

WILDFIRE PREVENTION WORKING GROUP

Draft Report
November 1, 2023

Purpose: To identify the causes of wildfires and preventative action that may be taken to reduce the risk of wildfire throughout the State, and prepare recommendations for appropriate legislative action.

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Wildfire Prevention Working Group

The purpose of the Wildfire Prevention Working Group is to identify the causes of wildfires and preventative action that may be taken to reduce the risk of wildfires throughout the State and prepare recommendations for appropriate legislative action.

SUMMARY

Hawaii is facing a growing wildfire crisis. Significant transitions in large-scale land use over the past several decades, combined with the mounting impacts of climate change, have dramatically increased the size and intensity of wildfires across the State. We are at a critical decision point. Bold action is required to address the key drivers of catastrophic fires, significantly increase the pace and scale of land management, and improve the resilience of our most vulnerable communities.

Over the past two months, the Wildfire Prevention Working Group met with stakeholders, received community input, and consulted with subject-matter experts. Given the short amount of time to develop this report, some of the recommendations are preliminary and will need further development and vetting prior to the upcoming legislative session. The process of developing best practices and strategies for wildfire prevention regimes is constantly evolving as wildfire regimes are complex and multi-factored.

FINDINGS

1. Call to Action: Wildfires are a growing threat in Hawaii

- The annual area burned by wildfires in Hawaii has increased 300% between 1904 to 2022.¹
- In the decade following 2006, almost 1,000 wildfires burned an average of 20,000 acres a year statewide, with some years reaching closer to 45,000 acres.²
- Large fires (greater than 1,000 acres) have occurred on all islands and happen multiple times each year across the State.³
- Every year, about 0.50% of Hawaii's total land area burns, which is greater than the proportion of land area burned across the entire United States mainland (0.30%) and

¹ Trauernicht, Clay. "The 2023 Maui Fires and the Context for Improving Wildfire Safety in Hawaii". 6 Oct. 2023, Honolulu. PowerPoint presentation.

² Pickett, E. *Hawaii Has a Devastating Wildfire Problem*, Hawaii Wildfire Management Organization, static1.squarespace.com/static/5254fbc2e4b04bbc53b57821/t/64e534e8701623136866b88f/1692742896702/Fire+Impacts+in+Hawaii++June+2016_MkNotes.pdf. Accessed 26 Oct. 2023.

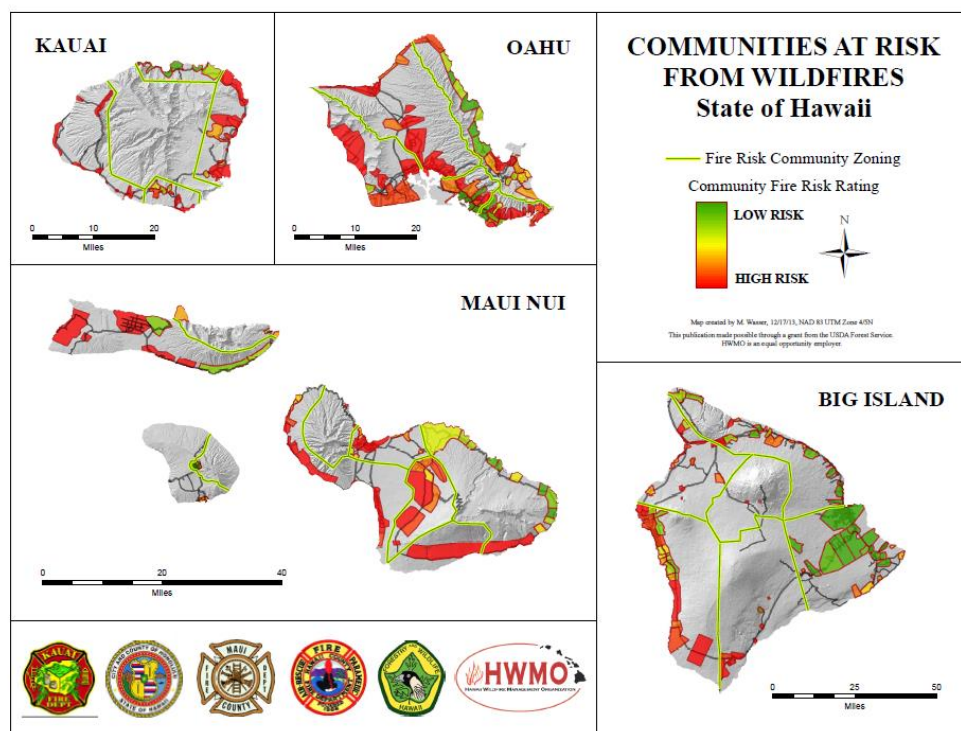
³ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

