

State of Hawaii  
Department of Land and Natural Resources  
Division of Forestry

FORESTRY IN HAWAII

HISTORY OF FORESTRY:

<sup>1</sup>The history of forestry in Hawaii pre-dates the organization of Hawaii as a Territory of the United States. Kamehameha III in 1846 and his legislative body passed a law which stated the forest shall be considered as government property. Later in 1876 the legislature passed a law which was in the nature of an eminent domain statute to prevent forest destruction and consequent diminution in water supply. These were followed by numerous laws set up to prevent the destruction of forest vegetation, until 1903, when the legislature passed a law to create a Board of Commissioners of Agriculture and Forestry to devise ways and means of protecting and extending forest reserves in order to protect and develop water resources.

<sup>2</sup>With the increase in the acreage of forest reserves in the Territory of Hawaii, to over one million acres, it may be of interest to the rest of the forestry world to know what is being done in the way of practicing forestry for water conservation in this group of Pacific Ocean islands.

The first forest reserve in Hawaii was set aside by proclamation of the Governor on November 10, 1904, on recommendation of Ralph S. Hosmer, then Superintendent of Forestry.

During the 53 years since the work of forestry began, forest reserve has expanded and progressed until this day, on the six largest islands, there are 63 forest reserves varying in size from 10 to 160,000 acres with a total area of 1,201,000 acres, of which 68 percent is owned by the Territorial government. This amounts to almost 30 percent of the total land area of the territory and is considered none too large to assure the growing population of a continuous and sufficient water supply. Of the 32 percent in private ownership, 352,174 acres have, under the law, been turned over to the care and control of the territory for varying periods of time.

AREA OF FOREST RESERVE:

The total area of the six islands listed below is a little over four million acres or 6,400 square miles. Most of this area is of mountainous nature, the maximum altitudes of the islands varying from 2,000 to 14,000 feet in elevation. The cultivated areas of the islands constitute a relatively small part of the total; approximately 30 percent of the entire area is covered by forest.

<u>Acres in Forest Reserves</u>		
<u>Island</u>	<u>Area in Reserve (acres)</u>	<u>Total Area of Islands (acres)</u>
Kauai	165,000	350,000
Oahu	123,000	382,720
Maui	159,000	466,000
Molokai	46,000	167,000
Lanai	6,000	89,305
Hawaii	702,000	2,570,000
	<u>1,201,000</u>	<u>4,025,025</u>

## FUNCTIONS OF DIVISION OF FORESTRY:

Functions of the Division of Forestry are concerned with watershed management and the establishment, improvement and protection of forest reserve areas, regulated under Section 1006, Chapter 16, Revised Laws of Hawaii 1945.

### Care of Forest Reservations

To have care, custody, control and regulation of all lands which may be set apart as forest reservations.

### Protection of Forests and Water Supply

To devise ways and means of protecting, extending, increasing and utilizing the forests and forest reserves, more particularly for protecting and developing the springs, streams and sources of water supply, so as to increase and make such water supply available for use.

### Self Support of Forests

To devise and carry into operation, ways and means by which forests and forest reservations can, with due regard to the main objects in this chapter set forth, be made self-supporting in whole or in part.

### Fencing and Exclusion of Stock

To secure as speedily as possible, either by private cooperation or by public appropriation, the erection and maintenance of fences to exclude livestock from forest reservations and the removal from such reservations of the livestock running thereon, including the killing of the same, if necessary.

### Further Legislation

To formulate and from time to time recommend to the governor and legislature such additional legislation as it deems necessary or desirable for better securing of the objects of this chapter.

## WATERSHED MANAGEMENT:

Watershed management is the administration and regulation of the combined resources of a drainage basin for the production of water and the control of erosion, stream flows and flood.

The purpose of watershed is to sustain yield of water, obtain maximum yield flow of water and retain stability of soil.

The watersheds in Hawaii are subject to heavy rainfall as compared with other parts of the world where forest influence studies have been made. There is a tremendous variation in the average annual rainfall within a relatively short distance. The amount varies from ten inches in the driest area to more than 400 inches in the wettest area.

