



Drought & Conservation Operations in Hawai'i

Natural Resource Manager Observations & Considerations

Drought not only impacts landscapes, plants, and animals, it also affects people and organizations. Natural resource managers may need to adjust their activities in response to drought and may experience changes in their work environment, funding sources, and their own physical and mental state. Perspectives shared by land stewards across Hawai'i, summarized here, can help managers prepare for and cope with the impacts of drought.

Adjustments in Stewardship Activities

Ignition Prevention & Fire Preparedness

Drought increases wildfire risk, so during dry periods conservation field workers may be restricted in their activities and where they can work. For example, workers may have to:

- Avoid driving in areas of overgrown, fire-prone vegetation
- Limit fence welding in the field
- Restrict or slow the operation of heavy machinery and other tools

To reduce response time in case of a wildfire ignition, staff trained in fire suppression may also carry fire-fighting gear with them as they go about their normal activities.

Weed Control

Active plant growth slows during drought, which can help and also hinder weed control efforts. Dried-out grasses may be easier to cut back, reducing labor time. However, herbicides used to control non-native grasses become ineffective without active plant growth. Workers may instead focus their weed control efforts on invasive trees and shrubs during drought.

“The number of people that work for you is finite. You're going to put them on something that has the most impact. When you're in a period of drought, you really have to think that through.”



Figure 1: Workers building a fence to protect conservation areas from feral ungulates.

Credit: Matt McDonald/ West Hawaii Today.

Water Sources

The streams and water catchments that workers normally rely on for restoration activities, field station maintenance, and fire suppression become depleted during drought, so more labor may be required to:

- Transport water to restoration plantings and rare plants
- Inspect and maintain water infrastructure and fill catchment tanks

Loose Soils & Dust

Some soils become more loose and prone to erosion as they dry out and lose plant cover. This may hamper helicopter operations where landing spots become too dusty for use. In certain areas during drought, more erosion occurs on and around recreational trails, compromising trail safety, and requiring more trail maintenance.

Ecological Monitoring

Monitoring ecological impacts of drought is important for improved land stewardship (Figure 2). Conservation staff make efforts to monitor areas and species vulnerable to drought, yet their resources for doing so are currently limited. Greater staff capacity and expanded monitoring even prior to drought onset could increase understanding of drought impacts and managers' ability to reduce negative drought effects.

Staff Capacity & Morale

Drought can take a toll on people who work to protect and enhance natural resources:

- Increased field worker fatigue and greater need for breaks due to higher temperatures and less cloud cover
- Heightened worry about potential wildfire impacts
- Grief over plant losses and species extinction
- Loss of morale-boosting field amenities like campfires
- Uncertainty over long-term viability of restoration and conservation efforts, particularly when considering climate change.

In some ways extended dry periods can be helpful for staff capacity and morale. For example, crews may get some respite from weed control, and consistently clear skies enables efficient use of helicopter resources in field operations.

“When you're out in the field, one of the simple pleasures that is afforded to you is having a campfire. To prevent wildfires during a drought, barbecue pits will get taken down. We have crews that camp 20 weeks a year. . . We have a tremendous amount of field time.

Taking something like that away has an effect on morale. . .

When you don't have a barbecue and you don't have that heat source when you're camping out in higher elevations, it has an effect.”

Mahalo to 24 anonymous Hawai'i natural resource managers and land stewards whose interview responses on drought provided most of this factsheet's written content.

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“I actually saw a plant species go extinct in the field. Cyanea pinnatifida. It's kind of an intense experience. I remember getting a lot of questions like 'What was it?' And it wasn't just one thing. It's a lot of things. But the underlying thing is drought, I think.”



Figure 2: Monitoring Haleakala silverswords (*Argyroxiphium sandwicense*). Credit: Forest & Kim Starr.

Funding Responses to Drought

Drought can indirectly affect the financial resources available to people engaged in land stewardship. Money may become available through federal and state agencies for things like wildfire hazard reduction and offsetting livestock mortality. On the other hand, if private landowners face business losses from drought they may have fewer resources for stewardship activities on their lands. Drought may also undo or threaten the conservation successes of grant-reliant organizations, making it harder for them to maintain and compete for funding. Improving available information on an area's drought history and best practices for ecosystem resilience can support clear communication between those who address ecological drought and their funding organizations.

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