Clark et al. (2022) argue that government agencies lack respect and understanding of tribal sovereignty. While the Task Force (2022) asserts that state agencies will respect tribal sovereignty and facilitate Indigenous co-management, the plan fails to provide specific actions and policy changes to alter the government's historic disrespect and oppression of Indigenous people. From the changes suggested by Clark et al., the "Strategic Plan" notably lacks plans to dismiss permit and training requirements for cultural burns on official tribal land or ancestral territory, upholding the AB 642 (2021) requirement for a supervisory burn boss with final

authority in all intentional fire projects and the SB 926 (2022) requirement of department approval to access Prescribed Fire Liability Pilot Program claim funds. Moreover, the “Strategic Plan” fails to extend the Regional Haze Rule inclusion of cultural burns within baseline smoke emission levels to all air quality regulations, as suggested by Clark et al. (2022).

Likewise, Clark et al. (2022) cite insufficient respect and resources from state agencies as a barrier to cultural burns. The Task Force (2022) responds to this barrier by offering financial support for Indigenous-led prescribed burn implementation and capacity-building actions, allocating an unspecified portion of the total \$20 million tribal forest health budget, which funds tribal projects over the 5 fiscal years between the July 2021 budget implementation and the June 2026 budget expiration (S.B. 170, 2021). According to Clark et al.’s expense range, the entire budget can fully fund prescribed burns for 20,000 to 200,000 acres or an average of 4,000 to 40,000 acres each year it is active, which would fulfill part of or exceed the shared 25,000-acre annual burn goal set for Indigenous and private sector practitioners in the “Strategic Plan.” However, with the fund split between cultural burns and other tribal forest health projects, the grant program may not significantly reduce monetary barriers to cultural burns. Moreover, the grant budget ends in 2026 with no assurance of renewal from the Task Force, creating, at most, a short-term solution. Furthermore, Clark et al. explain that most practitioners participate in stewardship as volunteers, uncompensated for their work even when working in an official capacity as a government agency consultant. By not establishing a long-term grant program for prescribed burn expenses or attempting to compensate Indigenous people for their stewardship work, the “Strategic Plan” reinforces existing systems that Clark et al. describe as “limitations [on] self-governance.”

Additionally, the Task Force falls short of the “Good Fire” report’s minimum standards to respect tribal sovereignty through their proposed support of fire workshops. The “Strategic Plan” neither details the parameters of the government’s support nor stipulates the legal certifications granted upon fire workshop completion. The failure to give fire workshops with state-recognized certification and legal protection—considering the AB 642 burn boss supervision requirement for burns on tribal land—frames Indigenous stewardship’s ongoing learning process and community recognition as insufficient education (Clark et al., 2022). To respect tribal sovereignty, the state government should instead recognize such Indigenous fire workshops as fully independent programs equivalent to the state burn boss programs in legal qualifications and accreditations (Clark et al., 2022).

Goal 7: Facilitate Larger and Strategically Located Burns

In the seventh “Strategic Plan” goal, the Task Force (2022) attempts to incite logistical changes to meet the predicted annual burn acreage targets, which the Task Force seeks to meet through government and nongovernment collaboration. The “Strategic Plan” uses existing efforts as guidelines for further expansion, presenting the CAL FIRE Fresno-Kings Unit, the U.S. Forest Service Sierra National Forest-High Sierra Ranger District, and the Southern California Edison partnerships as successful joint endeavors between government agencies, tribes, and individual landowners to plan and execute expansive burns. The Task Force cites the Regional Fire and Forestry Capacity program through the Department of Commerce as the financial backing for the listed collaborations, implying the program will fund further efforts (Task Force, 2022).

