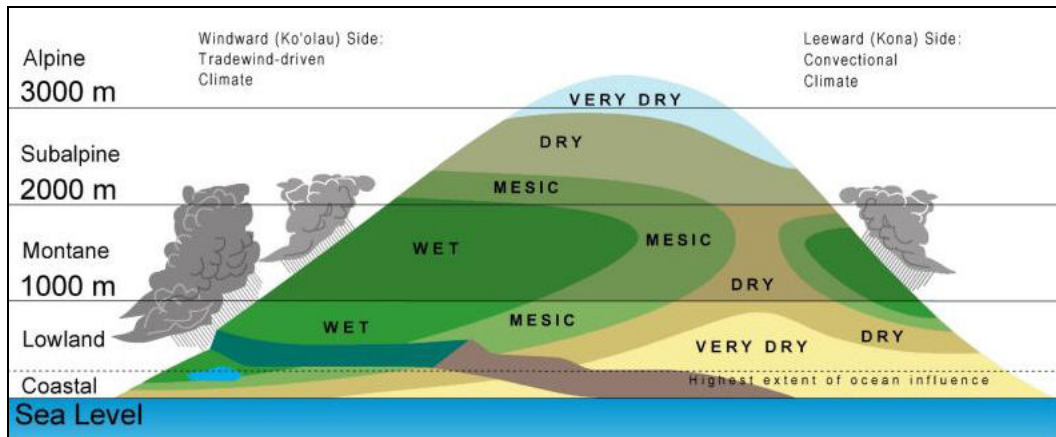


1.0 INTRODUCTION

1.1 VALUE OF MESIC FORESTS IN HAWAII



Our understanding of the value of mesic forests is just beginning, even as they are disappearing. Just the classification ‘diverse mesic forests’ denotes the existence of a forest type so evenly composed in its makeup that not one tree species dominates the community. A mesic forest is a forest type that is neither wet nor dry, generally receiving 120-150 cm of rainfall annually. As listed in the Manual of Flowering Plants (Wagner et. al. 1999), mesic forests are found in coastal, lowland, and montane areas in elevations ranging from 15-2200 meters.

Table 1A: Native and Alien Dominated Mesic Forest Communities

Coastal Mesic Forests

- Hala (*Pandanus*) Forest
- Loulu (*Pritchardia*) Coastal Forest
- Common Ironwood (**Casuarina*) Coastal Forest

Lowland Mesic Forests

- Ohia (*Metrosideros*) Lowland Mesic Forest
- Koa (*Acacia*) Mesic Forest
- Olopuu (*Nestiges*) Lowland Forest
- Lama/Ohia (*Diospyros/Metrosideros*) Mesic Forest
- Diverse Mesic Forest
- Loulu (*Pritchardia*) Lowland Forest
- Papala Kepau/Papala (*Pisonia/Charpentiera*) Riparian Forest
- Kukui (**Aleurites*) Forest
- Guava (**Psidium*) Forest
- Common Ironwood (**Casuarina*) Lowland Forest
- Silk Oak (**Grevillea*) Forest

