COUNTY OF MAUI

COST OF GOVERNMENT COMMISSION

REPORT ON WILDFIRE PREVENTION AND COST RECOVERY ON MAUI

July 2021
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COUNTY OF MAUI

Report on Wildfire Prevention and Cost Recovery on Maui

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The Commission shall have the power and duty to:
Study and investigate the organizations and methods of operations of all departments, commissions, boards, offices, and other instrumentality of all branches of the county government and determine what changes, if any, may be desirable to accomplish the policy set forth herein.¹

COMMISSIONERS²

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¹ Charter, County of Maui, Section 3-9.3 (2019)
² The Commission is comprised of nine members. There are currently seven members serving on the Commission, with two vacancies in the process of being filled.
I. Introduction

Following Maui’s unprecedented wildfire season in 2019, where more than 20,000 acres were burned and resources seemingly stretched thin, the Cost of Government Commission decided to examine the County’s wildfire prevention and response practices and costs. The Commission was interested in identifying the current and potential future costs associated with firefighting response and prevention for the County, as well as what additional policies or actions might be needed to reduce these costs and losses.¹

To meet these goals, the Commission examined the following for the Island of Maui: (1) wildfire fighting operations budgets; (2) firefighter risk and liability; and (3) future County wildfire fighting costs, including staffing and equipment needs. In addition, the Commission evaluated statutes and regulations that affect firefighting prevention and cost recovery for private and commercial property owners and estimated the impact of any costs to landowners associated with new regulations. An integral part of the investigation involved the analysis of current and recommended changes to Maui land management practices that impact frequency and magnitude of wildfires.

The investigation found that the number of incidents from a combination of wild/brush/forest fires appears to be increasing, and that this increase poses an increased threat to citizens, properties, and sacred sites. It was assumed at the start of the inquiry that an increase in fire events would subsequently increase firefighting cost overruns, response problems, and result in budgetary pressures for additional fire prevention and fire response resources. This assumption was not supported by the research. It was also assumed that new regulations would likely be needed to meet wildfire threats. This assumption was also not supported.

The investigation revealed that current budgets, combined with County and State access to Federal emergency relief funding, are adequate to meet the current fire threat, but are inadequate for an effective fire prevention and mitigation program. Additional policies and statutes that impose punitive fines, financial recovery, or additional preventative actions are not recommended. The Commission finds that punitive measures are not particularly effective, and that existing preventative and enforcement practices of the Maui County Fire Chief can be expanded to achieve needed wildfire prevention and safety measures pursuant to State law.

¹ “Proposed Parameters and Scope of Investigation into the Threat of Wildfires for Maui County, Wildfire Costs, and Responsibility of Private Landowners,” prepared by Commissioners Patrick O’Neil and Paula Heiskell, for consideration at the May 14, 2020 Cost of Government Commission meeting. See Exhibit A.
II. Background

Wild/brush/forest fires present a growing threat to Maui County citizen safety and property. Island communities are particularly vulnerable because populations tend to be clustered and dependent on single highways, often located on the island edge. Any intrusion on road systems impacts transportation of goods and services and interrupts emergency vehicle response and transport. Escape routes and evacuation locations and resources for populations impacted by fire incidents are also impeded by fire incursions.

In October 2019, the 4,600-acre Mā'alahia fire threatened homes, land, and people. In addition, the rapidly spreading fire shut down State Highway 30, which connects essential services, including the hospital, airport, and County government, to residents west of Mā'alahia. In July 2019, the Waikō Road fire burned 9,000 acres and threatened Maui Electric Company’s Mā'alahia Power Plant, which supplies electricity to 80% of the island. The fire also closed the Kahului Airport, closed roads accessing Kīhei and Kahului and caused part of Mā'alahia to be ordered evacuated. The Hāli'i'imaile wildfire in July 2020 burned 4,300 acres while threatening housing in Pā'i'a. It closed the Hāli'i'imaile Road and the Haleakalā Highway, isolating and/or restricting vehicle traffic to Upcountry residents.2