<sup>1</sup>Rainfall on Hawaiian watersheds comes primarily from two types of meteorologic phenomena: (a) Large scale pressure disturbances which provide general rainfall over the Territory; (b) Orographic forced rise of air masses either by underrunning cooler wind, or by the flow of air over barriers of cold air or land elevation. The orographic process provides smaller amounts each day but since it is a more constant action, the accumulated total rainfall represents an appreciable proportion to the annual accumulation.

From the mountains and foot-hills of the watershed come the principal sources of our water supply. The present trend in the Territory is moving agriculture, industries and communities closer to the foot of the mountain and many instances to the mountain. This encroachment is very detrimental to our watershed, especially in Honolulu where land is scarce and at a high premium. As agriculture, industries and communities encroach the watershed area it will reduce the infiltration area of our source of water. The future growth of Honolulu will be vitally affected by the water supply obtainable from this artesian area.

#### MANAGEMENT PROGRAM:

The selection of species in the past for reforestation programs was dependent mainly on the supervisor of forestry; also, the availability of the planting stock and the influence of other reforestation progress resulted in the planting of many different species.

Over 200 different species have been planted in the Territory for reforestation purposes to meet the wide variation of planting sites on areas of high and low elevation and rainfall.

Early plantings were mainly for re-establishing cover on our denuded forest areas for watershed protection, and with not too much attention to the selection of species which may produce timber of commercial qualities. But it is fortunate that in this period many different species were planted for reforestation because it has now left sample plantations from which information is now being secured to give guidance to future reforestation programs.

Failure of most of the early reforestation was probably due to:

- a. Planting of species in unproductive farm crop areas.
- b. Inferior planting practice.
- c. Competition from noxious weeds and shrubs.
- d. Species not adaptable to site condition.

At present species are being selected for reforesting on the basis of:

- a. Commercial qualities.
- b. Adaptability to local site conditions.
- c. Hardiness.
- d. Availability.

After 30 years of extensive forest planting of various exotic species, some of the trees have now attained maturity; so at present another phase of investigation--that of wood utilization--is being made especially on the island of Hawaii.

Several specimens of Hawaii-grown trees have been shipped to the Wood Products Laboratory in Madison, Wisconsin, to be tested to see if trees grown in Hawaii have favorable characteristics as trees of the same species grown in other parts of the world for timber.

Once this phase of research is completed, the Division of Forestry can concentrate on an intensive planting program of a few favorable commercial type species.

Listed below are some of the more potential commercial timber trees being planted in the Territory:

Acacia confusa - Formosan koa	Eucalyptus pilularis - Black butt
Acacia koa - Koa	Eucalyptus robusta - Swamp Mahogany
Acacia melanoxylon - Blackwood	Eucalyptus saligna - Flooded Gum
Albizzia marginata	Fraxinus sp. - Tropical Ash
Albizzia moluccana - Sau	Grevillea robusta - Silk Oak
Albizzia procera - Acleng Paranog	Juglans nigra - Black Walnut
Aleurites fordii - Tung	Juglans regia - English Walnut
Alnus nepalensis - Nepal Alder	Juniperus bermudiana - Bermuda Juniper
Araucaria excelsa - Norfolk Island Pine	Ochroma lagopus - Balsa
Bischofia javanica - Fuai	Pinus patula - Soft Needle Pine
Cassia multijuga - Timor Shower	Pinus pinea - Soft Pine
Casuarina equisetifolia - Ironwood	Pinus radiata - Monterey Pine
Casuarina glauca - She Oak	Pinus taeda - Loblolly Pine
Cedrela australis - Australian Red Cedar	Pinus caribaea - Slash Pine
Cedrela odorata - Spanish Cedar	Podocarpus cupressina - Cypress Pine
Chamaecyparis lawsoniana	Samanea saman - Monkey Pod
Cinnamomum camphora - Camphor	Sequoia sempervirens - Redwood
Cryptomeria japonica - Sugi	Swietenia macrophylla - Large Leaf Mahogany
Cupressus lusitanica - Portuguese Cypress	Swietenia mahogani - Mahogany
Cupressus macrocarpa - Monterey Cypress	Tectona grandis - Teak
Eucalyptus citriodora - Lemon Gum	Thuja plicata - Western Red Cedar
Eucalyptus deglupta - Amamanit	

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