

Appendix F

Timeline of Forest History

Appendix F: Timeline of Forest History

This document was prepared by Ronald Cannarella, Forester with the Hawaii Division of Forestry and Wildlife during the process of developing Hawaii's Statewide Assessment of Forest Conditions and Resource Strategy in June 2010. This timeline grew organically; it was not intended to be a scholarly work for publication, and started out as an on-line collection of dates and events that would help me to understand the historical context of forest management in Hawaii. All of the information was compiled from public sources, many of them on-line web sites. I have included this timeline for the general interest of the reader. Please do not cite this document as a scholarly work.

There are two sections in this appendix. The first section is a chronological history of the land area of Hawaii and the events that have contributed to the present condition of our forests; particularly as it relates to the connection between healthy forests and water.

The second section is a report entitled "GENERAL DESCRIPTION OF THE HAWAIIAN FORESTS 1902" written by U.S. Forester E.M. Griffith on hawaiian forests and presented in Yokohama, Japan on March 5, 1902. The following year, in 1903, Hawaii hired its first Territorial Forester.

- 70,000,000 BP - A hot spot develops in the center of the Pacific tectonic plate, which initiates the development of what would eventually become known as the Hawaiian Islands - the most isolated island archipelago in the world. As the crust moves over the hot spot, a new volcanic island is formed. Wind, rain and oceanic waves immediately begin to act on/affect each new island. As the Pacific plate continues to move over the hot spot, the older islands are continually eroded until they no longer rise above sea level. For several millennia, the ancient islands maintain their existence as coral atolls. These atolls are known today (2010) as the Northwest Hawaiian Islands and as of 2009 are Federally protected - and the largest Marine Sanctuary in the world. More ancient atolls that continue to subside as the Pacific plate moves to the northwest become known as seamounts. Thus, an unbroken series of high volcanic islands from the Big Island of Hawaii to the Emperor seamounts serve as a series of transient but continuous landfalls for the terrestrial and marine organisms that comprise the endemic species found in Hawaii and nowhere else in the world.
- 34,000,000 BP - Corals first established on Midway Atoll, the oldest island in the Hawaiian archipelago (Paleoceanography of Coral Reefs in the Hawaiian-Emperor Chain Richard W. Grigg, Hawaii Institute of Marine Biology, University of Hawaii). www.sciencemag.org/cgi/content/abstract/240/4860/1737.
- 400-600 AD - First humans/Polynesians arrive in Hawaii, bringing with them new non-native species. Population centers develop first in the flat lowlands (wet and mesic areas) across the main Hawaiian Islands. With time, the lands are cleared and converted to agriculture. Practices such as burning to clear drier areas for agriculture take place to encourage growth of pili (*Heteropogon* spp.) grass for thatching. This starts the

conversion of lowland to dry-mesic forests to "taiga" predominantly grasslands.

- 600-1778 - Hawaii experiences its first wave of native species extinctions and significant impacts to ecosystems start to occur. The fossil record and pollen analysis indicate the extinction of many species of endemic native birds and the destruction of unique lowland forests, dominated by loulou palm (*Pritchardia*) occurred shortly after the first permanent settlements are established. Introduced animals, particularly seed-eating rats, dramatically change the regeneration dynamics of native vegetation, rendering some dominant species stressed/rare. After the arrival of the Polynesians, but prior to the arrival of the Europeans, the fossil record indicates the extinction of "at least seven species of Hawaiian geese (many of them flightless). Also, the extinction of two species of flightless ibises, a sea eagle, a small hawk, seven species of flightless rails, three species of owls belonging to an extinct genus, two large crows, one honey eater and at least 15 species of Hawaiian finches" [likely became extinct]. (S. Olson and H. James. *Science*. Vol. 217. 13 August 1982, p 633-635) and "First Wave Adaptations: The Ahupua`a System; blending technology" (fish ponds unique in Polynesia properly. Jared Diamond "Guns, Germs and Steel" W.W. Norton & Company, New York, New York, 1999, 1997), and the Kapu (off limits) System of religion and politics [codifying] social structure, land tenure behavior to develop a sustainable economy was implemented. Traditional land use practices are developed and the islands supported thriving sustainable population
- 1778 – The second Wave of Challenge: Impact of new culture, new economic system and the introduction of non-native invasive species occurred. The arrival of Captain Cook, first well-documented European, and contact occurred with native Hawaiians. Captain James Cook first introduced goats to Hawaii in 1778, leaving one ram goat and two ewes on Niihau Island, and on Kauai. (James Cook. *A Voyage to the Pacific Ocean. Undertaken by the Command of His Majesty, for Making Discoveries In the Northern Hemisphere*, 3rd ed. 3 vols.; London: G. Nicholl and T. Caddell, 1784), 2: 22425.) www.state.hi.us/dlnr/dofaw/pubs/history.html.
- 1790 - 1839 - Sandalwood harvesting begins, reaches peak from 1811- 1826. Sandalwood trade was the monopoly of Kamehameha I until his death in 1819. His successor, Liholiho (Kamehameha II) allowed other chiefs to profit from sandalwood, and by 1826 commoners were allowed to trade sandalwood. As a result, by 1845 the more accessible mesic and dry forests of Hawaii are virtually devoid of mature sandalwood trees. (8. St. John, "Sandalwood," 1920. For a summary of the sandalwood trade, see: Thomas R. Cox, "Sandalwood Trade," in *Historical Dictionary of Oceania*, Robert D. Craig and Frank P. King, eds. (Westport, Conn. Greenwood Press, 1981), 25859.)
- 1793 – Captain George Vancouver introduces cattle and sheep to Hawaii. Kamehameha I places a kapu (taboo) on them to encourage natural proliferation of goats, cattle and sheep for future generations.
- Other second Wave Impacts: Population of Native Hawaiian species (plants & animals)

plummets drastically due to introduced disease, loss of access to land and natural resources, introduced animals reproduce rapidly in the wild, producing abundant game, all at the expense of the forested lands/ecosystem integrity.