Pacific Fire Exchange reporting reveals that as Hurricane Lane approached Maui Island on August 24, 2020, a fire of unknown origin broke out in the Kaua'ula Valley. This fire area burned approximately 1,835 acres. A second fire that same day in Kā'anapali consumed 294 acres. Coupled with the Maui Fire Department’s (MFD) ongoing hurricane arrival preparation, the fires seriously stressed public safety service responses. Further complicating MFD operations were strong northerly winds that grounded aircraft fire response. The fire location threatened designated hurricane evacuation shelters and required the precautionary relocation of citizens who had previously fled the hurricane threat area. The Kā'anapali fire burned 21 residential structures, 27 vehicles, and an estimated 150 acres of active farmland.3

Importantly, Hawai‘i’s and Maui’s fire problem is more extreme than on the U.S. mainland. A collaborative study issued by University of Hawai‘i wildland fire researcher Clay Trauernicht and other researchers found that Hawai‘i lands burned by wildfires were increasing substantially over time, but at a higher rate than on the

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fire-prone U.S. mainland. The study, which reviewed State of Hawai’i wildfire records to examine historical trends from 1904–2011, and then evaluated contemporary wildfire occurrence from 2005–2011, found that the mean annual area burned by wild/brush/forest fires between 2005 and 2011 accounted for the destruction of 0.48% of Hawai’i’s total land area. By comparison, the proportion of land area burned across the U.S. mainland totaled only 0.30%. Significantly, it was found that the 12 most fire-prone western states sustained a 0.46% loss over the same time period.

In 2019, Honolulu Civil Beat discussed a review of 12,000 scientific studies by University of Hawai’i Professor Camilo Mora, who found “at least 30 different types of impacts of climate change related to fires, hitting health, food, water, infrastructure, security and the economy.” As of June 22, 2021, the U.S. Drought Monitor designated all of Maui Island as either in a “moderate drought” or “severe drought,” and more than two-thirds of the state has been designated as “abnormally dry.” According to Professor Trauernicht, “You’ve got this sort of one-two punch when it comes to wildfire season in Hawaii. . . . It’s not only drought. Coming out of a wet winter we’ve had, you’ve got a lot of vegetation and particularly grasses that have done nothing but grow and grow and grow very fast. But they go from green to yellow to brown pretty quickly and that is making us way more vulnerable to these big, destructive fires.”

Figure 1 below shows the number of acres burned by wild/brush/forest fires reported on Maui Island from 2004-2020.

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5 Id., p. 432.
6 Id.
7 Id.
While the amount of acreage lost from year to year varies, the data demonstrates a disturbing increasing trend shown by the red average line. The two years suffering the greatest acreage loss were 2019 and 2020. Significantly, Figure 1 reveals that while large acreage loss to wildfire does not occur every year, it forecasts that incidents of costly wild/brush/forest fires will increase in frequency and severity. Importantly, as the threat of wild/brush/forest fires increases, so does the risk to property and citizens.

III. Wildfire Causes

Most wild/brush/forest fires are caused by human actions, 75% of which are accidental and therefore preventable. The Hawaii Wildfire Management Association has identified the following as ongoing fire threats to Maui Island:

- Prevalence of combustible materials
- Poor camping site management of fires
- Accidental fires caused by machinery and vehicles
- Abandoned sugar cane fields
- Poorly maintained and overgrown properties
- Grasses and combustible materials along road rights-of-way
- Low hanging, failure, or shorting of aboveground power lines
- Current fire breaks of only 25 feet on property edges
- Intentionally set fires (arson)
- MFD unfamiliarity with properties

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12 See supra n. 3.
IV. Wildfire Costs to Government

The actual cost to government for responding to the threats listed in the previous section is difficult to determine, as incident response costs do not appear to be individually tracked. They are simply folded in along with responses to home, business, and other fire responses and subsequently represented within the annual Fire/Rescue Operations portion of the budget. As a result, it is difficult to ascertain accurate costs of separate wildfire response expenditures.