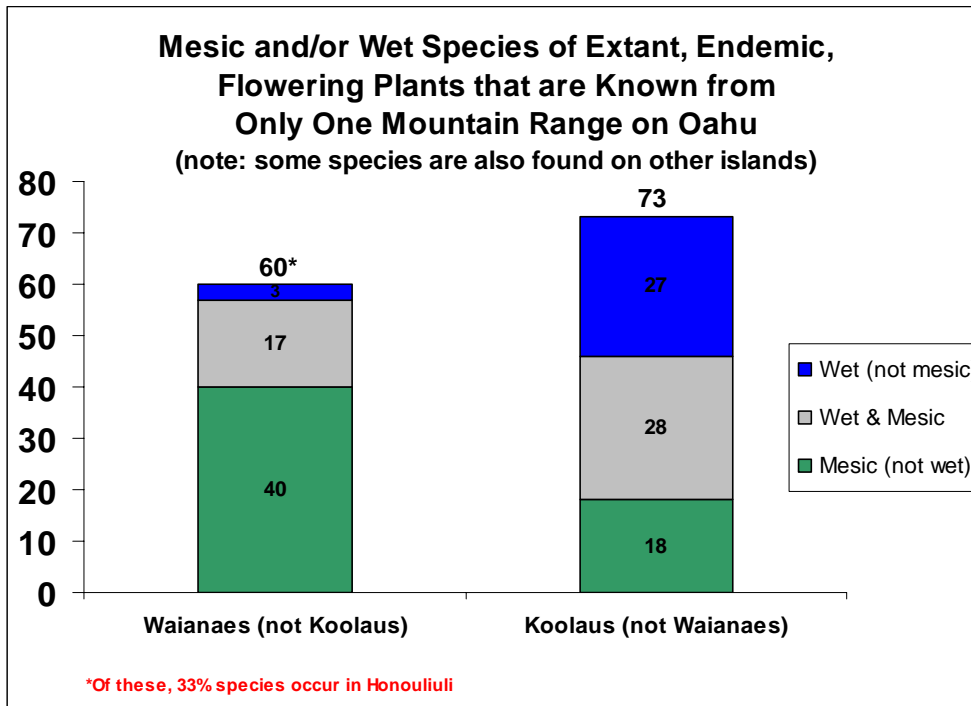
Montane Mesic Forests

- Ohia (*Metrosideros*) Montane Mesic Forest
- Koa/Ohia (*Acacia/Metrosideros*) Montane Mesic Forest
- Koa/Ohia/Ae (*Acacia/Metrosideros/Sapindus*) Forest
- Olopuia (*Nestiges*) Montane Forest

*Denotes non-native species
 From Wagner et. al. 1999

Within this scattered mosaic of mesic forests lie some of Hawaii’s rarest biological riches. Largely because of biogeography and a myriad of microclimates between the dry, lowland vegetative communities below and the wet forests above, mesic forests are storehouses of floral endemism.

The following example from an analysis by Jonathan Price of the floral diversity of Oahu, highlights the number of plant species found in mesic communities.



Source: J. Price

If one excludes indigenous and extinct flowering plant species when compiling totals of all native plant species by major vegetation communities, mesic and wet forests clearly contain the bulk of endemic plant species.

TYPE	NUMBER OF SPECIES
Subalpine	96
Wet	494
Mesic	511
Dry	214
Coastal	73

Source: T. Menard



Lowland mesic forest, Honouliuli Preserve on Oahu. Home to over 90 rare and endangered plant and animal species.

Unfortunately Hawaii is infamously known as the one of the ‘extinction capitals of the world’ as a result of the loss of most of the native lowland dry and mesic forests across our state. Only the mere remnants of a once rich ecological tapestry of plant and animal species remain. Despite their highly fragmented status, protection of mesic forests remains a priority for the following reasons (adapted from Porteous 1993).

- **Refugia for Native Plants and Animals**

As noted above, mesic forests support a great diversity of plant species. Forest protection is also wildlife habitat protection. The number of rare plant and animals that continue to persist in mesic forest areas alone warrant protection to avoid global extinction.

- **Reference Sites for Scientific Study, Restoration Activities, and Ahupuaa management**

An intact, native mesic forest is a living link to the past providing an invaluable guide to efforts focused on restoring viable, functioning forest systems. Remnant native forest areas offer opportunities to understand the complex interrelationships of abiotic and biotic systems in a living laboratory.

- **Watershed Protection**

Given the recent drought and the growing human population in Hawaii, watershed protection is perhaps one of the most important long-term activities facing natural resource managers in Hawaii. Wet forests are credited with capturing the bulk of

rain water. However, mesic forests play a highly significant role in supplementing groundwater recharge rates and buffering wet forested areas from the effects of ungulate damage, deforestation from land use changes, and fires.