- More Second Wave Adaptations (three main components): 1) transformation of government (1795 - 1893) from island-states to Kingdom to Constitutional Monarchy), 2) transformation of religion (1819 `Ai Noa widespread practice of men and women eating together as an act of Civil Disobedience, 1820 first Christian missionaries arrive **uninvited**, 1831 formal ending of Kapu system and adoption of Christianity, 3) transformation of the land tenure system (1848).
- 1795-1810 - Kingdom of Hawaii established by King Kamehameha I, brilliant military strategist, charismatic leader and visionary statesman transforms fractious island chain into a modern nation state. "The unification ended the Ancient Hawaiian Society of the Hawaiian islands transforming it into an independent constitutional monarchy crafted in the tradition of European monarchies." copied and pasted from Wikipedia by Ron C April 9, 2010. Capital located at Lahaina, Maui. "Government in the Kingdom of Hawaii was transformed in phases, marked by the promulgation of the constitutions of 1840, 1852, 1864 and 1887. Each successive constitution reduced the power of the monarch in favor of an elected legislature increasingly dominated by the interests of those American and European descents." Directly copied from Wikipedia by Ron Cannarella on April 9, 2010.
- Third Challenge/Wave of change - the water crisis of the 19th century. Likely caused by massive deforestation, waves of epidemics devastating native Hawaiian populations, and Hawaii was brought into the global economy - adopts unsustainable land stewardship practices/loses sight of centuries of enlightened cultures that were in tune with sustainable land management.
- 1809 - John Palmer Parker, a sailor from Massachusetts arrives on the islands. He marries the Hawaiian chiefess "Kipikane" in 1816 and begins the Parker Dynasty, which domesticated wild cattle and horses that freely roamed the Big Island.
- 1819 - Kamehameha I dies.
- 1819 - the first whaling ships visit Hawaii in the fall. Between 1824 and 1861, whaling ships arrive at ports in Hawaiian ports a total of 10,340 times, (Korte, A Brief History of Forest Destruction" 1961 Unpublished Manuscript).
- 1820 - First Christian missionaries come to Hawaii.
- 1826 - Mosquitos, vectors of bird malaria, are introduced to Hawaii by the SS Wellington, in Lahaina Harbor. As mosquitoes spread, and introduced birds are brought to Hawaii, and dramatic declines of native birds are seen in the lowlands during the remainder of the 1800's and into the 20th century.

- 1830 - Kapu lifted on slaughter of wild cattle and goats due to large population. (hawaii.gov/hdoa/ag-resources/history).
- 1831 - Queen Kaahumanu, wife of King Kamehameha I and father of Liholiho (Kamehameha II) formally abolishes ancient Kapu System and establishes Christianity as the official State Religion of the Kingdom, stating. "Worshipping of idols such as sticks, stones, sharks, dead bones, ancient gods and all untrue gods is prohibited. There is one God alone, Jehovah. He is the God to worship. The hula is forbidden, the chant (olioli), the song of pleasure (mele), foul speech, and bathing by women in public places. The planting of awa (or kava, a mildly narcotic drink prepared from the root of Piper methysticum) is prohibited. Neither chiefs nor commoners are to drink awa." (Kamakau, 1992, p. 298-301).
- 1839 - First forestry law passed in Kingdom of Hawaii restricting cutting of sandalwood, but only few remnant individual trees remain. (9. Ralph S. Kuykendall, *The Hawaiian Kingdom*, (3 vols.; Honolulu: University of Hawaii Press, 1938-67) 1: 85-95; Theodore Morgan, *Hawaii: A Century of Economic Change, 177B-1876* (Cambridge, Mass.: Harvard University Press, 1948), 61-68; Edward Y. Hosaka, "History of the Hawaiian Forest" (typescript; Honolulu: University of Hawaii, 1931).
- 1846 - King Kamehameha III passes a law declaring forests to be government property. (hawaii.gov/hdoa/ag-resources/history).
- 1848 - First public distribution of water taken from Nuuanu Stream to residents of Honolulu.
- 1848 - King Kamehameha III "Great Mahele" abolishes the traditional land tenure system of the Hawaiian Kingdom, and institutes a new system of land ownership. Roughly 1/3 of the lands in the Kingdom were reserved for the Government, one third reserved for the Crown, and one third made "fee simple" with the intent that the lands would be granted to individuals for their own use. The now privatized fee simple lands could then be bought or sold.
- "In 1846 the lately created right of private ownership of land in fee and the sudden creation of what at that time seemed to be an inexhaustible supply of available government land combined to inaugurate a selling spree. From September, 1846, to December 31, 1857, the sale of government lands totaled 162,013.51 acres." . . . "Conclusions: The factual history of the public domain of Hawaii admits of the following conclusion: (1) the public domain has been sacrificed to avidity and political expediency; (2) conservation has been notably absent in the administration of land laws." (1946 Report of the Land Laws Revision Commission).
- 1850 - Botanists recognize damage to Hawaiian forests, call for control of feral animals (7. E. Bailey, "Report on Trees and Grasses," *Transactions of the Royal Hawaiian Agricultural Society*, 1 (1851): 80 [quotation]; Edward Y. Hosaka, "[The Problems of Forestry and the Work in Progress toward Reforestation in the Territory of Hawaii](#)"

(unpub. thesis, University of Hawaii, 1930).