Figure 2 shows annual Fire/Rescue budgets from Fiscal Year 2011 through 2020.

As can be seen in Figure 2, MFD’s firefighting and rescue operations annual program costs have increased over the last decade from $23,964,008 in Fiscal Year 2011, to $31,907,087 in Fiscal Year 2020 (the last Fiscal Year with full data). Overall, this represents a 33.1% increase for the 10-year period. By comparison, if the fire/rescue

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operations budget increases from FY2011 had simply kept pace with inflation (CPI calculated at 1.7% increase per year), the FY2020 budget would be approximately $28,020,581. Thus, the fire/rescue operations budget reveals an increase of almost $4,000,000 above inflation, to meet increasing firefighting requirements.

Again, it is important to emphasize that this represents an increase for all fire/rescue operations, not just wildfire/brush/forest fire response. Without further detail, it is not possible to determine whether the increase in wild/brush/forest fire responses has had any influence in driving the budget increases. That said, the anticipated increase of wild/brush/forest fire frequency and magnitude will certainly have some impact on operational response expenditures.

Notably, cost impact or pressure on current firefighting budgets is offset by federal grants that can be accessed if fire costs exceed budgetary levels. The availability of federal emergency funding is included in the annual MFD Operational Budget. This option reduces the County’s incentive to decrease firefighting response costs because the additional expense is not borne by the County or State.

A final cost factor considered was injury compensation to firefighters. Contact with MFD revealed no overriding cost factor due to injuries sustained by firefighters because of fire response.

V. Countering the Increasing Threat of Wildfires

The Commission examined whether new policies were needed to reduce fire hazards. One policy option considered was the adoption of more punitive measures — such as the imposition of fines or paying for actual firefighting costs — for individuals found or thought to be responsible for causing wild/brush/forest fires. Another option is mandatory insurance. The Commission concluded that these are not particularly viable options, as explained further below.

A. Civil and Criminal Litigation

Civil and criminal civil litigation options against individuals who cause fires through arson or negligence already exist.

1. Civil Actions — Negligence

The Cornell Law School Legal Institute defines negligence as a failure to behave with the level of care that someone of ordinary prudence would have exercised under the same circumstances. The behavior usually consists of actions or inactions, including when there is some duty to act (e.g., a duty to help victims of one’s previous conduct).17

Primary factors to consider in ascertaining whether the person’s conduct lacks reasonable care are the foreseeable likelihood that the person’s conduct will result in harm, the foreseeable severity of any harm that may ensue, and the burden of precautions to eliminate or reduce the risk of harm. Negligent conduct may consist of either an act, or an omission to act when there is a duty to do so.

Four elements are required to establish a case of negligence:

- the existence of a legal duty that the defendant owed to the plaintiff;
- defendant's breach of that duty;
- plaintiff's sufferance of an injury; and
- proof the defendant's breach caused the injury (typically defined through proximate cause).

Pursuing civil actions is hampered by the difficulty involved in determining negligence and responsibility. Most fires are accidents and cause minimal damage. Seeking reparations is complicated, expensive, and dependent not only on winning the legal action, but also on the defendant’s ability to pay. If reparation actions are taken only against owners with resources, then the effort may be viewed as discriminatory.

2. Criminal Actions — Arson

Arson is a crime under Hawaii law. HRS Sections 708-8251 to -8254 define four “degrees” of arson, depending on the amount of property damage caused or the threat to human life. But in all cases, damage to property alone is a criminal violation if the fire was intentionally set. Arson in the 1st, 2nd, and 3rd degrees are felonies; 4th degree arson is a misdemeanor.

Arson can also be a federal crime. Under 18 U.S.C. § 844(i), it is a federal crime to damage or destroy, “by means of fire or an explosive, any . . . property used in interstate or foreign commerce or in any activity affecting interstate or foreign commerce.”

