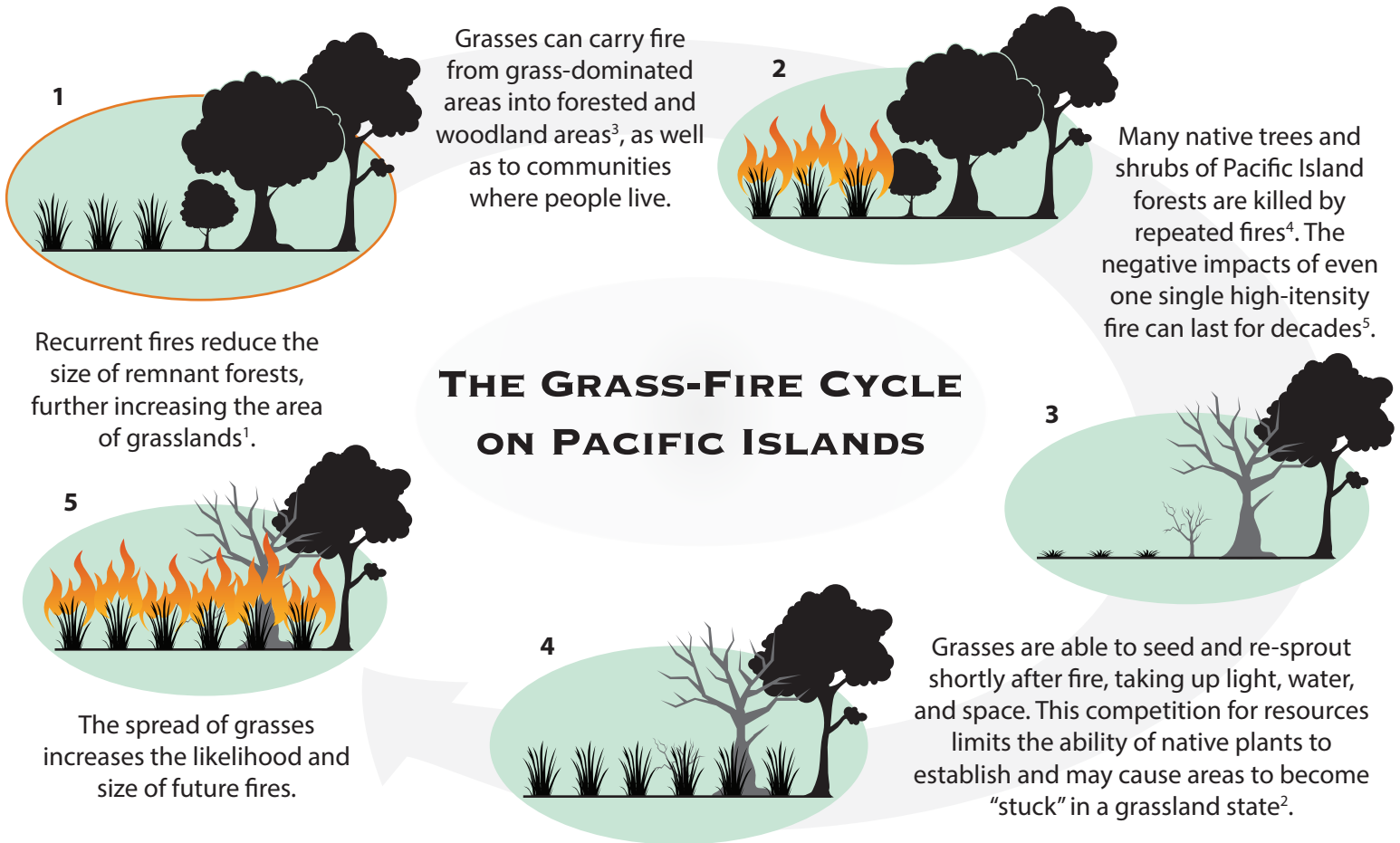


DID YOU KNOW?

- Grasses fuel frequent wildfires across large areas in the Western Pacific islands and Hawaii¹. Most of these grasses are non-native invasive species. In the Western Pacific native grasses have also become nuisance species due, in part, to fire.
- The positive feedback between grasses and wildfire, known as the Grass-Fire Cycle, increases fire risk and can dramatically change native ecosystems².
- Understanding the Grass-Fire Cycle can help to better manage grasslands and savannas, reduce the risk of wildland fire, and limit the impacts of fire on our communities, watersheds, and native ecosystems.



Why do grasses burn easily?

Grasses are "fine fuels" that retain a lot of dead plant material and dry out quickly after rainy weather.

Annual dry seasons and episodic drought, especially in the Western Pacific, create conditions where grasses easily catch fire and burn rapidly.