The “Strategic Plan” requires the Fire Memorandum of Understanding (MOU) Partnership—a fire and ecological shared management agreement between government and nongovernment members—to create and execute two to three prescribed burn pilot projects on a

“landscape scale” (Task Force, 2022, p. 39). The “Strategic Plan” suggests more flexible permitting, smoke mitigation procedures, and resource sharing to facilitate these projects, and implores the California Smoke and Air Committee to improve smoke and weather prediction programs to increase prescribed burn windows. Likewise, Clark et al. (2022) highlight specific revisions to air district permitting as crucial to overcoming the most constraining roadblocks. These suggestions include revising the Air Resources Board's California Code of Regulations Title 17 and the Clean Air Act to strengthen objective standards for prescribed and cultural burning with mandatory permit processing timelines, allowing intentional burns with smoke mitigation plans on no-burn days, and permitting air districts to approve burns planned in the next calendar year (Clark et al., 2022).

Instead of fulfilling the key recommendations in “Good Fire,” goal 7 of the “Strategic Plan” mentions the possibility of “more flexible permitting” without specifying the permit type, agency, or modifications easing the process (Task Force, 2022, p. 39). Although, in goal 4 of the “Strategic Plan,” the Task Force does create a deadline for unspecified “policy-level” changes to air quality and pollution permitting and outlines potential reforms that the California Air Resources Board might recommend in the future, which includes some of Clark et al.’s recommendations (Task Force, 2022, p. 32). However, even when supplemented by goal 4, the unambiguous and definite action the “Strategic Plan” requisitions still omits key revisions and neglects measures to enforce suggestions for future reform that, if enacted, would partially fulfill Clark et al.’s permitting criticisms.

The success of goal seven depends on government agencies and the private sector collaboration on logistical planning and prescribed burn implementation. However, the Task Force (2022) fails to address numerous issues within the permitting process, particularly for non-

Fire MOU Partnerships, which the “Strategic Plan” implies are excluded from the relaxed permitting provisions. By neglecting crucial permitting reform, the “Strategic Plan” maintains existing exclusionary policies for the private sector, hindering the government's capacity to execute strategic, large-scale burns (Clark et al., 2022). The Task Force mobilizes the existing Fire MOU Partnership to meet the required landscape-scale projects, which may streamline collaborative efforts by avoiding requests for unspecified government agencies to initiate collaboration, as the Task Force omitted collaboration guidelines and accountability measures. The Task Force’s proposed yearly project goals, expanding burn windows, and resource sharing may facilitate larger prescribed burns for the Fire MOU Partnership. However, the restrictive permit process threatens to impede logistical opportunities for large projects by excluding non-Fire MOU Partnership practitioners from collaborative efforts.

Discussion

“California’s Strategic Plan for Expanding the Use of Beneficial Fire” shifts the dominant fire management ideology, recognizing extensive prescribed fire as a necessity instead of a damaging practice or supplement to widespread fire suppression. Moreover, the “Strategic Plan” progresses fire policy by addressing the state government's long-standing use of fire suppression to justify barriers prohibiting Indigenous people from stewarding their ancestral land. However, the question remains, does the “Strategic Plan” establish comprehensive guidelines for an effective system that adequately resolves sociopolitical impediments to prescribed burns? While the “Strategic Plan” undeniably alters California fire policy, policy comparison between the “Strategic Plan” and “Good Fire” reveals shortcomings and oversights in the “Strategic Plan,” which fails to repeal or rectify significant barriers to prescribed and cultural burns across multiple goals.

The work underway and key actions for developing the fire workforce, empowering the private sector, expanding cultural burning and tribal engagement, and facilitating larger burns acknowledge existing issues and the historical shortcomings in the state government's fire response. As such, the “Strategic Plan” sufficiently identifies vital political and legal areas to reform. For example, the “Strategic Plan” expands prior legislative action to implement a gross negligence model by establishing standards for the Prescribed Fire Liability Pilot Program to minimize the financial burden on burn practitioners in the private sector (Task Force, 2022). Similarly, it creates a clear, exact monetary goal for the Department of Commerce to meet with investors in Prescribed Burn Associations, creating new, accessible education pathways for landowners (Task Force, 2022). In the “Strategic Plan,” similar examples in the four examined goals demonstrate the Task Force’s commitment to expanding beneficial fire by easing entrance barriers.