The above civil and legal requirements place a substantial burden and workload on County fire and legal personnel if damages are to be sought. As explained previously, proving negligence and/or arson is challenging. Even if responsibility can be determined, the reimbursement of firefighting costs requires the responsible party to have the capital resources to make proper reparations, a condition rarely satisfied.
B. Responsible Agencies and Personnel Required to Recoup Costs

There appears to be little history of pursuing existing options to recoup firefighting or property fire hazard removal costs in the County. For example, MFD does not directly charge for correcting land maintenance problems. While MFD conducts or directs cleanup actions, it is the Budget Office that is responsible for recouping cleanup service costs from the property owner.

Moreover, MFD and County personnel have confirmed that clearing potential fire hazards from private properties is uncommon, as is recouping service costs. The reason for the infrequent cleanup and for seldom seeking reparations for the service is not entirely clear, although the lack of personnel to conduct these actions and the difficulty in performing these functions seem to be factors.

C. Mandatory Insurance

Another option would be to require all property owners to acquire some sort of insurance. However, determining a potential cost to property owners for mandatory insurance is difficult. In addition, landowners might oppose such a measure, arguing that an insurance requirement would cause a hardship or is punitive in nature. Mandating how much insurance is to be carried is also a challenge. Wild/brush/forest fires can cause extraordinary damage and the cost of the event is likely to exceed any insurance held by owners, even if responsibility can be legally established. Coupled with increased government enforcement costs and additional economic expense for both land and business owners, additional insurance mandates would be a challenge to impose legislatively and enforce administratively. Essentially, the County government is the insurer for all, but that is a fair way to distribute the costs of wildfires unless a particularly costly fire is caused by the negligence of a large commercial operation. In that case, the County could and probably should seek to recover the cost of the fire from the entity that caused it. We expect this to be a rare situation.

D. Summary

Seeking after-the-fact financial reimbursement to offset wild/brush/forest fires losses is not an optimal strategy, and rarely will be a viable option. Damage and loss have already occurred. Even if the reimbursement offsets governmental firefighting response costs, it is unlikely that a post-fire legal action will satisfy losses to all parties impacted by fires. The desirable approach to reduce the loss and cost from wild/brush/forest fires is to prevent or at least reduce wild/brush/forest fire outbreak and damage.
VI. **Prevention is the Key to Reducing Wild/Brush/Forest Fires — Legal Authority**

Obviously, if fires are prevented, there is no loss. At the same time, it is impossible to eliminate fire outbreaks entirely. A realistic fire-related loss reduction plan cannot rely solely on a fire response plan, but also must include a fire prevention strategy. The first step in devising such a strategy lies in establishing the legal authority to execute the plan.

Hawaii Revised Statutes Chapter 132 (“Fire Protection”) provides the legal pathway to execute a more directed prevention-oriented strategy.\(^{18}\)

**132-6 Duties of county fire chiefs; periodic inspections; orders to remove fire hazards; appeals.** (a) Each county fire chief, in person or by officers or members of the fire chief’s fire department designated by the fire chief for that purpose, shall inspect all buildings, premises, and public thoroughfares, except the interiors of private dwellings and state-owned airport facilities, for the purpose of ascertaining and causing to be corrected any conditions liable to cause fire or any violation of any law, ordinance, rule, or order relating to fire hazard or to the prevention of fires.

**132-7 Duty of owner to remove fire hazard; expense; lien.** If the owner or occupant, to whom the order is directed, fails to comply with the order, or with the order as modified on appeal, and within the time therein fixed, then the county fire chief may cause the buildings, structures, or premises to be repaired, torn down, demolished, materials removed, and all dangerous conditions remedied, as the case may be, at the expense of the owner or occupant, and, if the owner or occupant within thirty days thereafter fails, neglects, or refuses to pay the county fire chief the expense incurred thereby by the fire chief, the county shall have a prior lien for the expense on the real estate on which the buildings or structures were located, or on the premises involved, by the filing of a notice of lien in the bureau of conveyances or in the office of the assistant registrar of the land court, or both, as appropriate.