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even across the 12 states in fire-prone western states (0.46%, including Alaska) over the same period.⁴

- Wildfires destroy native watersheds and change soil, which threaten native species and their forest habitats. As Hawaii is the endangered species capital of the world, many areas that are vulnerable to fire are critical habitats for numerous threatened and endangered species. Loss of habitat can mean extinction for species that are limited to fire-prone areas.⁵
- Heavy rain events after fires cause erosion and loss of topsoil that leaves areas completely bare and unable to support vegetation.⁶
- Post-fire erosion fills streams with sediment, ultimately depositing the sediment in the ocean. This sedimentation smothers coral reefs, creating massive impacts on nearshore water quality, fisheries, and long-term reef ecosystem health.⁷
- Loss of critical watersheds and burned soil from wildfires decrease aquifer recharge, affecting our drinking water sources.⁸



⁴ Trauernicht, Clay, et al. "The contemporary scale and context of wildfire in Hawai'i." *Pacific Science*, vol. 69, no. 4, 2015, pp. 427–444, <https://doi.org/10.2984/69.4.1>.

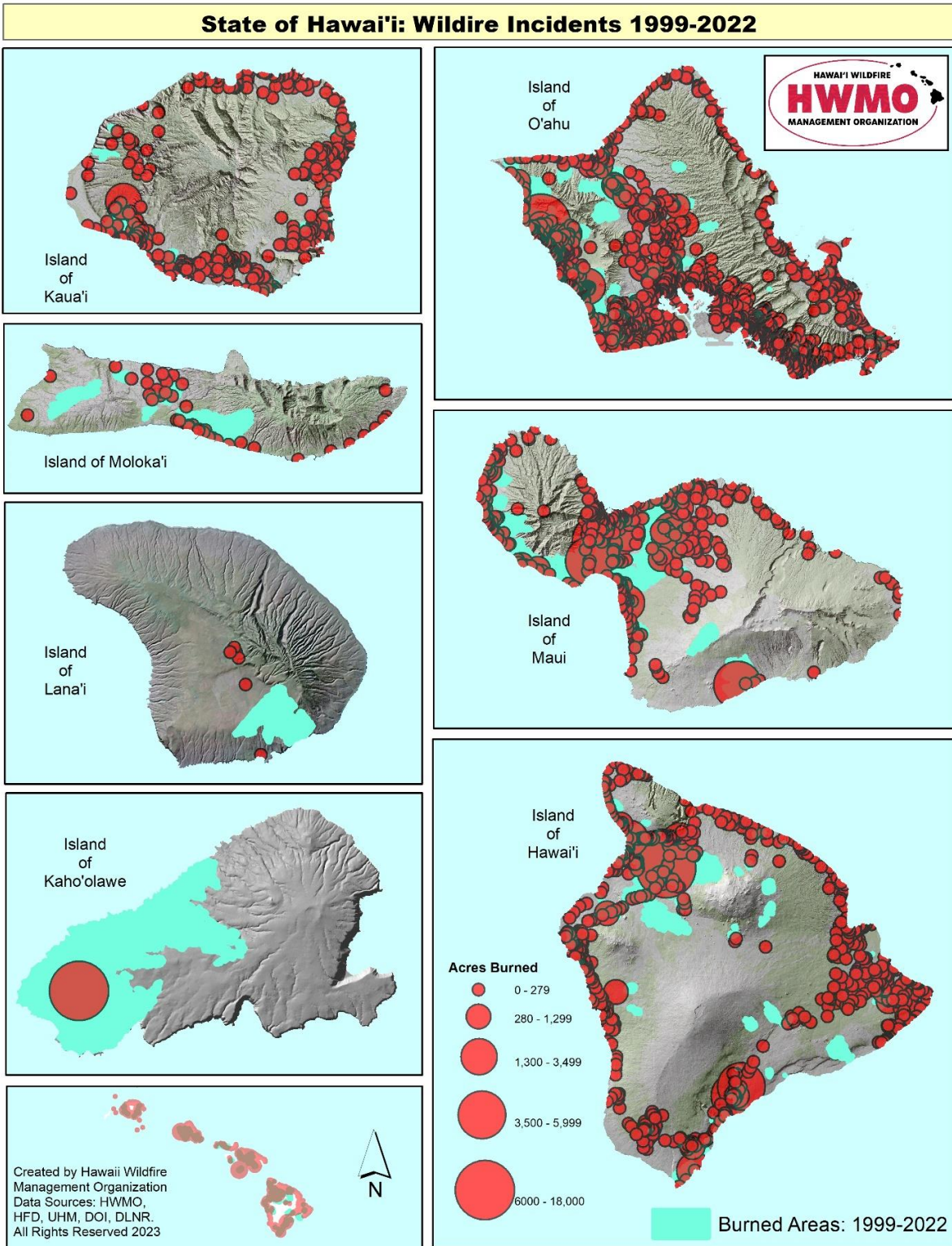
⁵ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

