



# Wildfire’s Impacts to Rare and Endangered Hawaiian Plants

As wildfire, drought and invasive species increasingly impact native ecosystems, plants and animals, our remaining natural and cultural Hawaiian heritage is more threatened than ever.

Repeated fires put rare, threatened and endangered plants at extreme risk.

## Wildfire & Native Hawaiian Ecosystems Are Incompatible.



Hawaiian ecosystems aren’t evolved to withstand aggressive continental grasses such as African fountain grass and Guinea grass which thrive and spread after fire. To date, 25% of Hawai’i is covered by non-native grasslands and this footprint is increasing.<sup>1</sup>

*Hawaiian dryland ecosystems, considered among the most species-rich and culturally important places in Hawai’i are critically endangered.*

Dryland forests which supported the physical and spiritual sustenance for Hawaiian daily life are especially vulnerable. These places contained medicines, tool and house-building materials, fishing, weaponry and prayer.<sup>2</sup> Repeated fires, low species numbers, drought, and animal browsing add to the crisis.

On O’ahu and Maui, recent fires have impacted some mesic and mesic-wet forest species. However, most of the recent wildfire incidents involve drylands species, such as the Ka’ena subspecies of ‘akoko which has been impacted by 8 fires on O’ahu. Twenty-two of 45 plant species have burned just once while the other half of the species list has been impacted 2–8 times.<sup>3</sup>

## Hawaiian State Flower Ma’o Hau Hele



**Species name & status:** Ma’o Hau Hele (*Hibiscus brackenridgei*), endangered  
**Location:** three subspecies are native to dry forests and shrublands (400 to 2,600 feet elevation) on all the main Hawaiian islands except Ni’ihau and Kaho’olawe.  
**Traditional uses:** dye for kapa cloth  
**Current threats:** habitat loss from invasive weeds, browsing by feral animals (goats), wildfire  
**Vulnerability to fire:** Four fires between 2006 - 2022 have impacted the species. For example, the 2007 Waialua Fire burned through nearly all of the species (*Hibiscus brackenridgei* spp. *mokuleianus*) on the north shore of O’ahu, destroying approximately 90% of the wild individuals left on that island.<sup>4</sup>



# Wildfires especially in drylands ecosystems can be catastrophic.

## Wildfire & Rare Plant Review & Results (1999 - 2021)

The number of wildfires where a fire perimeter overlapped with known rare plants were tallied between 1999–2021. Note that plant numbers prior to and after incidents are best estimates based on available surveys<sup>4</sup>. Federal lands (National Park Service, Dept. of Defense) conduct thorough inventories before and after fires. Incidents which may have impacted rare plants in un-surveyed areas elsewhere are unknown.

- ☀ At least 36 different fires impacted a total of 45 endangered plant species across 5 islands or about 9% of Hawai'i's threatened or endangered species totaling 425 species.
- ☀ O'ahu has the most incidents (15), followed by Maui (10), and Hawai'i Island (9), Moloka'i (3) and Lana'i (1). Kaua'i had zero incidents.

Table 1. Summary of known wildfire incidents impacting the most rare, threatened and endangered plant species between 1999 - 2021 on three Hawaiian Islands

Locations by Island	No. of Fires <sup>5</sup>	Est' # Rare Plant Populations Diminished or Eliminated
Hawai'i Island: Nohonaohae, Pōhakuloa, Pu'u Wa'awa'a	9	35–39
Maui: Olowalu, Ma'alaea	10	12–13
O'ahu: Wai'anae Kai, Mākua, Nanakuli	15	33

**References & Notations:** 1. Trauernicht, C., Pickett, E., Giardina, C.P., Litton, C.M., Cordell, S. and Beavers, A., 2015. The Contemporary Scale and Context of Wildfire in Hawai'i. *Pacific Science*, 69(4), pp.427–444. 2. Medeiros, A. et al. 1998. Auwahi: Ethnobotany of a Hawaiian Dryland Forest, Cooperative National Park Resources Studies Unit, University of Hawai'i at Mānoa. 3, 4. Trauernicht, C. and Department of Land & Natural Resources Division of Forestry & Wildlife, 2022 (unpub data). 5. For a complete list of fires, see <https://pacificfireexchange.org/resource/wildfires-impacts-to-rare-and-endangered-hawaiian-plants> 6. Trauernicht, C. and M. Kunz 2019. [Fuel Breaks and Fuels-Management Strategies for Pacific Island Grasslands and Savannas](#), College of Tropical Agriculture & Human Resources, University of Hawai'i at Mānoa RM-22. 7. 2022 Ecosystem Management Program Bulletin, U.S. Army Garrison Hawai'i.

## 3 Actions For Species Resilience

- 1 Avoid High Risk Activities** especially incendiary & fire-promoting activities in drylands areas during drought.
- 2 Make Landscapes Wildfire Resistant** by installing and maintaining cross-boundary fuel breaks (see the PFX guide<sup>6</sup> [here](#)) around critical habitat & vulnerable plants. Reduce grassy fuels locally & across the landscape by grazing, re-forestation, and/or installing green breaks.
- 3 Invest in Species Extinction Prevention, Monitoring & Mitigation** by monitoring rare species before & after fire, out-planting them in a variety of places, advocating for emergency stabilization and rehabilitation after fire, and seeking to increase capacity for landscape-scale fuels reduction.

### Maintaining Buffers & Refuges for Rare Plants



Pōhakuloa Training Area (PTA) on Hawai'i Island currently maintains weed control buffer zones (above) in which highly flammable fountain grass is reduced by 80% to help limit the vulnerability of threatened and endangered species to wildfire. A total of about 39 miles of 60-foot wide fuel breaks (middle) installed throughout PTA help protect important refuges for species like the endangered *Lipochaeta venosa* (bottom).<sup>7</sup>