- 1850 - Commercial Timber Milling begins on Maui, but the industry never develops due to availability of cheaper, better quality lumber products from Pacific Northwest. (10. Hosaka, "History," 10; T. Metcalf, "Report on Saw Mills," Transactions of the Royal Hawaiian Agricultural Society, 2 (1854): 14445 (quotation).
- 1859 - Hawaiian Kingdom legislature passes "An Act to Authorize the Minister of the Interior to Take Possession of Whatever Land and Water may be required for use of the Honolulu Water Works". This act marks the first time the government asserts ownership and direct responsibility over the management of water resources (Cox, 1992 as quoted in Derrickson, et al "Watershed Management and Policy in Hawaii: Coming Full Circle")
- 1870 - Horace Mann writes the comprehensive book "Flora of the Hawaiian Islands," spurring interest in the natural history of the Hawaiian Islands. (12. Sanford B. Dole to [Minister of Interior?], April 25, 1870, Hawaii, Interior Dept., Misc. files: Agriculture and Forestry [hereafter AF], 1860-1876 correspondence (Hawaiian State Archives, Honolulu). Dole had a deep interest in natural history. He had published A Synopsis of Birds of the Hawaiian Islands in 1869.)
- 1870 - First plantings of Eucalyptus spp. on Maui.
- 1876 - Hawaii legislature passes "An Act for the Protection and Preservation of Woods and Forests" in response to water crisis in Honolulu due to deforestation and decrease in stream flow Nu'uuanu Stream, the main source of water for Honolulu. The Act authorizes the creation of forest reserves, and establishes the position of "Superintendent of Woods and Forests" to manage the forest reserves. The preamble to the Act stated: "Whereas, it is an established fact that the destruction of forests in any country tends to diminish the supply of water..."
- 1876 - The Reciprocity Treaty between Kingdom of Hawaii and the United States of America allows for the duty-free importation of sugar into the USA. The growing and manufacture of sugar becomes the dominant industry in Hawaii for the next 100 years.
- 1880 - Hawaii legislature passes a law to protect from trespass by domestic animals all watershed areas contributing to domestic water supplies.
- 1880 - Minister of the Interior's annual report to the legislature states "Let all the mauka lands be kapu, let the forests be protected, and not only protected, but have planted trees over the whole of our mauka lands..."
- 1882 - First government tree nursery established to provide tree seedlings for reforestation of mauka lands above Honolulu. 50,000 tree seedlings are planted on the denuded slopes of Tantalus (Honolulu). (Cox from Derrickson).

- 188? (exact date unknown) - "A great fire occurred in Kula that burnt for weeks" (Korte, Forest Reserves of Hawaii Series, #2).
- 1884 - Jim Kukona hired as Hawaii's first forest ranger for the protection of government forest lands from Manoa to Kalihi.
- 1876 – 1910 - Government and agricultural sectors recognize importance of Hawaiian forests in providing water for urban consumption and irrigation of sugar cane. Forested areas are fenced, cattle removed, and trees are planted but efforts are undertaken on an individual basis and not coordinated. Large numbers of non-native species are introduced in effort to identify best species for establishing forest cover. Honolulu experiences many droughts, water related epidemics and two catastrophic urban fires underscoring the need for increased, safe and reliable public water supply.
- 1889 - The first artesian well in the Hawaiian islands is drilled by Cattle Rancher James Campbell in Ewa, Oahu, ushering in the use of groundwater for irrigation and human consumption. (hawaii.gov/hdoa/ag-resources/history).
- 1889 - Bishop Museum is built by Charles Reed Bishop, a Hawaiian philanthropist and co-founder of Kamehameha Schools and First Hawaiian Bank, in memory of his late wife Bernice Pauahi Bishop. The museum grows to become the largest repository of Hawaiian cultural and biological
- 1892 - Legislature passed three bills (1) To Create The Bureau of Agriculture and Forestry under the Minister of Interior. (2) An Act was passed making it unlawful to cut or to destroy any forest tree or shrubbery within 250 feet of any road through a natural forest. (3) It was provided that forest lands be exempt from taxation under certain conditions.
- 1892 - Bureau of Agriculture and Forestry immediately implements a program to control or eliminate wild goats and cattle and several forest reserves are created (Walker, Ronald "A History of the Division of Fish and Game, April 1978).
- 1893 - The Monarchy was abolished and succeeded by the Provisional Government under an executive council.
- 1894 - Republic of Hawaii is proclaimed.
- 1894 - Joseph Marsden, Commissioner of Agriculture and Forestry, reports to the Minister of Interior that the combined effect of drought and indiscriminate pasturing of cattle in the Hamakua and Kohala Districts on the island of Hawaii had dried up important water holes and springs and that in some cases matters had become so critical that water had to be shipped from Honolulu in barrels.
- 1895 Hawaii Sugar Planter's Association (HSPA) formed with the goal of promoting research and development of the sugar industry. HSPA becomes active in water

management and the establishment of the forest reserves.

