

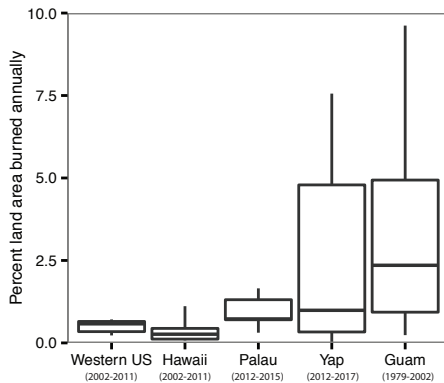
# Wildfire in Paradise - Management Context & Challenges

Many residents and visitors of the US Affiliated Pacific Islands (including Hawaii, Guam, the Northern Marianas, Yap, and Palau) may not understand the reality and scale of the islands' wildfire problems because wildland fire conflicts with a postcard image of paradise. The most densely populated and heavily-visited areas tend to have low fire risk, but represent only a small portion of the islands. Fire managers and fire prevention efforts in the US API address the challenge of bringing the larger island landscapes and year-round resident communities into focus. This document is intended to assist those efforts.

## Fires Affects Entire Watersheds

### Extent of Burned Area

In many years, wildland fire affects a greater percentage of Pacific Island land area than that of the 12 westernmost US states<sup>1</sup>.



Boxplots above show the percent area burned based on available fire histories for US Pacific Islands relative to the 12 westernmost US States. Horizontal bars are median values, boxes show 25th and 75th percentiles, and whiskers show max. and min. values.

### Thinking "Ridge-to-Reef"

Small land areas mean tight linkages between human communities and terrestrial and marine ecosystems. Wildland fires directly impact fire-sensitive forest resources and also impact coastal areas by increasing downstream sediment delivery<sup>2</sup>. The "ridge-to-reef" perspective is essential because all watersheds on Pacific Islands lead directly to coral reefs, which provide critical sources of food, recreation, and tourism.

Compared to other coral reef stressors like sea temperature rise and ocean acidification, fire-driven erosion is highly preventable. Improved fire management is a key strategy for mitigating coral reef declines across the region.



The photo above was taken on the island of Yap. It shows where a wildfire burned through savannah (foreground) and stopped at the forest edge (mid-ground). Sediment runoff from the denuded slopes will reach the forest and fringing coral reef (background). Photo: Clay Trauernicht.

### Vulnerable Native Ecosystems

The native ecosystems on Pacific Islands are home to a number of threatened and endangered species. Unlike many mainland ecosystems, native ecosystems on Pacific Islands are not fire-adapted. In general, these islands' native plants do not recover well, if at all, after fire

## Fuels & Fuel Treatments

### Invasive & Nuisance Species

Grasslands and savannas are the most frequently burned ecosystems in the Pacific Islands and occupy a significant proportion of island land areas.

The widespread distribution of these ecosystems, dominated by nuisance and invasive grasses increases the exposure of forest ecosystems to fire and promotes a grass-fire cycle.

Tree planting can help to shade out fire-prone grasses and shrubs while also restoring the function of watershed forests.



A person hikes through sword grass on Guam. Photo: <https://therokyroad.wordpress.com>

### Weather & Fuels

Warm temperatures year-round and ample annual rainfall results in rapid fuel accumulation and very high fine fuel loads (5-10 tons/acre on Hawaii and Guam, for example<sup>1,2</sup>).

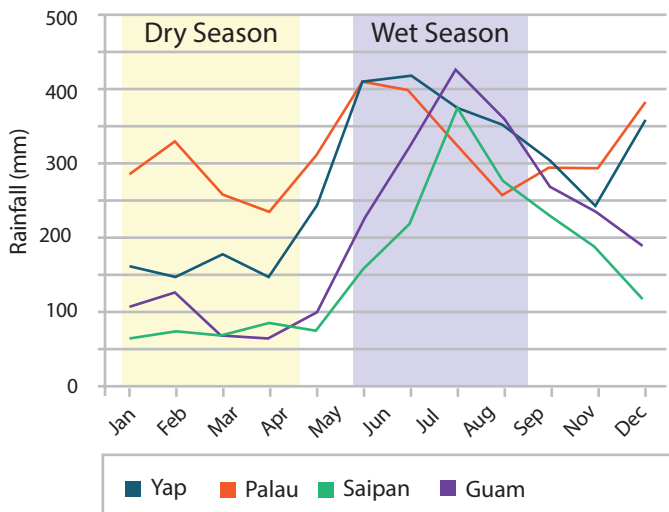
Fuels management can require 3-6 treatments per year for maintenance and is often limited to labor-intensive strategies like weed-eating to avoid erosion caused by heavy equipment use.

The potential for fine fuel types to carry fire is highly sensitive to quick and relatively small fluctuations in relative humidity. Many fire managers in Hawaii consider an RH of 60% or less to be a threshold for high fire potential.



Experimental fire in Hawaii in guinea grass, with flame lengths greater than 20 feet. Photo: Clay Trauernicht.

## Weather & Climate



Rainfall on western Pacific islands shows distinct wet and dry seasons. Thirty-year average rainfall data from Western Regional Climate Center.

Fires can occur any time of year but annual rainfall seasonality and El Niño-driven drought events are the key determinants of fire activity in this region. Hawaii, Guam, Palau, Yap, and the Northern Mariana Islands annually cycle between a wet season that promotes fuel accumulation and a pronounced dry season that allows fuels to cure.

El Niño events greatly exacerbate dry/wet season patterns, often increasing rainfall at the start of the event followed by severe, region-wide drought. During El Niño events in 1982-83 and 1998-1997, twenty five percent (25%) of Pohnpei Island and ten percent (10%) of Guam's land area burned, respectively.

## Ignition Sources



Illegal fireworks light up the sky over Central Maui, Hawaii on New Year's Day 2015.

The Maui News / Photo: Chris Sugidono

Dry lightning ignitions are rare. People cause most fires on Pacific Islands. Existing island practices like juvenile fire starts and at-home fireworks displays are often considered part of island culture and identity, posing the challenge of creating messages and programs that successfully balance social sensitivity with effective fire prevention.

## Additional Information

### Resources

[www.HawaiiWildfire.org](http://www.HawaiiWildfire.org)  
[www.PacificFireExchange.org](http://www.PacificFireExchange.org)

### References:

1. Trauernicht, et al. 2015. The scale and context of wildfire in Hawaii. *Pacific Science* 69:427-447.
2. Minton. 2006. Fire, erosion, and sedimentation in the Asan-Piti watershed and War in the Pacific NHP, Guam. Pacific Cooperative Studies Unit, University of Hawaii at Manoa, Department of Botany. PCSU Technical Report, 150.

## Geography of the US Affiliated Pacific Islands