The above duty scope was reinforced by the Maui County Department of Fire and Safety in its Master Strategic Plan 2016-2020: “The Fire Prevention Bureau carries out requirements as stated in Hawaii Revised Statutes 132. These include fire

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\(^{18}\) Haw. Rev. Stat. § 132-6 (Duties of county fire chiefs; periodic inspections; orders to remove fire hazards; appeals), located at [https://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0132/HRS_0132-0006.htm](https://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0132/HRS_0132-0006.htm), and § 132-7 (Duty of owner to remove fire hazard; expense; lien), located at [https://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0132/HRS_0132-0007.htm](https://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0132/HRS_0132-0007.htm) (accessed on May 4, 2021).
inspections, investigations, permit plan review, and public education. The goal of the Prevention Bureau is to prevent injuries and loss attributed to fire."\(^{19}\)

However, in the Department’s recently released strategic plan for 2021–2025, prevention is given short shrift. There is no stated goal of fire prevention, or any metric to assess success or improvement in prevention. There is much space devoted to preventing injuries and illness in employees, and to preventing equipment failure, but nothing about what can and should be done to prevent fires.\(^{20}\)

According to University of Hawai‘i wildland fire researcher and professor Clay Trauernicht, public education is one of two main methods to mitigate fire risk in Hawai‘i.\(^{21}\) As previously asserted, any plan to reduce wild/brush/forest fires must incorporate both prevention and response. The Department’s new strategic plan fails to address fire prevention as a mission or goal, a significant oversight.

### VII. Fire Prevention Strategies — Recommendations

Organizations such as the Hawaiian Wildfire Management Organization, the Pacific Fire Exchange, and the University of Hawai‘i, as well as the County Department of Fire and Public Safety, have done an excellent job collaborating and identifying needed actions to reduce the threat of wild/brush/forest fires for island populations. In line with longstanding recommendations made by these reputable organizations, the Commission offers its recommendations to reduce wild/brush/forest fires.

The list below delineates previously identified issues and recommended actions the Maui County Fire Chief should pursue to reduce the frequency, magnitude, and threat of wild/brush/forest fires on Maui Island. While the execution of the corrective action items may not fall under the direct authority of the Fire Chief, the identification of the hazard, demand for corrective measures, and monitoring of progress does fall within the Fire Chief’s authority. Hazards should be identified by appropriate fire department authorities and then presented to the appropriate department, businesses, or owners for action.

1. Most wild/brush/forest fires are caused by human action and should be preventable.

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\(^{21}\) The second main method identified by Mr. Trauernicht to mitigate wildfire risk is a reduction of on-ground hazards, such as overgrown nonnative grasses. See Lyte, “Experts Forecast A Destructive Wildfire Season This Year,” supran. 10.
Action: Expand fire prevention education programs, especially for visitors. Have videos available at airports, hotels, and through public service segments on radio and television. Expand farm and property safety presentations for landowners.

2. Reduction of alien plant life that serves as fuel. Grasses serve as tinder and rapidly invade roadside shoulders.
   Action: Implement an aggressive plan to replace these hazardous fuel sources with native plants to reduce combustible fuel while increasing water retention.

3. Abandoned sugarcane field growth needs to be addressed. Sugarcane plants are remarkably resilient and the lack of maintenance, combined with intrusive grasses, provide combustible, rapidly burning fuels. Periods of drought increase combustibility of grasses and sugarcane. The threat of fire breaking out in these fields will likely increase due to increasing temperatures and prolonged drought periods associated with climate change.
   Action: Work with County agriculture personnel and property owners to eliminate fire potential of these properties. Identify the hazardous locations and then collaborate with landowners to redevelop properties with native and more fire-resistant plants.

4. Poor camping site management of fires and accidental fires caused by machinery and vehicles.
   Action: Expand safety education and inspection programs.

