

# Fire Safety Alert Latest news from Pacific Fire Exchange

Aloha Property Owners in Kohala by the Sea

Please review these information flyers from the pros. Now is the time to do that outside work while we have cooler temperatures.

Increase your defensible space. Remove fire fuel.

LIVE FIREWISE



communicating fire knowledge across the Pacific

# Quick Reference Guide -

# Fuel Breaks for Pacific Island Grasslands & Savannas



Fuels management in the Pacific includes any method of altering vegetation to reduce hazardous wildfire conditions within tropical grasslands and savannas, the most common vegetation type to burn on oceanic islands. Fuels management should always be part of a broader fire preparedness plan. Be sure to consult with fire professionals (i.e., your fire department) to identify water and access issues, hazards and evacuation procedures.

# How do fuels influence fire?

Fuels management focuses on reducing:

- · ignition potential the probability that vegetation will combust and carry fire.
- rate of spread the speed at which fire moves through fuels over the landscape.
- fire intensity the energy released by the fire, commonly measured as fire temperature or flame length.

# Fuel treatment & break design

# **KEY TERMS**

Fuels reduction - reducing hazardous live and dead plants with prescribed burning, mowing, herbiciding, grazing, etc.

Fuel break - a strip with reduced vegetation thereby slowing (but not stopping) the spread of fire.

Fire break - a line (such as a road) where fuels are completely removed to mineral soil.

Vegetated fuel breaks - known as "green strips" containing low-statured, fire-resistant plants like succulents.

Shaded fuel breaks - dense canopy trees planted strategically to limit grassland fuels.



Fuel breaks serve as a line of defense between ignition sources and valued resources by reducing the chances of wildfire ignitions and creating safer, more defensible spaces.

When fuel breaks are implemented as networks over large areas, they can effectively fragment fuels into compartments that slow fire progression and provide multiple opportunities for firefighters to contain fires. However, intense drought and very high wind conditions may limit their effectiveness in extreme conditions.

### WOODY FUELS

Trees & shrubs within 65 feet of the fuel break significantly increase the odds of a breach (from ember or firebrands) and should be removed or compensated for by increasing the fuel break width

# TOPOGRAPHY

Fuel breaks are most effective at ridge tops or at the base of slopes, since fires tend to "jump" breaks mid-slope.

# WIND DIRECTION

Placing fuel breaks perpendicular to the prevailing wind direction will slow the fire's leading edge.

#### IGNITION SOURCES

Most fires on oceanic islands **FUEL BREAK WIDTH** are human-caused. Ignition A rule of thumb is 2-3 x risk is typically highest near

ANCHOR Effective fuel & fire breaks tie natural or landscape features (roads, lava fields, or cliffs).

# RESOURCES

Small-scale fuel breaks protect valued resources like endangered plants & communication towers

wider than the maximum height of the vegetation, in grassland and savannas, a minimum width of 40-60 feet (50-100 feet is ideal)

# Fuel break establishment and maintenance .....

Lack of regular maintenance is the biggest cause of fuel break failure. Proper maintenance includes:

- · mechanical and chemical treatments mowing, plowing, disking or in remote areas weedwhacking followed by herbicides (glyphosate, imazapyr, and/or pre-emergent).
- removal of woody debris remove dead vegetation post-treatment within the fuel break and along the boundary or at a minimum remove lower branches and foliage of remaining trees.
- 2-4 treatments per year or more in wetter areas or during wetter years.

# 

A long-term strategy includes replacing grasses with green breaks or greenstrips (called fuels conversion) that reduces fire risk by disrupting fuel continuity, physically blocking wind, absorbing radiant heat, and halting the fire.

#### SHADED FUEL BREAKS



Although more design research is needed, planting trees can increase the moisture of understory vegetation. The savanna fire in Palau above self-extinguished at the forest edge. Foresters in Yap report planting a mix of native and non-native species 8 feet wide with trees spaced 8 feet apart.

#### RESTORATION



Restoring Hawaiian species like the 'āweoweo shrub (shown above) may exclude flammable grasses like fountain grass. New Zealand fire managers have identified low flammabile Coprosma and Pittosporum species. Non-native, thick-leaved, succulent plants such as aloe, sempervivum, and yuccas are ideal, but only if they are not an invasive threat to native ecosystems.

# Landscape scale treatments - prescribed fire & grazing .

# GRAZING AND PRESCRIBED BURNING

At the landscape level, both grazing and prescribed burning are more costeffective than mechanical or chemical vegetation removal. Ranchers in Hawai'i graze and browse by cows, sheep, or goats to

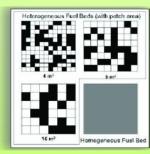


reduce fuel loads and in high risk areas, such as roadsides.

While effective, use of animals may risk overgrazing, erosion and the establishment of unpalatable plants over the long term. Prescribed burning requires specialized training, fire suppression capacity, adequate water and fire breaks and must be implemented with care as native ecosystems in the Pacific are not fire adapted.

#### PATCH MOSAICS

Establishing a mix of different habitat or vegetation patches (including woody species which can regenerate after fire) can disrupt the continuity of grassy fuels across the landscape. This can be done via grazing or fuels conversion and reduced management costs. For example, prescribed burning



under wetter conditions may result in smaller fires thereby avoiding large, destructive fires later on.

#### SELECTED REFERENCES

1. Cheney, P. and Sullivan, A. 2008. Grassfires: fuel, weather and fire behaviour. CSIRO PUBLISHING.
2. Cui, X. et al. 2019. Green firebreaks as a management tool for wildfires: Lessons from China. J. of Env. Mgmt. 233: 329-336.
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# ADDITIONAL PLANNING RESOURCES

1. Trauernicht, C. and E. Pickett. 2016. Pre-fire planning for Hawaii and Pacific Islands. PFX Extension Guide (CTAHR RM-20). www.PacificFireExchange.org

## GO BEYOND THE BASICS

for more information:

Fuel Breaks and Fuels Management Strategies for Pacific Island Grasslands and Savannas at www.PacificFireExchange.org

#### **ACKNOWLEDGEMENTS**

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