Grazing to Reduce Blazing

Pacific Fire Exchange

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JOINT FIRE SCIENCE PROGRAM

Did You Know?

- ***Unmanaged*** grazing by ***feral animals*** is different from ***agricultural grazing*** with targeted objectives
- Domestic livestock help maintain ***hundreds of miles of firebreaks*** in Europe and the Mainland US
- ***Grasslands & shrublands*** represent the ***majority of area burned*** by wildfire in Pacific Islands
- ***Nonnative species commonly dominate*** these grasslands and shrublands
- Fires started in nonnative grasslands ***often spread to adjacent areas with native species***, thus
- ***Strategic application*** of managed grazing can reduce fuel loads and fire threat while contributing to broader land management goals

A Closer Look

Nonnative grasses have been introduced throughout the world for use in ranching or as ornamental plants. In many places these grasses invade native ecosystems and fallow agricultural lands (Fig. 1). The impact of nonnative grasses is particularly evident in lowland ecosystems in Hawaii, where widespread monocultures create large and continuous fuel loads. In the Western Pacific, nonnative grasses can invade and alter the fuel loads in areas of native savanna vegetation.

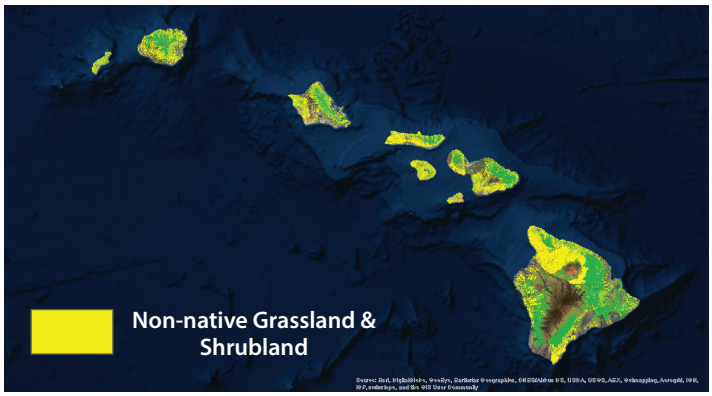

Figure 1. Yellow indicates areas dominated by nonnative grasses, equal to 24% of land cover in Hawaii. (Hawaii GAP Analysis)

Combined with increased ignition sources via human activities, these fuel loads increase the frequency, size, and risk of wildfires. Wildfires, and hence, grass invasions, threaten native ecosystems and promote further grass establishment, creating a positive feedback loop called the grass-fire cycle.

Controlling established areas of nonnative grasses is labor intensive and costly. Most invasive grass eradication efforts rely on repeat herbicide applications and/or mechanical removal.

Reducing wildfires in grass-invaded areas helps protect surrounding human communities and native forest ecosystems.

Livestock grazing presents an alternative fuel reduction method. More research and collaborative relationships are needed to further develop effective implementation strategies.
See reverse side to learn more.

Fire-Prone Invasive Grasses

- Fountain Grass (*Cenchrus setaceus*)
- Broomsedge (*Andropogon virgnicus*)
- Molasses Grass (*Melinis minutiflora*)
- Mission Grass (*Pennisetum polystachion*)
- Buffelgrass (*Cenchrus ciliaris*)
- Guinea Grass (*Megathyrsus maximus*)

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Research on Grazing & Fuel Loads

Domestic livestock grazing shows potential as a cost effective method for reducing fine fuel loads and wildfires in nonnative grasslands (Fig. 2). While controversial and typically considered incompatible with native species conservation, the use of grazing to reduce fuel loads and wildfire risk has been successful throughout the world.

It is ***important to distinguish*** the negative impacts of ***unmanaged grazing*** by feral animals from the potential benefits of ***targeted, carefully managed grazing*** for wildfire risk reduction.

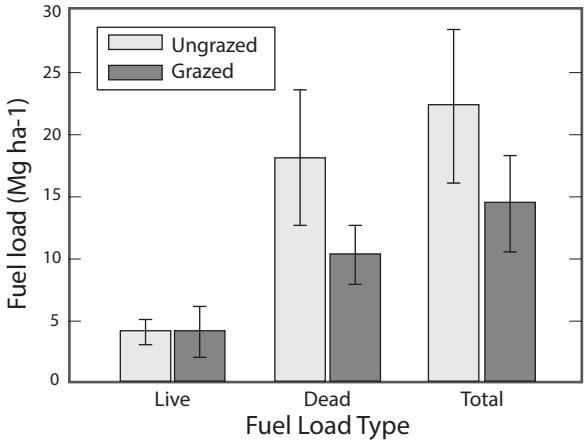

Figure 2. Impact of grazing on fine fuels. Ungrazed areas have higher fuel loads compared to grazed areas. (Evans, Ellsworth, and Litton 2015)

In Hawaii, grazing by cattle and sheep has been shown to reduce fuel loads and predicted fire intensity in nonnative grasslands (2,3,4). Experimental trials in nonnative grasslands in Hawaii also indicate that the effects of grazing on fuel loads may last longer than chemical and mechanical treatments (1). These findings suggest that livestock grazing has potential as a valuable fire management tool in nonnative-dominated grasslands in Hawaii and throughout the Pacific Island Region.

Moving Forward - New Partnerships & Economic Models

Implementing grazing for fuels reduction will require partnerships and close collaboration between ranchers and land managers (who may have little experience with livestock). It may also require a shift away from traditional economic models in which ranchers pay landowners for forage, to a new system that considers grazing for fuels reduction as a service. For instance, farmers in Europe are paid to maintain hundreds of miles of firebreaks with their livestock.

Needed Research

Further work is needed to identify how domestic livestock grazing can be best used as a management tool in the Pacific for reducing fine fuel loads.

- **Appropriate livestock species and grazing intensity for specific vegetation types (i.e. woody plants vs. grasses)**
- **Seasonal timing of grazing for greatest fuel reduction efficacy**
- **Cost-benefit analysis of fuel reduction, forage quality, impacts to soil & native species, and livestock needs (i.e. fencing, water)**
- **Effects of feral ungulate grazing in natural areas on fuel loading and subsequent fire behavior**

Additional Resources

1. Nader, G., Z. Henkin, E. Smith, R. Ingram, and N. Narvaez. 2007. Planned Herbivory in the Management of Wildfire Fuels. Rangelands 29:18–24

2. Thorne, M., and M. Stevenson. 2007. Stocking Rate: The Most Important Tool in the Toolbox. University of Hawaii Cooperative Extension Service Publication PRM-4.

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2. Blackmore, M., and P. M. Vitousek. 2000. Cattle grazing, forest loss, and fuel loading in a dry forest ecosystem at Pu'u Wa'awa'a Ranch, Hawaii. Biotropica 32:625–632.

3. Castillo, J., G. Enriques, M. Nakahara, D. Weise, L. Ford, R. Moraga, and R. Vihnanek. 2007. Effects of cattle grazing, glyphosphate, and prescribed burning on fountain grass fuel loading in Hawaii. Pages 230–239 Proceedings of the 23rd Tall Timbers Fire Ecology Conference: Fire in Grassland and Shrubland Ecosystems.

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5. Warren, S., S. Sherman, and J. Zeidler. 2007. Assessment of Livestock Grazing on Fuels and Cultural Resources at Makua Military Reservation (MMR), Island of Oahu, Hawaii. Center for the Environmental Management of Military Lands, Fort Collins, CO.

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