⁶ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

⁷ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

⁸ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

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2. Causes of Wildfires in Hawaii

- People are the primary drivers of wildfires in Hawaii as 99% of wildfires are caused by human ignitions.⁹ Natural causes of ignition are very rare, with lava restricted to active flows on Hawaii Island and lightning strikes accounting for less than 0.2% of attributed wildfire causes.¹⁰
- Accidental ignitions (75%) are a top cause of wildfires including: campfires, equipment, vehicles, downed power lines, and fireworks.¹¹
- 26% (approximately 1,000,000 acres) of Hawaii's total land area has been invaded by non-native, fire-prone grasses and shrubs.¹²
- Guinea grass, fountain grass, molasses grass, and buffelgrass can form continuous fuel beds, ignite easily, attain extremely high fine fuel loads, and are capable of growing back more vigorously in the post-fire environment than the majority of native vegetation.¹³
- The grass-fire cycle perpetuates the problem.¹⁴ Each time fire burns into native forest, it allows the opportunity for non-native species to flourish. This means the fire problem is growing with each new fire.
- Climate is a central determinant of wildfire occurrence and behavior, and climate change has been linked to increases in fire activity.¹⁵ A warming, drying climate, as well as increased frequency and strength of El Nino events have led to drought conditions that greatly increase the wildfire problem.¹⁶ Recent research also suggests a connection between hydrological drought and wildfire susceptibility.¹⁷

⁹ Trauernicht, Clay. "The 2023 Maui Fires and the Context for Improving Wildfire Safety in Hawaii".

¹⁰ Trauernicht, Clay, et al. "The contemporary scale and context of wildfire in Hawai'i."

¹¹ Pacific Fire Exchange, "Overview of Wildfire in Hawaii" PowerPoint Presentation at slide 12, <https://pacificfireexchange.org/resource/slide-presentation-overview-of-wildfire-in-hawaii/>. Accessed 26 Oct. 2023.

¹² Pacific Fire Exchange, "Overview of Wildfire in Hawaii" at slide 12.

¹³ Trauernicht, Clay, et al. "The contemporary scale and context of wildfire in Hawai'i."

¹⁴ Pacific Fire Exchange, "Overview of Wildfire in Hawaii" at slide 13.

¹⁵ Trauernicht, Clay, et al. "The contemporary scale and context of wildfire in Hawai'i."

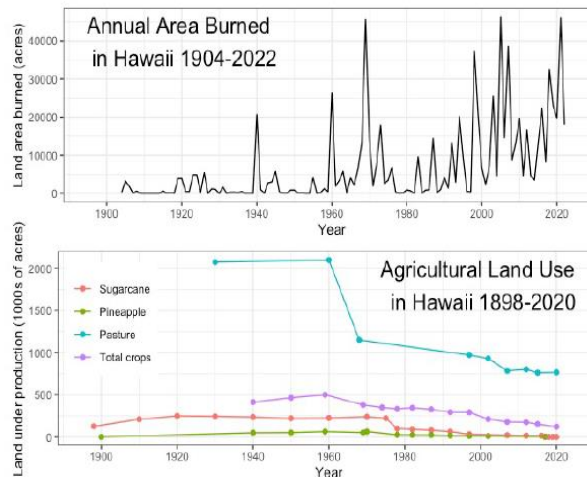
¹⁶ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

¹⁷ Taufik, Muh, et al. "Amplification of wildfire area burnt by hydrological drought in the humid tropics." *Nature Climate Change*, vol. 7, no. 6, 2017, pp. 428–431, <https://doi.org/10.1038/nclimate3280>.