- 1898 Republic of Hawaii is annexed by the United States. 1.75 million acres of land still classified as Government and Crown in the Great Mahele are ceded to the United States, and are henceforth referred to as the "Ceded Lands".
- 1900 - The Hawaii Organic Act is passed on April 30, 1900, and officially establishes the Territory of Hawaii. Ownership of the Ceded Lands is transferred to the US Federal Government, and administrative control and use of the lands is granted to the government of the Territory of Hawaii.
- 1898-1959 -Federal Government retains 373,719 acres of Ceded Lands; 227,972 acres of those lands are set aside as Volcanoes National Park and Haleakala National Park. The remainder are reserved mainly for military use (US Army Schofield Barracks on Oahu, Pearl Harbor Naval Base on Oahu, Marine Corps Base on Oahu, Hickham Air Force Base on Oahu and the entire island of Kahoolawe). (Native Hawaiian Rights Handbook p 26-30.)
- In an important article of September, 1899 Mr. Walter Maxwell, agriculturist of the H.S.P.A., urged that there be a thorough, expert examination to determine the Islands' "requirements in permanent forest areas." (Source ("The Conservation, Development and Protection of the Water Resources of the Honolulu Urban Area."))
- 1900 - A wildland fire in the Hamakua district of the island of Hawaii burns an area 15 miles long and 2 miles wide (Korte, Forest Reserves of Hawaii Series, #2)
- 1900 - "Albert Koebele, Entomologist of the Board of Agriculture and Forestry wrote: "The greatest enemies of the beautiful Hawaiian forests, the worst and most destructive ever introduced among tropical forests are cattle, which will sooner or later, but positively and entirely destroy the forests. I doubt that anything else in nature, axe and fire included, would have in the same space of time brought the once densely clothed islands to the present condition." (Korte, "A Brief History of Forest Destruction", p.1).
- 1902 "GENERAL DRIPTION OF THE HAWAIIAN FORESTS" documents 3 key issues; 1) most important ecosystem service of Hawaiian forests is water, 2) destruction of Hawaiian forests by feral ungulates, and 3) wildfire, previously unknown in forested ecosystems, rapidly converting forested ecosystems to fire-dominated ecosystems. Prepared by U.S. Forester E.M. Griffith for Governor Sanford Dole, in a Paper Presented at Yokohama, Japan, on March 5, 1902 (www.state.hi.us/dlnr/dofaw/wmp/griffith.htm).
- 1902 - Gifford Pinchot renowned head of the U.S. Forestry Department, makes a personal inspection of Nu'uau and Tantalus forests.
- 1903 - Hawaii Territorial Legislature passes Act 44 establishing the Board of Agriculture and Forestry, predating the USDA Forest Service by one year. Act 44

expands on the Forestry Act of 1876 and provides the legal vehicle for the creation of reserves encompassing private as well as public lands. In 1903 the Legislature passed a comprehensive forestry law. The Department of Agriculture and Forestry was reorganized under a Board of Commissioners of Agriculture and Forestry whose specific duties included (and still include) the custody, control, and regulation of all land set aside as forest reserves; also, "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" and to make recommendations to the Legislature from time to time with respect to desirable additional legislation. However, the Territory of Hawaii does not have sufficient funds to pay for fencing and cattle removal as provided for in Act 44.

- 1903 Forester William L. Hall of the US Department of Forestry is sent by Washington DC to Hawaii to assess condition of Hawaii's forests. Hall recommends sending Frank S. Hosmer to Hawaii.
- 1904 Frank Hosmer hired as first Territorial Forester and immediately begins the creation of first forest reserves to protect upper watershed areas. Forest reserves managed by fencing, feral animal elimination, and reforestation with native and exotic tree species.
- 1907 Hunting License system established and 35 District foresters were commissioned as "Special Territorial Police Officers". (Walker, Ronald "A History of the Division of Fish and Game, April 1978).
- 1904 - 1914 First Territorial Forester Frank S Hosmer establishes Hawaii's Forest Reserve System on Oahu, Kauai, Maui, Molokai, and Big Island on private and public land. The primary function of the Forest Reserve System is to protect Hawaii's watersheds to assure dependable supplies of water on all islands. The forestry policy and programs started in 1904 were substantially sustained for more than 50 years.
- 1907 - Frank Hosmer distinguishes two types of forests in Hawaii; 1) protection forests, those on the wet windward slopes, the most important product of which was water, and 2) commercial forests, the most important product of which was wood. Commercial forests, having no springs or surface streams, were considered nonessential with regard to water. The only large area of commercial forest was on the leeward side of the Big Island of Hawaii. (Woodcock)
- 1904 - 1938 Many people key to forestry efforts in Hawaii, including Hosmer, Rock, Judd, and Lyon, import and conduct planting trials for hundreds of species of plants and trees. Many of these species prove useful [and} many turn out to be detrimental due to their ability to replace native species.
- 1908 - Governor Frear attends the "Governor's Conference in Conservation" in Washington, DC. As a result, USGS begins operations in the Territory of Hawaii to

assist with watershed protection and research on the extent and characteristics of Hawaii's groundwater resources.

- 1908 - Governor Frear appoints a "Territorial Conservation Commission of Hawaii" which was to investigate the natural resources of the Territory and recommend wise development and use. This is the beginning of a true conservation program in the Islands(Walker, Ronald "A History of the Division of Fish and Game, April 1978).
- 1909 - Legislature enacts a special income tax, designated a "Conservation Tax," the purpose of which was "to promote the conservation and development of the natural resources of the Territory. With certain amendments the law remained in effect until 1915 when it was merged with the general income tax.
- 1910 - Completed construction of The Hamakua Ditch. The ditch was originally designed to transport sugar cane, rather than irrigate it. The 25-mile-long system tapped verdant Waipio Valley's springs and streams and flumed (floated) hand-cut sugar-cane stalks from upper fields to processing plants along the Hamakua Coast. As sugar production became more mechanized over the years, the water was used to wash the plants at the mills before eventually irrigating approximately 6,000 of the Hamakua Sugar Co.'s 21,400 acres of sugar cane. When the plantation closed, the ditch, which had been neglected for several years, was a decrepit mess and experienced a series of calamitous failures. Able to transport as much 40 million gallons of water a day in its heyday, the ditch was collecting just 8 million gallons a day (MGD) with only 2 MGD actually making it through the system, a 75 percent loss rate. (www.hawaiibusiness.com/Hawaii-Business/November-2005/The-Coast-Is-Clear/), accessed April 25, 2010).
- 1904-1926 - Support for Hawaiian forestry from US Forest Service is sporadic.
- 1912 – The population of Honolulu was 50,183. The Sanitary Commission recommends "...if we are to profit by the experience of the past, we ought to plan for nearer 500,000 people than simply to provide for the present needs." ("The Conservation, Development and Protection of the Water Resources of the Honolulu Urban Area.")
- 1912 – “The Outdoor Circle” was created, a civic organization dedicated to "keeping Hawaii clean, green and beautiful by preserving, protecting and enhancing our environment for future generations.
- 1913-1968 - Construction of the Waiahole Ditch irrigation system completed. The ditch transported almost 30 mgd of fresh water from rainy Windward Oahu, through the Ko’olau Mountain Range, to the parched Leeward side of the island and its thirsty sugar cane fields. The diversion of the water fueled the Islands’ economy and shaped Oahu’s development for nearly 80 years.
- 1915 - "General feeling of alarm and crisis was reported with respect to the poor water