HUMANS PLAY A KEY ROLE | Ignition Sources & Plant Introductions

For centuries in Guam, Yap, and Palau people have set fires to clear land, resulting in a great expansion of native grasses like sword grass (*Miscanthus floridus*) as well as invasives like cogongrass (*Imperata cylindrica*)⁶.



Fire was also used to manage native grasslands in Hawaii. However, the introduction of non-native grasses for ornamental plants and cattle forage¹ has transformed many of Hawaii's landscapes over the past century. Many of these grasses - like fountain grass (*Cenchrus setaceus*) and Guinea grass (*Megathyrsus maximus*) - are invasive and adapted to thrive with fire.

The grasses in both Hawaii and the Western Pacific have moved into woodland and forest areas dominated by native trees and shrubs, bringing the increased threat of fire with them. The extent and continuity of grasslands makes Pacific Islands susceptible to both intentional and unintentional human fire starts, whether from arson, cigarettes, vehicle and machinery sparks, unattended campfires, or fireworks.

HUMANS PLAY A KEY ROLE | Management Strategies

Grass-dominated landscapes occupy large portions of the US Affiliated Pacific Islands (see Figure 1). Many of these areas were formerly managed for other uses. Land abandonment - letting landscapes go unmanaged - often leads to conversion of those areas to grasslands with increased fire risk. Despite what these grasslands used to be, they are now fire-adapted ecosystems because the less fire-tolerant species have been displaced from them. Research indicates that grasses can persist for decades even without fire coming back, and that grasses limit the recovery of native forest without active human intervention⁵.

Different land use strategies are key to limiting the grass fire cycle. These strategies include livestock grazing, diversified farming, and forest restoration. The challenge is implementing or reestablishing land uses at large scales over the landscape.

Ecosystem Restoration

Planting native trees and shrubs in fire-impacted areas can exclude non-native trees and grasses over time⁷. In practice, this is challenging because many grasses and non-native plants grow faster than native plants and outcompete them in the post-fire environment.



In addition to possible weed control, plants in restoration areas need protection from fire (see Traditional Fire Management below) until they can competitively exclude non-native grasses.

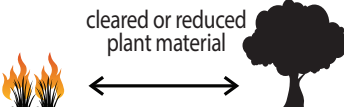
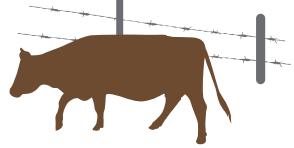
Traditional Fire Management | In addition to ecosystem restoration more traditional approaches to fire and fuels management are recommended. These approaches include:



Controlling ignition sources.
Most fires on Pacific Islands are initiated by human activities. Prevention and management actions include public outreach and limiting access.


Installing and maintaining fuel breaks.
Fuel breaks can reduce the intensity and speed at which fires burn, creating much safer access areas for firefighters to use to control wildfires.

Fuel Break: Area of cleared or reduced plant material

Managed grazing.
Where conditions and infrastructure allow, livestock grazing can be an effective tool to reduce fuels and maintain fuel breaks over large areas⁸.

Opportunistic stewardship.
If an area does burn, consider using the window of reduced grass to seed with desirable native plants and use spot herbicide application to minimize grass regrowth in seeded areas.



FUTURE WORK Only a few studies have examined the changes in Pacific Islands ecosystems and plant composition following wildfire, and they cannot reflect every landscape affected by fire in the Pacific. For more specific Grass-Fire Cycle management recommendations that fit the different cultures, ecosystems, and landscapes across the Pacific, more knowledge must be gathered, generated, and shared by communities, landowners, land managers, and researchers. If you have management strategies or projects that aim to limit or break the Grass-Fire Cycle that you'd like to share, please contact the Pacific Fire Exchange (info@PacificFireExchange.org).

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Vector graphics from www.Vecteezy.com

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Land Cover as of 2013

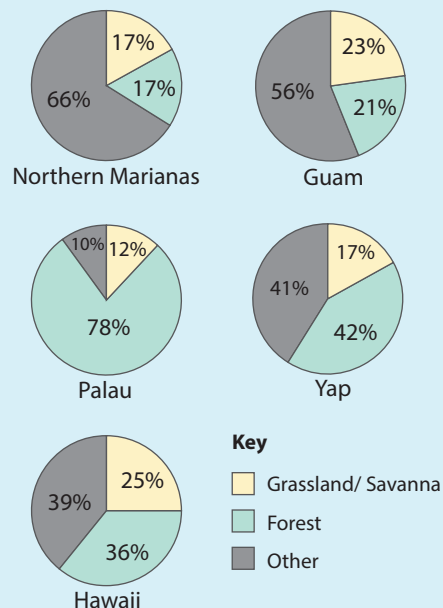


Figure 1. Land cover of Pacific Islands. The composition of landscapes has changed, and continues to change, due, in part, to human activities and the Grass-Fire Cycle. Data Source: www.LANDFIRE.gov