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Native Plant Restoration Not Enough to Maintain Tropical Dry Forests in Hawaii

Hilo, Hawaii.—Protecting Hawaiian dry forests from invasive species and the risk of wildfire is an on-going challenge for land managers and scientists conducting research on the Island of Hawaii. It is commonly thought that removing the invasive species and planting native species will restore the land to its original state. However, in a recent paper published in *Biological Invasions*, Dr. Susan Cordell, USDA Forest Service Pacific Southwest Research Station, Institute of Pacific Islands Forestry; Dr. Erin Questad, Cal-Poly Pomona; and Dr. Jarrod Thaxton, University of Puerto Rico found that it is not quite that simple.

The research team has been working at the Kaupulehu dry forest reserve on the Island of Hawaii for the past decade. The largest current threat to this unique and endangered ecosystem is the spread of non-native fire-promoting grasses, in particular, fountain grass or *Pennisetum setaceum*.

To test characteristics of ecosystem resilience in this dry tropical forest, the researchers allowed natural rates of re-invasion of non-native species into an existing restoration project and looked at how effective restoration projects were at enhancing invasion resistance. They paid particular attention to the relationship between invasibility and native plant diversity.

Key findings from the research include:

- Higher invasion rates occurred in plots that supported the most native species, suggesting that similar mechanisms may regulate the distribution of both native and invasive species.
- Fountain grass was associated with native plant mortality and declines in native diversity, particularly in areas with harsh environmental conditions (i.e. steep slopes, little soil, exposed terrain).
- Native woody plant restoration alone was not an effective tool for weed control in this community, and continuing invasion may result in declines in native diversity in the long term.

“We have spent a considerable amount of time understanding the role of restoration on non-native plant invasion,” says Dr. Cordell. “In the short term, restoration of native species serves to improve invasion resistance—but results from this study also indicate that long-term sustainability of restoration projects will require continued non-native species management.”

These findings suggest the need for consideration of long-term sustainability measures in restoration plans for tropical dry forest ecosystems in Hawaii.

To read the full report, “Patterns and Consequences of Re-invasion into a Hawaiian Dry Forest Restoration,” go to: <http://treearch.fs.fed.us/pubs/40891>

Headquartered in Albany, Calif., the Pacific Southwest Research Station develops and communicates science needed to sustain forest ecosystems and other benefits to society. It has research facilities in

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