

HAWAII TROPICAL DRY FORESTS



Mamani forest, western slope of Mauna Kea, Hawaii. Source: David Olson

Hawaii tropical dry forests typically occur on the leeward side of the principal Hawaiian Islands (that is the side not exposed to the prevailing winds as they come ashore), and once covered the summit regions of the smaller islands.

WWF Terrestrial
Ecoregions Collection

The areal extent of the Hawaii tropical dry forests is only about 6600 square kilometers. Most of the native lowland forests of Hawaii are either seasonal or sclerophyllous to some degree, and more **mesic** transition forests occur where conditions are favorable. These transition forests include mixed mesic forests that often contain patches and elements of dry forest communities. The Hawaii tropical dry forests have a pronounced dry season from April to October, with rainy season precipitation ranging from 25 to 125 centimeters.

These dry forests along with other Hawaiian ecoregions developed in relative isolation from Earth's other regions for the most recent 28 million years, generating extremely high levels of endemism. However, arrival by the Polynesians and then Western man brought waves of habitat destruction and mismanagement, including poor modern decisions by governmental agencies regarding land planning. Consequently about one third of the taxa in this ecoregion are threatened, and a large number are already extinct.



Biological distinctiveness

Dry forests throughout the world vary from closed to open canopied forests, can exceed 20 meters in height in montane habitats, and are typically dominated by the plant genera *Acacia*, *Chamaesyce*, *Metrosideros*, *Sapindus*, *Sophora*, *Pritchardia*, *Pandanus*, *Diospyros*, *Nestegis*, *Erythrina*, and *Santalum*; in particular the Koa Tree (*Acacia koa*), a Hawaiian endemic, is a dominant canopy species in the Hawaii tropical dry forests. These dry forests previously harbored the spectacularly beautiful endemic Moloka'i Tree Cotton (*Kokia cookei*), which is now considered Extinct in the Wild. Dry forests here also hold a number of specialist species including native hibiscus trees of the genus *Hibiscadelphus*, the Critically Endangered Uhiuhi (*Caesalpinia kauaiense*), and Mountain Sandalwood (*Santalum paniculatum*), and several rare endemics such as Chewsticks (genus *Gouania*), now represented by only a small number of individuals; Hairyfruit Chewstick (*Gouania hillebrandii*) is an example of one of the species within this genus.



Maui Parrotbill. R.H. Porter 1890-1899

Around 22 percent of the native Hawaiian plant species occur within this ecoregion, but with a lower habitat type endemism than tropical moist forests. The Critically Endangered Palila (*Loxioides bailleui*), a finch-like bird, specializes in mamane trees that occur in dry forest habitats. Several shrubland, grassland, and herbaceous formations occur within this ecoregion. There are no native amphibians or reptiles or mammals present, and there is a single native mammal in the Hawaii tropical dry forests: the Hoary Bat (*Lasiurus cinereus*). There are 69 bird taxa found in the Hawaii tropical dry forests. Lower Hawaiian dry forest was previously the habitat for numerous forest birds, such as honeycreepers, flycatchers, flightless rails, other now extinct flightless birds, and the Pueo, an Hawaiian owl (*Asio flammeus sandwichensis*).

Several Critically Endangered bird species are found in this ecoregion, including the Ou (*Psittirostra psittacea*); the Maui Parrotbill (*Pseudonestor xanthophrys*), which is now restricted to the island of Maui, with a precarious population of fewer than 500 birds; the Olomao (*Myadestes lanaiensis*), endemic to the central Hawaiian Islands, but not sighted since 1980; the Oahu Creeper (*Paroreomyza maculata*), endemic to the island of Oahu and last seen in 1985; the Nukupuu (*Hemignathus lucidus*), seen no later than the 1990s and possibly extinct.

Conservation status



Hawaii Volcanoes National Park, Hawaii. Source: David Olson

Habitat loss

Tropical dry forests are globally threatened, and Hawaiian dry forests have been reduced by 90 percent. Clearing and burning of lowland dry forests began with arrival of Polynesians and the last remnants are being destroyed today through development, expansion of agriculture and pasture, and burning. Most larger fragments of relatively intact dry forests are in montane areas.

Remaining blocks of habitat

A few relictual areas survive such as Pu'u Wa'awa'a on Hawai'i, Pu'u o Kali on Maui, Auwahi on Maui, Kanepu'u on Lana'i, and small stands (a few thousand square meters) in the Wai'anae mountains of O'ahu that is currently surrounded by burned slopes or alien-dominated vegetation. Several other important dry forest conservation sites identified by Sohmer and Gon include the Na Pali Coast of Kaua'i, East Moloka'i Mountains, West Maui Mountains, Leeward East Maui, Lana'ihale-Kanepu'u of Lana'i, and the Kona Subregion of Hawai'i.

Degree of fragmentation



Auwahi dry forest on Hale'akala, Maui. Source: Arthur Madeiros

What little dry forest habitat that remains is highly fragmented. This phenomenon is also elucidated in the case of the few successful forest restoration projects such as the Auwahi dryland forest on Maui.

Degree of protection

Remaining transition forests and dry forests are poorly represented in the existing protected areas system. Strong protection and active management of the remaining remnants of Hawaiian dry forests are needed. Research on effective restoration methods is needed.

Types and severity of threats

Introduced plant species are widespread and dense growth and competition for resources prevents the establishment of native plant seedlings. The African Fountain Grass (*Pennisetum setaceum*), the shrub Largeleaf Lantana (*Lantana camara*), and Molasses Grass (*Melinis minutiflora*) are among the major problem invasive plant species. Introduced rats, plants, and seed-boring insects, grazing by domestic livestock and introduced deer, goats, and pigs, as well as recurring fires inhibit almost any regeneration of native species in most altered habitats with

Conservation partners

- The Nature Conservancy
- The Nature Conservancy of Hawaii
- Hawaii Natural Heritage Program

Relationship to other classification schemes

The Hawaii dry forests correspond to Kuchler's units One (Sclerophyllous forest, shrubland, grassland), Five (Koa forest), and Six (Koa-mamami parkland). Omernik did not address the classification of the Hawaiian Islands, and Bailey lumped all of Hawaii into a single unit.

Source : <http://www.eoearth.org/view/article/51cbedf47896bb431f69504c/?topic=51cbfca2f702fc2ba8130a8c>