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Fire activity in Hawai'i is directly related to declines in agricultural land use and the expansion of non-native grasslands



Data from University Hawaii at Manoa Wildland Fire Program; Schmidt 1977, USDA Agricultural Census; Perroy Agricultural Baseline of Hawai'i

3. Current Challenges to Wildfire Prevention and Response

- Hawaii spends less than other states on wildfire prevention and response, budgeting an annual average of \$3.2 million over the past decade; about \$2 per resident. In contrast, Washington state budgets, on a per capita basis, more than double the funding than Hawaii does for fighting wildfires, appropriating an average of \$83 million between 2015 and 2019. California set aside \$21 per resident in fiscal year 2022 — \$843 million. Oregon pays about 35 cents more per resident than Hawaii to fight wildfire but has also invested hundreds of millions into an emergency fund.¹⁸
- Declines in active agriculture land use have reduced maintenance and access to roads, water sources, equipment, and assistance, which previously supported firefighting.¹⁹
- Wildfires are a threat to human life as communities have developed on former agricultural land over the last several decades. Many neighborhoods in Hawaii have fire hazard issues, which threaten life, such as a single ingress/egress, pipe and fire suppression systems that are outdated or overburdened, narrow streets, and few firetruck turnaround options.²⁰ The Hawaii Wildfire Management Organization's State

¹⁸ Heaton, Thomas. "Hawaii Has Long Shortchanged Wildfire Protection: 'We Could Have Saved Lives.'" *Honolulu Civil Beat*, 20 Aug. 2023, <https://www.civilbeat.org/2023/08/hawaii-has-long-shortchanged-wildfire-protection-we-could-have-saved-lives/>. Accessed 25 Oct. 2023.

¹⁹ Trauernicht, Clay, et al. "The contemporary scale and context of wildfire in Hawai'i."

²⁰ Pickett, E. *Hawaii Has a Devastating Wildfire Problem*.

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Wildfire Hazard Assessment in 2014 found that two-thirds of Hawaii's communities have only one way in and out.

- Hawaii has not adopted building standards that would better protect structures against wildfires, for example, requiring the use of fire-resistant materials and construction techniques or mandating that space around certain structures are clear of flammable vegetation. Twenty-one states, including California and most other Western states, have adopted specific standards for fire mitigation, according to the International Code Council.²¹
- Most of Hawaii's communities do not yet have well-developed and comprehensive emergency preparedness and disaster response plans. Many of those communities that have Firewise plans have not necessarily integrated those Firewise plans into broader and more holistic emergency preparedness and disaster response plans.
- During the recent Maui fires, the counties were not able to utilize the Intrastate Mutual Aid Act under Chapter 127D, Hawaii Revised Statutes, to share additional firefighting resources.
- Hawaii is the only state without a State Fire Marshal. The responsibilities of a state fire marshal are currently carried out by the State Fire Council. Other states have a State Fire Marshal who is appointed by the Governor and who has enforcement authority.
- Currently, there are some county fire companies within the State operating with staffing levels below the national standard.²²

4. Current Strengths to Wildfire Prevention and Response

- Social Infrastructure: relationships across agencies, engaged communities, educational resources, and community-driven plans (Firewise Communities, Community Wildfire Protection Plans).²³
- Local and indigenous knowledge for fuels management: traditional agriculture practices, grazing, ecosystem restoration, plant propagation, and historic uses of water.²⁴
- Science and technology fundamentals: high-resolution fire history data, current and future fire probability maps, fuels maps, climate data, best practices for post-fire, and fuels mitigation.²⁵

²¹ Flavelle, Christopher. "Fire Exposes Flaws in Hawaii's Defenses Against Climate Shocks." *The New York Times*, 17 Aug. 2023, <https://www.nytimes.com/2023/08/17/climate/hawaii-climate-wildfire-prevention.html>. Accessed 25 Oct. 2023.

²² International Association of Fire Fighters. "Safe Fire Fighter Staffing: Critical Considerations" 2nd ed. <https://www.iaff.org/wp-content/uploads/2019/06/18155-Critical-Considerations-in-Safe-Fire-Fighter-Staffing.pdf>. Accessed 25 Oct. 2023.