situation in Honolulu."

- In a paper dated May 10, 1915 - which has become recognized as one of the principal contributions to present knowledge, Dr. Arthur Alexander, prominent local civil engineer, recommended that the government acquire "all private rights to the water from the valleys back of Honolulu" also, "the control of the entire artesian supply underlying Honolulu."
- 1916 - Hawaii Volcanoes National Park established.
- 1917 - Act 217 passed, protecting bird, animal and vegetable life on several islands off Oahu and Molokai and gave the responsibility to the Division of Forestry. Thus began the system of wildlife sanctuaries and refuges we have today.
- 1918 - The Hawaiian Sugar Planters Association adds a Department of Forestry to their Experiment Station.
- 1918 – W.M. Giffard writes "(For Honolulu) water itself, as well as the forest that clothes the catchment areas, must be conserved, and what is more, action must be taken at once. The people of this island face a serious condition, one that can no longer brook delay".
- 1919 - "The Fish and Game Commission" was established under the Board of Agriculture and Forestry. However, hunting and fishing laws were almost non-existent with no seasons, bag limits or other restrictions. (Walker, Ronald "A History of the Division of Fish and Game, April 1978).
- 1923 - Surface water no longer supplied to Honolulu residents. All municipal water supplies pumped from artesian wells.
- 1923 - First quantitative report on potential water supplies for Honolulu is produced.
- Mr. C. S. Judd's report to the Forestry Board for the biennium 1923-1924 renewed his recommendation that, whenever the owners of private lands within the forest reserves are found to be uncooperative in the protection of forests, "the way should be cleared by legislative action for the government to acquire their lands." Mr. Judd listed 18,390 acres of this class, none of which were in Honolulu.
- 1926 - Financial assistance is extended to the Territory by the Forest Service to support production of tree seedlings for reforestation under authorization by the Federal Clarke-McNary Act of 1924. (Nelson, Robert E. 1989. The USDA Forest Service in Hawaii: The First 20 Years (1957-1977). USDA Forest Service General Technical Report PSW-111.
- 1927 - The Division of Fish and Game is established under the Board of Agriculture and Forestry. The mission then was to provide law enforcement, expand the

importation program for shellfish and fish, develop the game farm to increase game bird distribution and experiment with mullet production at the Mokapu facility. (Walker, Ronald "A History of the Division of Fish and Game, April 1978).

- 1928 - First Nene (native Goose) restoration project by State Senator Robert Hind. (Walker, Ronald "A History of the Division of Fish and Game, April 1978).
- 1929 - "The conservation of this most valuable asset (ground water) should be the prime consideration of each and every citizen of the community." Report of W.M. Chaffe, Honolulu Board of Water Supply. (Conservation, Development and Protection Report, Vol. p. II-62).
- 1930 - Forest Reserve System in Hawaii includes 1,000,000 acres, roughly one quarter of the land area of the Territory.
- 1931 - Additional Federal financial assistance is extended to Hawaii to support forest fire protection activities. ((Nelson, Robert E. 1989. The USDA Forest Service in Hawaii: The First 20 Years (1957-1977). USDA Forest Service General Technical Report PSW-111.
- 1932 - In his report to the Board of Water Supply for the years 1931 and 1932 Mr. Ohrt, the Manager and Chief Engineer of the Honolulu Board of Water Supply states that "he felt, for the first time, that the problem of Honolulu's water supply could be said to have been solved." (Conservation , Development and Protection Report, Vol. p. II-65)
- 1933 - Due to the Great Depression most of the paid staff in forestry had been laid off. However, 500 men hired by the Civilian Conservation Corps (CCC) begin emergency conservation work in the forest reserves.
- 1935 - 1940 number of workers in the CCC rises to 1,200. These men laid trails, built fences, shot animals, and planted 1.2 million trees in Forest Reserves throughout the Territory (Woodcock).
- 1938 - Boundaries of the Honolulu Forest Reserve are moved makai (seaward) in the valleys of Kalihi, Nuuanu, Makiki and Manoa.
- 1948 - Report "The Conservation, Development and Protection of the Water Resources of the Honolulu Urban Area" (Large PDF files Volume 1, and Volume 2).
- 1954 - Territory of Hawaii creates the State Park System.
- 1957 - Territorial legislature passes three major pieces of legislation regarding land use planning. The first establishes a Land Study Bureau to describe all lands as a basis for determining their best uses. The second establishes Forest and Water Reserve zones regulated and administered by the Territory. The third establishes the Territorial

Planning Office (later the State Office of Planning) to prepare a long-range comprehensive plan to guide physical and economic development.