5. Poorly maintained and overgrown properties are potential fire hazards. Properties without fire breaks or poorly-maintained fire breaks provide little resistance to the rapid spread of fires, particularly when fanned by prevailing Maui winds.
   Action: Conduct an aggressive and comprehensive property assessment program to identify poorly maintained and fire-prone properties and then direct necessary corrective measures.

6. Grasses and other combustible materials along roads are a fire hazard. Motorists throwing out cigarettes and or cars parked on shoulders with hot car tail pipes provide ignition sources for roadside combustibles that can quickly spread to adjoining fields and housing areas.
**Action:** Conduct routine inspections and identify road shoulders that need maintenance and task the appropriate County department with reducing the hazard. Explore partnership with the State to develop maintenance plan for State-managed roads.

7. Aboveground power lines that fail, short, or are low hanging can cause fire ignition (sparks) that could start a wildfire, particularly in windy or stormy conditions. This condition is exacerbated by overgrown areas in the rights of way beneath the lines.

**Action:** Routinely inspect power transmission lines and rights of way. Task County and the electric utility companies with corrective actions.

8. Current firebreaks are required to be 25 feet on property edges. This distance is not adequate to prevent fire spread during nominal island winds. Firebreaks of only 25 feet are easily jumped by flying flaming debris.

**Action:** Work with appropriate County department to review firebreak width.

9. Arson is another threat. Intentionally set fires are particularly insidious. These fires can be initiated almost anywhere without warning. Some can be set simultaneously at multiple sites complicating response and containment.

**Action:** While preventing arson is exceedingly difficult, a plan to reduce the impact of such events is achievable. County departments should work together to implement a land management design that incorporates fire breaks and section barriers designed to contain and slow down the spread of wild/brush/forest fires.

10. Many properties are unfamiliar to MFD personnel. While MFD has a regular program of surveying lands to assess fire hazards, much acreage is still unmapped. Lack of knowledge impacts the ability of the MFD to rapidly respond and contain the outbreak.

**Action:** Consider training MFD personnel to use the Real Property Assessment Division’s pictometry of every TMK parcel in the County or other comparable database of property maps and photos from the County’s IT system. When a fire breaks out, immediately download the pictograms (aerial photos) of every property involved and use the information to identify buildings, resident locations, access roads, and water sources to enhance response and containment should fire break out. Conduct regular
inspections to ensure that maintenance and preventative measures are being taken.


This report was a product of the Collaborative Action Planning Workshop, in which private companies, nonprofit organizations, landowners, and various fire research organizations identified numerous maintenance actions needed to reduce the spread of wild/brush/forest fires. The recommendations are notable and worth repeating below:

1. Include dip tanks in an integrated wildfire management plan with ongoing maintenance, particularly in remote, fire-prone areas such as Kahikinui.
2. Establish sustained funding source for establishment and maintenance of wildfire infrastructure.
3. Increase roadside maintenance particularly in areas with high fuel loads and ladder fuels such as the pine plantation outside Haleakalā National Park.
4. Create a whole-island, whole-county prevention and vegetation management plan with focus on sources of wildfire (e.g., roadsides, power lines, encampments).
5. Establish and maintain fuel breaks around communities, particularly in patch urban areas and wildland areas such as Kahului/Wailuku areas.
6. Maintain a firebreak access system particularly in remote, fire prone areas such as Kahikinui.
7. Above ground power lines are vulnerable to wildfire and can even provide the ignition (sparks) that could start a wildfire, particularly in windy or stormy conditions. There are long-term solutions for reducing power line-related wildfire hazards such as infrastructure upgrades. More immediate solutions include fuels reduction and firebreaks around power infrastructure in “hotspot” areas whichever the source of ignition.

VIII. Final Thoughts About Cost

The Commission recognizes that the above recommendations will necessitate an increase in personnel, equipment, and cost. However, the threat from island wild/brush/forest fires is forecast to increase. There are some cost-effective options.