²³ Trauernicht, Clay. "The 2023 Maui Fires and the Context for Improving Wildfire Safety in Hawaii".

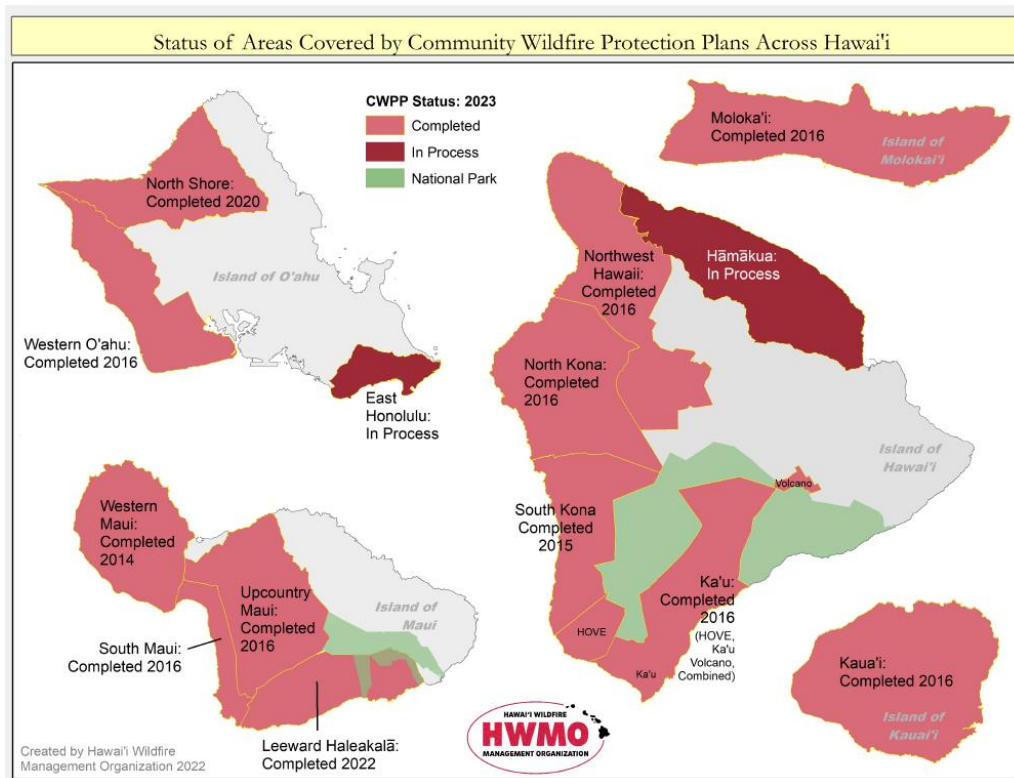
²⁴ Trauernicht, Clay. "The 2023 Maui Fires and the Context for Improving Wildfire Safety in Hawaii".

²⁵ Trauernicht, Clay. "The 2023 Maui Fires and the Context for Improving Wildfire Safety in Hawaii".

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- Hawaii's unique and evolving law regarding water usage, which holds that water remains in the public trust.²⁶



²⁶ Legal issues regarding access and use to water remains contested in Maui County. What is clear are the particular ways water rights are articulated in law, differentiated from other American states. Since 1978, the Hawaii State Constitution has held that water, along with land, air, minerals, and energy sources, are held in trust by the State for the benefit of the people. Article XI, Section I of the Hawaii Constitution states, "For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources, including land, water, air, minerals and energy sources . . ." Further, the Hawaii Supreme Court has held that "[t]he state also bears an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible." In re Water Use Permit Applications. West Publishing Company, vol. 94, p. 97, 2000.

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RECOMMENDATIONS

1. Reducing Ignitions

- Create a public awareness campaign about preventing ignitions, which is key to effective wildfire prevention.
- Increasing criminal penalties for arson in the fourth degree (currently a misdemeanor) during red flag warnings. Enhance the ability of law enforcement to remove arsonists from a community.
- Statewide limitation on consumer fireworks, except by permit for cultural events (See State Fire Council package [H.B. No. 145, Regular Session of 2023](#)) and enforcement of state and county laws related to the trafficking, sale, and use of fireworks.
- Development of best practices regarding downed power lines and electrical power supplies during times of possible ignition.
- Promote strategic undergrounding of utility lines in priority fire hazard risk areas, and all new utility line developments.
- Engagement with counties, community organizations, and encampments to manage lands and reduce the risk of wildfires (See Puuhonua O Waianae and Aina Alliance in Anahola as examples).
- Increase support for practices that increase the infiltration and retention of water in the soil, enhancing groundwater recharge.
- Increase support for native plant nurseries and seed banking initiatives intended to provide inventory for watershed restoration projects and projects that restore ecosystems to natural fire patterns.