- 1957 - Eugene V. Roberts examines the forestry situation in the islands at the request of the Board of Agriculture. His report recommends implementing a program including a forest inventory, wood, utilization research, silviculture and related research, and watershed research. Subsequently, and encouraged by the Territorial legislation, the Forest Service and Territorial officials developed specific proposals for the desired programs. (Nelson, Robert E. 1989. The USDA Forest Service in Hawaii: The First 20 Years (1957-1977). USDA Forest Service General Technical Report PSW-111.)
- 1957 - USDA Forest Service experiment station established for forestry research in Hawaii; eventually becomes the Institute of Pacific Islands Forestry.
- 1950's - value of forest products in Hawaii is \$2 million, the value of sugar and pineapple industries output was approaching \$200 million annually; defense expenditures \$400 million. (Nelson, Robert E. 1989. The USDA Forest Service in Hawaii: The First 20 Years (1957-1977). USDA Forest Service General Technical Report PSW-111).
- 1957-1977 - Robert Nelson serves as Director of the USDA Forest Service Institute of Pacific Islands Forestry located in Honolulu.
- 1957 - Forest Resource Inventory begins and the resulting report "Publication of the Report Forest Resources of Hawaii -1961."
- 1959 - "Hawaii Timber Production Conference" is held and evolves into an annual forestry conference for the next 18 years (check this number).
- 1960 the Department of Agriculture and Forestry was reorganized and re-titled Department of Agriculture and Conservation.
- 1960 - Second annual forestry conference is organized jointly by the Honolulu Chamber of Commerce and the Hawaii Department of Agriculture and Conservation. The result was the report "A Wildland Research Plan For Hawaii" published by the Department of Agriculture and Conservation.
- 1961 - Hawaii State Land Use Law (Act 187, also called "The Greenbelt Law") is passed by the legislature. All lands in the state regardless of ownership are classified in one of three zones; The Conservation Zone, The Agricultural Zone and The Urban Zone. The boundaries of the Conservation Zone are based largely on the original Forest Reserve boundaries. The Department of Land and Natural Resources is assigned regulatory authority over lands in the Conservation Zone. State-owned lands in the Conservation Zone become the new Forest Reserves. (A fourth zone, The Rural Zone is added in 1963 (reference State of Hawaii Land Use Districts and Regulations Review).

- 1961 - Hawaii State Legislature passes The Groundwater Use Act giving the State Board of Land and Natural Resources (BLNR) broad powers and responsibilities to oversee, manage, and control all ground water uses statewide, including the authority "to regulate the use of ground water in areas designated by the board as being endangered or likely to become endangered by excessive or improper use."
- 1961 - The Division of Forestry is transferred to the Department of Land and Natural Resources (a reorganized agency that had been the Department of Public Lands).
- 1961 - Hawaii Forest Resource Inventory, a major project, is completed and a report published in 1963.
- 1962 - Forest Service Program is 1) Plan and accomplish an inventory of the forest resources (high-lighting timber potentials) of the Hawaiian Islands, in cooperation with the Hawaii 1957 Division of Forestry, 2) Provide (or help obtain) technical assistance to the Territory on forestry matters as occasions demanded, 3) Represent the State and Private Branch of the Forest Service in the Federal cooperative assistance programs with the Hawaii Division of Forestry, and 4) determine the need for research in the various aspects of forestry, and recommend, plan, and lead a broad program of research in cooperation with the Hawaii Division of Forestry and other agencies in the islands. (Nelson, Robert E. 1989. The USDA Forest Service in Hawaii: The First 20 Years (1957-1977). USDA Forest Service General Technical Report PSW-111).
- 1962 - First comprehensive statewide forestry plan State Division of Forestry and Institute of Pacific Islands forestry releases first modern era forest planning document "Multiple Use Program for the State Forest Lands of Hawaii". The program is built around multiple use policy for the management and development of the renewable natural resources--water, timber, forage, recreation, and wildlife habitat--of State-owned forest lands. In addition it points the way for promoting forestry practices on private forest lands.
- 1962 - Report "A Program for Watershed Management Research in Hawaii Wildlands." (large PDF).
- 1961-1968 - Plantations of potential commercial timber species established in Waiakea forest reserve and Laupahoehoe forest reserve on the island of Hawaii.
- 1961 - Haleakala National Park on the island of Maui re-designated as a separate entity (formerly part of Volcanoes National Park, Island of Hawaii).
- 1963 - (updated in 1965) Legislative Reference Bureau publishes "Public Land Policy in Hawaii: The Multiple-Use Approach."
- 1964 the Board of Land and Natural Resources officially sets aside 9,939 acres of land on the Island of Kauai as the "Alakai Wilderness Preserve" for the expressed purpose to conserve native Hawaiian ecosystems.