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22 Hawaii Wildfire Management Organization, supra n. 13, at pp. 8–9.
For example, much of the maintenance is seasonally related and can be performed by student employment programs and other part-time employees. Nonetheless, it is inevitable that additional personnel likely will need to be added to MFD to track program conduct and progress. While budgetary considerations are important, this is an opportunity to institute long-term steps that will eventually increase safety while helping to restore and preserve Maui Island’s environment. To begin the process, the Commission recommends that a thorough risk assessment of wild/brush/forest hazards be conducted to aid in prioritizing and sequencing the implementation of this report’s recommendations.

IX. Acknowledgements

The Commission expresses its appreciation to the following individuals for their assistance: Professor Clay Trauernicht, University of Hawai‘i; Elizabeth Pickett, Co-Executive Director, Hawaii Wildfire Management Organization; and Battalion Fire Chief Henry “Hanale” Lindo, Jr., County of Maui Department of Fire and Public Safety. Their work and expertise not only contributed substantially to this report, but also to the continuing effort to improve the safety of Maui citizens while safeguarding the island’s environment.

The Commission would like to thank the Victorino Administration, as well as the members of the Maui County Council, who have continued to support and consider the Commission’s work.

The Commission also thanks Deputy Corporation Counsel Keola Whittaker for his guidance, advice, and assistance in ensuring that the Commission is adhering to all legal matters correctly.

The Commission would like to thank Commissioner Patrick O’Neil, whose work was central to this report. He exemplifies public service and care for our County and community.

Finally, the Commission would like to thank the Office of the County Auditor and Shelley Pellegrino, Technical Writer for the Commission, for their professionalism and support.

Respectfully Submitted:

[Signature]

MICHAEL WILLIAMS, CHAIR
2021 – 2022 COMMISSION TERM

[Signature]

DATE 7/16/21
LIST OF EXHIBITS

Exhibit A  “Proposed Parameters and Scope of Investigation into the Threat of Wildfires for Maui County, Wildfire Costs, and Responsibility of Private Landowners,” prepared by COGC Commissioners Patrick O’Neil and Paula Heiskell

Exhibit B  Pacific Fire Exchange, “2018 Wildfires in Hawai‘i Annual Summary”


Exhibit A

“Proposed Parameters and Scope of Investigation into the Threat of Wildfires for Maui County, Wildfire Costs, and Responsibility of Private Landowners,” prepared by COGC Commissioners Patrick O’Neil and Paula Heiskell
PROPOSED PARAMETERS AND SCOPE OF INVESTIGATION INTO THE THREAT OF WILDFIRES FOR MAUI COUNTY, WILDFIRE COSTS, AND RESPONSIBILITY OF PRIVATE LANDOWNERS

Prepared by Patrick O’Neil and Paula Heiskell for consideration at the May 14, 2020 COGC meeting

At its February 12, 2020 meeting, the COGC reaffirmed the need for investigation into the threat of wildfires for Maui County. The COGC requested that investigation scope and parameters be prepared and submitted to the next COGC meeting in March. Commissioners O’Neil and Heiskell propose the following scope of investigation.

Scope: Determine the current and potential future cost to Maui County of wildfires and what measures can be taken to reduce the risk of wildfires.

Parameters:

1. Determine the wildfire threat to Maui County by conducting an historical analysis of wildfire frequency of occurrence and the damage and costs associated with these events.
   a. Determine threat of wildfires to citizen safety, vulnerability of housing, business buildings, economic disruption, threat to Native Hawaiian sacred lands, and threat to road and other transportation systems.
   b. Review costs to county and fire department and state and federal reimbursement for previous wildfire response.
   c. Project future business revenue losses due to wildfires.