2. Reducing Fuel Loads

- Additional resources, incentives, and policies to encourage mitigation actions, especially where land use is changing (for example, developments on former or inactive agricultural land).
- New requirements to promote the creation and maintenance of “defensible space” by both public and private property owners, with legal consequences for violations.
- Preparedness planning, infrastructure improvements, and reducing fuels (burnable plant material) to increase safety and effectiveness of firefighting efforts.
- Incentives for managed grazing as a fuel reduction tool and encourage more managed grazing permits on state lands, where appropriate.
- Include high fuel load and high fire risk as factors considered in determining location of forest restoration projects using state and county funding.
- Active state engagement in cross-boundary land partnerships (for example, watershed partnerships) that share resources to create a larger ecosystem that is conducive to sustainable agriculture and reducing fuel loads in a holistic manner.

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3. Community Engagement

- Encourage Firewise Communities. [The Firewise USA®](#) program helps communities adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.
- Support development of Community Wildfire Protection Plans across the State.
- Modify existing emergency preparedness and disaster mitigation plans to incorporate Community Wildfire Protection Plans where necessary.
- Use reiterative planning process to identify state and county resources needed to effectuate these plans.

4. Protecting Communities

- Develop an inventory of best practices for planning, zoning, development review, and code enforcement to address and reduce wildfire hazards and risks.
- Work with the Public Utilities Commission and Hawaii State Energy Office to develop best practices and laws regarding electrical infrastructure and power lines.
- Update building standards to better protect structures against wildfires.
- Incorporate fire hazard mitigation standards for community planning, design and engineering, such as wildfire-safe subdivision designs, defensible space around homes and communities, adequate emergency access, fire roads, and water infrastructure.
- Work with industry experts, such as the Insurance Institute for Business and Home Safety and National Institute for Standards and Technology, to develop home hardening guidance.
- Create tax or insurance incentives for wildfire-safe structures.
- Disincentivize land banking through increased taxation of lands not being used for public purposes or managed through an appropriate conservation plan.
- Review other states' models for creation of a State Fire Marshal with enforcement authority and investigators.
- Expand the network of Hawaii Emergency Management Agency sirens and upgrade capacity with cameras or other technology as it becomes available.

5. Wildfire Suppression

- Increase response capacity, especially by state personnel.
- Support setting a state staffing standard ensuring all county fire companies maintain staffing levels that, at minimum, meet the national standard.
- Maintain and update wildfire-specific equipment and wildfire-suppression infrastructure statewide (dip tank expansion, reservoir restoration).
- Negotiate standing agreements to use privately-owned water storage sources where available.
- Expand wildland fire training opportunities across all response agencies.
- Review counties' ability to provide intrastate mutual firefighting aid.
- Authorize Hawaii to participate in a State Wildfire Compact to support efficiently moving fire resources interstate.

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6. Post-Fire Response

- Provide resources for post-fire rehabilitation efforts, such as erosion control, long-term forest restoration, planting native species, and suppressing and removing weeds.
- Where appropriate, consider use of hydro-spray short grasses appropriate for grazing as an independent measure or one to be used in conjunction with planting native trees.

7. Wildfire Research

- Water resources assessment to better understand the availability of water resources for fire suppression and prevention/mitigation efforts such as green firebreaks.
- Assessment of seed production/storage, evaluate needs for seed bank and/or nursery to deliver seeds and seedlings to public and private landowners whose properties are affected by wildfires.
- Evaluate use of “green” firebreaks, created through the strategic planting of water-rich, fire-resistant native species that help to halt the spread of wildfires.
- Fire Assessment/Mapping to determine areas of high risk to help prioritize mitigation and prevention efforts.
- Seek a better understanding of the complex impacts of climate change on wildfire regimes, especially the risks of compounding hazards associated with extreme weather events such as hurricanes and drought.
- Analyze the extent to which hydrological drought impacts wildfire susceptibility in Hawaii, to include analysis of the connection between low ground water levels and increased fire activity.