- 1965 – 1972 - Major environmental laws enacted by Federal government, including The Clean Water Act, The Endangered Species Preservation Act (1966) Coastal Zone Management Act and the National Environmental Protection Act, placing many layers of regulatory controls and multiple agency jurisdictions on the use of land and water resources. Grants provided by the Federal government via these programs have a significant impact on policy and programs of the Division of Forestry and Wildlife. State agencies begin to work cooperatively with their Federal counterpart.
- 1969 - Hawaii is the first state to establish its own system requiring environmental impact statements when it passes the Hawaii Environmental Protection Act (HEPA). The preamble to HEPA states "The legislature finds that the quality of humanity's environment is critical to humanity's well being, that humanity's activities have broad and profound effects upon the interrelations of all components of the environment, and that an environmental review process will integrate the review of environmental concerns with existing planning processes of the State and counties and alert decision makers to significant environmental effects which may result from the implementation of certain actions."
- 1969 - State of Hawaii Land Use Districts and Regulations Review prepared for the State Land Use Commission (209 pages, extremely detailed and thorough document).
- 1970 - Legislature establishes the Hawaii Natural Area Reserve System (NARS).
- 1970 - Hawaii passes its own Environmental Protection Act (Act 132, Session Laws of Hawaii 1970 codified as, HRS Chapter 341). The Act creates the Office of Environmental Quality Control; The Environmental Center (Univ. of Hawaii); and the Environmental Council.
- 1970 – 1990 - Jurisdiction over water use, water quality and watershed management is fragmented among federal, state, and county agencies (Derrickson).
- 1971 - Forest Conservation Research Plan for the 70's is produced by DOFAW.
- 1973 - A Plan for Hawaii's Environment: A Report by the Temporary Commission on Statewide Environmental Planning prepared at request of Hawaii legislature. Addresses issue of "carrying capacity", and contains 200 suggested environmental policies and proposed amendments to 1970 Hawaii EPA Act HRS 341).
- 1973 Federal Endangered Species Act is passed. Hawaii contains nearly 30% of the federally listed Threatened & Endangered Species in the country.
- 1973 - The state Supreme Court rules in McBryde vs. Robinson, saying private entities have rights to use surplus water, but the state is the actual water owner. (from PDF History of Water in Hawaii by Ramsay Taum, Feb 16, 2006. www.wrrc.hawaii.edu/seminars/Wai-6perpage.pdf, Source: (www.hawaiiibusiness.com/Hawaii-Business/April-2003/Hawaiis-H20-History/).

- 1974 - USDA Agricultural Stabilization and Conservation Service publishes Hawaii Rural Environmental Conservation Program State Program Handbook
- 1975 - Second comprehensive statewide forestry plan "A Program for the State Forest Lands of Hawaii 1975" At that time, only two Natural Area Reserves had been established; the 1949 Lava Flow (Island of Hawaii) and Ahihi-Kinau (Maui).
- 1976 - Hawaii Water Resources Regional Study Completed (multiple volumes).
- 1978 - The Hawaii State Plan passed by Legislature to provide a long range guide to influence the direction, rate, and timing of growth in the State signaling a policy of "growth management" in Hawaii's public policy (Derrickson). Focus of DOFAW gradually shifts towards the protection of endangered species and away from commercial forestry.
- 1978 - Constitutional Convention establishes a new water resources agency (State Water Commission) whose role was to protect, manage, and regulate water resources. The Con-Con also passed landmark amendments that constitutionally reaffirmed native Hawaiian traditional and customary practices.
- 1980 - The Nature Conservancy opens Hawaii office, although they have been active in biodiversity planning since the 1960s. The Hawaiian Forest Bird Campaign (1981-83) was the first land acquisition campaign of the Hawaii Office, and used recently completed comprehensive endemic forest bird surveys on all islands to identify high priority areas for acquisition.
- 1981- Working Conference on Forestry and Related Natural Resources of Hawaii, a two-day workshop, is produced by The University of Hawaii College of Tropical Agriculture and Human Resources (CTAHR). The resulting Final Report and Action Plan identify and prioritize issues and bottlenecks for managing ecosystem services provided by Hawaii's forests.
- 1985 - Third comprehensive statewide forestry plan "Hawaii Renewable Resources Research Plan for the Eighties."
- 1988 - Threatened and Endangered Species Plan for Wildlife, Plants and Invertebrates released by DLNR Division of Forestry and Wildlife.
- 1986 – Multi-resource Inventory of Oahu, Multi-resource Forest Inventory for Kauai and Multi-resource Forest Inventory for Molokai Completed (published in 1988).
- 1987 - The Hawaii Legislature adopts the State Water Code. The code establishes the state Commission on Water Resource Management (CWRM). (Source; PDF History of Water in Hawaii by Ramsay Taum, Feb 16, 2006; accessed 4/25/090 www.wrrc.hawaii.edu/seminars/Wai-6perpage.pdf (www.hawaiiibusiness.com/Hawaii-Business/April-2003/Hawaiis-H20-History/).

- 1989 - Hawaii Forest Industry Association founded to promote a balance of forest land uses, to represent forest industry and provide training information education and advocacy for Hawaii's \$29 million annual forest industry.
- 1987 - Enactment of the State Water Code sets precedence on the allocation of water with the shutdown of a plantation irrigation system. (hawaii.gov/hdoa/ag-resources/history).
- 1990 - The CWRM adopts the Hawaii Water Plan (HWP) for planning and resource management. (Source; PDF History of Water in Hawaii by Ramsay Taum, Feb 16, 2006). www.wrrc.hawaii.edu/seminars/Wai-6perpage.pdf =
- 1990's to 2010 - Sugar plantations close, and water usage drops dramatically.(Source; PDF History of Water in Hawaii by Ramsay Taum, Feb 16, 2006; (www.wrrc.hawaii.edu/seminars/Wai6perpage.pdf)(www.hawaiibusiness.com/Hawaii-Business/April-2003/Hawaiis-H20-History/).
- 1991 - First voluntary Watershed Partnership is established on East Maui with 7 partners and 4 associated partners, and encompasses 100,000 acres.
- 1991 – 2007 - Watershed Partnerships consisting of public and private lands are established on all major Hawaiian islands. By 2007, 1.6 million acres from nine watersheds are operating.
- 1992 - Hawaii Tropical Forest Recovery Act passed by Congress.
- 1994 - Fourth comprehensive statewide forestry plan "Hawaii Tropical Forestry Action Plan", (plus Appendices 1 and 2) are completed. Tropical Forestry Action Plan advocates for expansion of forest industry and establishment of Experimental Forest for Hawaii. The Hawaii Forest Industry maintains an excellent website for accessing the concepts, recommendations and action items in the Hawaii Tropical Forestry Action Plan.
- 1994 - Congressional Office of Technology Assessment releases a study documenting that five new plant species per year became established in Hawaii during the 20th century. For the 50-year period from 1937 to 1987, the Islands received an average of 18 new insects and other species annually; more than a million times the natural rate and almost twice the number absorbed each year by all of North America.
- 1994 - Hamakua Sugar Co. harvests last crop (September 30). www.hawaiibusiness.com/Hawaii-Business/April-2004/Unwanted-Dead-Or-Alive/. Accessed April 25, 2010.
- 1994 - Hawaii Forest Investment Memorandum is prepared by DLNR and Consulting Firm Groom Poyry and released by Dept. Business Economic Development and Tourism (DBEDT); released in an effort to stimulate investment in commercial forestry