2. Analyze current firefighting response capability to see if any changes are needed and cost associated with these changes.
   a. Identify how current wildfire fighting operations are conducted and funded.
   b. Analyze risk and liability to firefighters responding to and fighting wildfires.
   c. Identify how the county is going to meet future wildfire fighting needs.
   d. Review firefighting staffing, equipment needs, and assistance agreements to determine if improvements are needed.
      i. Identify projected expenditures for firefighting and equipment costs

3. Identify best land management practices for wildfire prevention and limiting the spread of wildfires and reducing costs should a fire occur.
   a. Analyze statutes and regulations that specify private and commercial landowner’s responsibility in wildfire prevention and liability for fires occurring on their property.
      i. Identify current land management wildfire regulations and determine if additional statutes or land management policies are needed.
   b. Determine economic costs associated with any potential new statute or regulation to private and commercial landowners and potential for economic disruption of businesses

We expect the investigation and evaluation of these related topics will take until the spring of 2021.
Exhibit B

Pacific Fire Exchange, “2018 Wildfires in Hawai‘i Annual Summary”
2018 Wildfires in Hawai‘i | PFX Annual Summary

Every wildfire incident is part of a larger pattern and is an opportunity to gain experience and insight for wildfire management. Three main factors contribute to wildfire risk:

Vegetation - Wildfires burn plant material. The spread of non-native grasses and expansion of agriculture fallow lands have dramatically increased fire risk in Hawai‘i.

Climate - Wildfire risk changes, in part, with rainfall. Large fires are most frequent during drought, but heavy rain prior to dry spells also increases risk by causing more plant (fuel) growth.

Ignitions - All wildfires are ignited by something or someone. Nearly all fires in Hawai‘i are caused by people and about 75% of these are accidental, and therefore preventable.

Land Cover of Areas Burned by Largest 16 Fires (94% of total)

<table>
<thead>
<tr>
<th>Land Cover Type</th>
<th>Acres Burned</th>
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<tr>
<td>Non-Native Shrubland</td>
<td>3,061</td>
</tr>
<tr>
<td>Non-Native Forest</td>
<td>1,155</td>
</tr>
<tr>
<td>Abandoned Agriculture</td>
<td>2,332</td>
</tr>
<tr>
<td>Developed</td>
<td>948</td>
</tr>
<tr>
<td>Sparse Vegetation</td>
<td>3,828</td>
</tr>
<tr>
<td>Native Shrubland</td>
<td>3,729</td>
</tr>
<tr>
<td>Native Forest</td>
<td>2,440</td>
</tr>
</tbody>
</table>

Although the number of fires ignited in 2018 was lower than average, the total acres burned was nearly double the annual average. In 2018, 16 fires accounted for 96% of the total area burned.

Fires of Note

**Waikoloa** On August 1st a fire ignited (cause undetermined) east of Waikoloa Village on Hawaii Island. The area’s extensive and continuous grassy fuels in combination with strong winds spread the fire quickly, burning 15,337 acres. It was Hawaii’s largest fire on record since 2005, and one of the five largest fires known in state history. The week-long suppression effort included county, state, and federal response agencies. Though no homes were threatened, the incident highlighted West Hawai‘i Island’s vulnerability to wildfire.

**West Oahu Complex** West O‘ahu fires started on August 4th from multiple ignition points (arson suspected) in Waianae and Makaha Valleys and burned 4,444 acres. County, state, and federal agencies engaged in a multi-day suppression effort, which prevented any home loss despite the fires’ close proximity to communities. Unusual fire behavior, with fire burning up and over ridges to adjacent valleys, spread fire from Makaha to Makua Kea‘au Valley and burned 180 acres within the largest tract of native dry forest habitat on O‘ahu.

**Keaouh** On August 5th, a human-caused fire just outside Hawai‘i Volcanoes National Park, crossed the Park boundary, and grew to 3,502 acres over a week. The fire burned 2,154 acres of native forest and 717 acres of native shrubland. The fire came very close to, but did not reach, Kipuka Ki, a high-value restoration and endangered species area within the Park. The 2018 fire covered much of the area previously burned during fires in the 1970s.

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