However, compared to the “Good Fire” report, the “Strategic Plan” acknowledges broad issues without meaningfully proposing legal or policy actions to rectify the identified problems. While the Task Force offers a detailed outline of actions to promote beneficial fire across the “Strategic Plan” goals, the proposed actions may prove ineffective without removing the exclusionary legislature or detailing reform procedures. For example, the “Strategic Plan” excludes cultural burns from regional air district baseline air quality indexes, neglects cultural competency training and cultural liaison agency requirements, and restricts relaxed permit processes to Fire MOU Partnerships members. While progress cannot occur without identifying oversights within fire policies, the Task Force’s overarching failure to outline explicit reform steps undermines the functionality of the “Strategic Plan” as a comprehensive system to promote beneficial fire in California. The state government can evaluate and expand the “Strategic Plan”

during implementation. However, the ambiguous procedures and success metrics establish irresolute standards of accountability to hold government agencies responsible for rectifying years of damaging fire policies.

Additionally, in the “Strategic Plan,” the Task Force fails to establish guidelines for ethical collaboration when agencies concede to co-manage projects with Indigenous organizations and other cultural burn practitioners. Recognition and validation of Indigenous forest management practices are the first steps to respectfully working with Indigenous people; however, without training and education, recognition alone is insufficient (Kirby et al., 2019). Government agencies and climate science organizations should require well-researched training programs that use shared values to foster equal partnerships, emphasizing that individual scientists and agencies must build personal relationships with the Indigenous groups they partner with (Kirby et al., 2019). To further develop partnerships that deconstruct the typical power imbalance, Western government agents and scientists must understand the abundance of observations that build cultural knowledge systems to respectfully engage with traditional Indigenous ecology and resource management practices (Varghese & Crawford, 2020). By reinforcing power hierarchies that undermine tribal sovereignty and failing to establish ethical collaboration guidelines, the “Strategic Plan” expects to circumvent deep-seated colonial beliefs and exclusionary policies without preventative measures. Consequently, the “Strategic Plan” commits to respectful collaboration with and integration of cultural burn practitioners into state-led fire management in word alone.

Therefore, the “Strategic Plan” insufficiently responds to sociopolitical barriers that prevent Indigenous Stewardship by relegating Indigenous organizations to a secondary leadership position at the mercy of government-initiated co-management. Moreover, the

“Strategic Plan” proposes initiatives to include Indigenous people in leadership positions in education programs and collaborative positions. However, the permit and education processes subordinate Traditional Ecological Knowledge and grant superior authority to state programs despite drawing from Indigenous practices within the education model. Without repealing exclusionary policies or establishing proper accountability measures for government agencies, the “Strategic Plan” may incite appropriation by adopting widespread beneficial fire based on Indigenous fire management practices while simultaneously hindering Indigenous leadership and authority.

Conclusion

As an initial proposal, “California’s Strategic Plan for the Expanded Use of Beneficial Fire” demonstrates substantial government efforts to expand the use of beneficial fire in California. Considering the longstanding fire suppression policies, the “Strategic Plan” heralds a new era of fire management for the state government that recognizes past damage and responds to the disastrous wildfire seasons of recent years. Through expanded prescribed burn education programs, grant programs to incentivize private burners and cultural burn practitioners, liability model reform, and requirements for landscape-scale MOU Partnership projects in the “Strategic Plan,” the Wildfire and Forest Resilience Task Force introduce expansive measures and commitments to radically support beneficial fire, a practice that was legally disincentivized. The “Strategic Plan” signifies the California state government's progress toward completely integrating prescribed burns into forest management.

However, the “Strategic Plan” contains ambiguous actions and accountability measures, undermining its ability to guide comprehensive fire policy that transitions from government-enforced fire suppression to a cooperative, government-led system of beneficial fire.

Furthermore, the plan offers few forthright amendments that significantly alter prescribed burn policies to include Indigenous people in leadership positions that honor their expertise and treatment from the state government. Through this comparison of the “Strategic Plan” and “Good Fire” it is apparent that the “Strategic Plan” alone cannot effectively resolve the ecological need for beneficial fire or the sociopolitical barriers to Indigenous stewardship.

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