in Hawaii.

- 1994 -1998 - (exact date unknown) Hawaii Forestry and Communities Initiative (HFCI) implemented with numerous projects, including inventory of commercial forestry resources, training, active recruitment of investors for forest industry.
- 1997 - Private, commercial eucalyptus plantations begin on former cane lands in Hamakua, Hawaii Island.
- 1998 - The Nature Conservancy completes the Hawaiian High Islands Ecoregional Plan.
- 1998 - Summary of Financial and Technical Assistance Programs for the Conservation of Natural Resources is produced for Hawaii Office of Planning. Comprehensive review of programs, laws, statutes and regulations relevant to natural resource conservation in Hawaii.
- 2000 - The Hawaii Supreme Court upholds CWRM's power to protect streams and traditional water rights in the Waiahole Ditch case (page 22). The court remands the case back to CWRM, with questions. (source; PDF History of Water in Hawaii by Ramsay Taum, Feb 16, 2006. www.wrrc.hawaii.edu/seminars/Wai-6perpage.pdf(<http://www.hawaiibusiness.com/Hawaii-Business/April-2003/Hawaiis-H20-History/>))
- 2002 - The Waiahole-Waikane communities, Hawaii's Thousand Friends and Kamehameha Schools appeal CWRM's final ruling, dividing Windward and Leeward water. The appeal is before the Hawaii Supreme Court. Kamehameha Schools (the second largest landowner after the state of Hawaii) withdraws a request to use 4.2 million gallons of Waiahole water daily on the Leeward side, citing its new strategic plan. (source; PDF History of Water in Hawaii by Ramsay Taum, Feb 16, 2006; www.wrrc.hawaii.edu/seminars/Wai-6perpage.pdf(<http://www.hawaiibusiness.com/Hawaii-Business/April-2003/Hawaiis-H20-History/>)).
- 2003 - The Hawaii Forest Institute is incorporated as a 501(c)(3) nonprofit organization to promote awareness of the intrinsic value of Hawaii's forests to the local and international community.
- 2003 - Hawaii Association of Watershed Partnerships (HAWP) is established. The Hawaii Association of Watershed Partnerships (HAWP) is comprised of nine Watershed Partnerships on six islands. Watershed Partnerships are voluntary alliances of public and private landowners and other partners working collaboratively to protect forested watersheds for water recharge, conservation, and other ecosystem services. HAWP seeks to increase the management and protection of such areas by raising the capacity of Watershed Partnerships, facilitating the sharing of watershed management knowledge, building public support and awareness of watershed values, and developing

sustainable funding sources.

- 2004 - The Hawaii Supreme Court issues its opinion In the Matter of Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments, and Petitions for Water Reservations for the Waihole Ditch Combined Contested Case Hearing (www.state.hi.us/dlnr/cwrm/current/waiahole/24873.pdf).
- 2006 - Hawaii Gap Analysis Project (GAP) completed, resulting in detailed landcover maps, stewardship maps and analysis of gaps in lands required for the conservation of native species.
- 2006 - Office of Planning releases Report on Urban Lands in the State of Hawaii projecting the future needs for urban land expansion in Hawaii.
- 2006 - The Hawaii Conservation Alliance is formed, establishing a cooperative partnership of 15 government, education and non-profit organizations that are strongly committed to environmental conservation in the Hawaiian Islands through land management, scholarly research and financial incentives. The Hawaii Conservation Alliance is dedicated to promoting effective, long-term management of Hawaii's native ecosystems through collaborative research, training and outreach among land managers, scientists, educators and the general public. Currently, the HCA member organizations are University of Hawaii at Manoa, U.S. Department of Agriculture (The Natural Resources Conservation Service, and The US Forest Service), The National Park Service, The Hawaii Department of Land and Natural Resources (Division of Aquatic Resources and Division of Forestry and Wildlife), Kamehameha Schools, National Oceanic and Atmospheric Administration, The National Marine Fisheries Service, Pacific Islands Regional Office, The National Marine Sanctuaries, The U.S. Fish and Wildlife Service-Ecological Services and National Wildlife Refuge Complex, The U.S. Geological Survey, The Office of Hawaiian Affairs, The Nature Conservancy, and the U.S. Army Garrison Hawaii Natural Resource Program. These groups and organizations supervise and maintain over 80% of Hawaii's indigenous terrestrial ecosystems and 100% of Hawaii's marine reserves.
- Hawaii - 2050 Sustainability Plan is produced at the request of the Hawaii Legislature.
- June 2008 - Farm Bill requires that all States, Territories and Freely-Associated States produce a comprehensive analysis of forest conditions and trends; "Statewide Assessment of Forest Conditions and Resource Strategy" (SWARS) and submit the documents to the Secretary of Agriculture within two years (due June 18, 2010) in order to qualify for Farm Bill funds in a variety of competitive grant programs.