Flyways and banding of Oahu Elepaio birds at Honouliuli Preserve

- **Wildlife Corridors**
Native invertebrates, birds and bats continue to thrive in mesic forest areas despite significant conversions to non-native forests due to human activities and plant and animal invasions. Native moths, spiders, and pomace flies are a few categories of the invertebrates of mesic forests that are just now beginning to be fully identified and described by scientists. Native forest birds such as the amakihi, apapane, io, and iiwi and the opeapea (Hawaiian hoary bat) continue to utilize mesic forests as important wildlife corridors when making local migrations to feeding areas up and down mountain slopes.
- **Genetic Diversity**
Because a number of plant and animal species occur in both wet and mesic forests, protection of mesic forests offers the best chance at preserving the full complement of genetic variation within plant and animal species. Loss of genetic variation is a loss of what makes a species uniquely native Hawaiian. With the onset of global warming, species will probably need their full set of genetic variability to adapt over time to a changing environment.
- **Importance to Hawaiians**
Seeing to Hawaiian spiritual needs...forests also feed the spirits of artists and healing practitioners (Gon 2003). Mesic forest remnants continue to provide sources of medicine, materials, and foods for native Hawaiians.
- **Character of Hawaii's Landscape**
Mesic forests are also some of Hawaii's most accessible forests for recreational and aesthetic enjoyment. Hiking and hunting remain popular pastimes for Hawaii's locals and ecotourism operations are a growing segment of the tourism industry. Continued degradation or loss of mesic forests areas are very real losses to our quality of life in Hawaii.

We would certainly be wise to protect and restore the native mesic forests that remain given the many ecological services and human values associated with them.



Honouliuli ahupuaa

One need only look carefully at the State Seal of Hawaii to gain inspiration for forest restoration efforts. A phoenix rises from the flaming ashes with native lobelia plants below and native maidenhair ferns above.



The translation of the state motto itself reinforces this need. The motto is most commonly translated as, ‘the life of the land is perpetuated by its righteousness.’ The word ‘pono’ has many meanings. Some would argue the state motto should be ‘the life of the land is perpetuated by its sovereignty.’ In the hearts and minds of Hawaiian conservationists, it may very well be translated as, ‘the life of the land is perpetuated by its native integrity.’

1.2 MESIC FORESTS LOCATIONS IN HAWAII

Kauai: Kauai contains some of the best remaining examples of lowland mesic forests and the island contains an extraordinary number of single-island endemic plant species. The following list highlights areas of remaining diverse mesic lowland forest (Massey pers. comm.).

- Kalalau and Pohakuao Valleys within the Na Pali Coast State Wilderness Park
- Mahanaloa, Paaiki, Kuia, and Poopooiki areas within the Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve
- Koaie Canyon (including Kawaiiki and Hipalau Valleys) within Waimea Canyon State Park
- Olokele Canyon and Kahana Valley on private land.

Oahu: Oahu also has a number of diverse mesic and lowland mesic forest areas. In the Koolau Range, the mesic areas quickly grade into lowland wet ohia forest. In the Waianae Range, larger areas of lowland mesic and even diverse mesic forest remain, but are generally much more degraded.

- Koolau: Hawaii Loa Ridge Trail and adjacent gulches
- Koolau: Halawa Ridge Trail
- Koolau: Makaua Valley/Kahana Valley
- Koolau: Maakua Gulch
- Koolau: Manana/Waimano Valleys

- Waianae: Kahanahaiki Gulch
- Waianae: Pahole Natural Area Reserve
- Waianae: East and West Makaleha Valleys
- Waianae: Palikea Gulch
- Waianae: Makaha and Waianae Kai Valleys
- Waianae: Mohiakea and Haleauau Gulches (above active artillery range)
- Waianae: Honouliuli Preserve (Kaluaa, Ekahanui, Pualii, and Palawai Gulches)

Maui and Molokai: This list is still being researched.

- West Maui: Kapunakea Preserve
- East Maui: Makawao Forest Reserve

Hawaii: As the youngest island, Hawaii does not have the same level of plant biodiversity found on the older islands such as Kauai and Oahu. However it does contain areas of relatively intact mesic forests. This list is also still being researched.

- Manuka Natural Area Reserve
- Hawaii Volcanoes National Park: Mauna Loa Strip Road area and the various kipukas located off the road, in particular, Kipuka Puaulu and Kipuka Ki.

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