

Plans drawn for majestic Mauna Kea

"Mauna Kea was important to the early Hawaiians. There they quarried its rock, and there lived Pōhaku, their Goddess of Snow, rival to Pele. Today, Mauna Kea remains important, although the reasons differ."

—Northeast Hawaii Community Development Plan
County of Hawaii

The importance of Mauna Kea as an international astronomical research center was at no time brought into a clearer focus than when a flurry of dedications of observatory projects took place on top of the lofty mountain last summer and early fall. With six observatories atop the 13,976-foot summit, and with the possibilities of more observatories to come, Mauna Kea now can unqualifiedly claim its world leadership in astronomical studies.

But Mauna Kea means more to the Big Islanders than a haven for professional star gazers to explore man's last frontier, the universe. It is a natural beauty, it is the habitat of precious Hawaiian birds and plants, and it is a playground for the islanders.

Against this background, both the State and the County of Hawaii planners have been trying to formulate a plan that will protect the mountain's natural resources and, at the same time, allow the scientific development to continue atop the mountain. The task has not been easy.

Mauna Kea, meaning the "White Mountain," extends 16,000 feet from the ocean floor to the sea level before continuing another 13,796 feet, making it the tallest mountain in the world. Commonly, however, the mountain region begins from the 6,000-foot elevation and extends to the summit.

The mountain has two distinctive zones. One covers an area from the 6,000-foot to the 10,000-foot elevation within which lie the fragile ecosystems of rare birds and unique plants, and where hunting of sheep, goats and pigs ranks among popular sporting activities on the Big Island.

The second zone covers from the 10,000-foot elevation to the summit. It is here astronomers have found the finest spot in the world to open up windows in the sky. Winter snow that dons the summit region provides breathtaking scenic beauty and rare recreational opportunities on the mountain slopes towering above the tropical Pacific.

Serious considerations for drafting a master plan for Mauna Kea were triggered in late 1974 by Acting Governor George Ariyoshi in a memorandum to Sunao Kido, chairman of the State Board of Land and Natural Resources. The memorandum stated:

"I am concerned that social pressures for more intensive use of Mauna Kea for scientific, recreational and other purposes pose a threat to the priceless qualities of that mountain . . .

"To assure that full consideration is given to all aspects of permitted, controlled and prohibited uses, you are hereby directed to develop and promulgate, as expeditiously as possible, a Master Plan for all of Mauna Kea above the Saddle Road.

"Finally, the promulgation of the Master Plan should include its adoption by the Board of Land and Natural Resources following public hearings, and should provide for both the enforcement of the Plan and procedures for its amendment."

After more than two years of study, public hearings, conducted by government and private groups, including a Mauna Kea Advisory Group, all not without controversies, "The Mauna Kea Plan" was adopted February 11, 1977 by the Board of Land and Natural Resources at a meeting in Kona.

The Plan is in no way considered a definitive planning work for the mountain. It is a set of broad guidelines to be reviewed and updated from time to time.

The plan "is a policy framework for the management of Mauna Kea." It outlines the jurisdictional responsibilities of various government agencies "for specific resources and uses."

The plan spells out five management areas within each of which guidelines on specific uses of the mountain's resources are laid down:

I. Mamane / Nalo Forest Ecosystem Management Area, which is the region extending from the 6,500-foot elevation to 9,500-foot elevation; where hunting of sheep, goats and pigs take place; and where Hawaii's Palila birds depend on the Mamane trees for its habitat and food.

II. Science Reserve Management Area, which is a region from the 10,000-foot elevation to the summit and is leased to the University of Hawaii for scientific research, and where snow play and skiing is permitted during winter months.

III. Special Natural Area and Historic / Archaeological Management Area, which includes such historic sites as Lake Waiolu, Puu Hau Kea, Adz Quarry, and Puu Pohaku.

IV. Silversword Management Area, which includes all lands now fenced off to protect the silversword plants, and which "will be managed as a nursery for supplying plants in interpretive areas or for future reestablishment in other areas of the mountain," when desirable.

V. Military Management Area, which covers the lands within Pohakuloa Military Training Area, managed by the Army under a lease agreement with the State.

In addition to the five management areas, the plan also sets out guidelines on several "special problems" affecting the use of the entire mountain.

One is the development of Hale Pohaku at the 9,200-foot elevation. A State master plan for the area calls for setting aside nine acres for the University of Hawaii, Institute for Astronomy for development of mid-level support facilities for the

scientists.

Presently, four acres of the proposed site, near the access road to the summit, are occupied by structures temporarily serving as mid-level facilities for the scientists. The master plan for Hale Pohaku proposes to replace the existing temporary buildings with new ones.

The new buildings "will be used for sleeping, eating, lounging, research support, and minor maintenance functions directly related to telescope operations at the summit."

About 700 feet downslope from the proposed mid-level support facilities area is an eight-acre area the State proposes for a park development.

Initially, two acres of this proposed park site will be developed with an information and interpretation station, parking area, and 10 picnic sites. Six acres will be reserved for future expansion.

The 8.5-mile access road to the summit from Hale Pohaku poses another special problem. The Mauna Kea Plan forbids paving of the gravel road but calls for road safety devices. Only four-wheel drive vehicles are allowed to go from the picnic area above Hale Pohaku to the summit. The summit access should be maintained by the State Department of Transportation, according to the Plan.

Electricity is produced by on-site generators to supply power to the observatories and support facilities. The Mauna Kea Plan prohibits the installation of overhead powerlines to prevent the adverse effect on the visual quality of the slopes. Underground powerlines, however, may be allowed.

The Pohakuloa State Park also is a special area which is not included in any of the five management areas. The Mauna Kea Plan calls for no change in the type of recreational use of the park. Any expansion will depend on additional water supply development.

Administration and management of Mauna Kea cuts across the jurisdictional boundaries of several government agencies, although the land mass falls within the conservation district jurisdiction of the State Department of

Land and Natural Resources. For instance, the DLNR's Divisions of Forestry, Fish and Game, and Parks, Outdoor Recreation and Historic Sites, are directly involved in the Management of all of the mountain's resources.

The University of Hawaii has the responsibility for management and upkeep of Hale Pohaku area where permanent mid-level support facilities will be located. The University also is responsible for the management and upkeep of the Mauna Kea Science Reserve at the summit.

The State Department of Transportation is responsible for the maintenance of the access road from the Saddle Road to Hale Pohaku and eventually to the summit.

Although the County of Hawaii has no jurisdiction over the mountain, it nevertheless is responsible for processing permits for building and grading and for site or design reviews. The County's Planning Department also is asked to provide comments and recommendations before the DLNR makes a land use decision affecting Mauna Kea.

In formulating the Mauna Kea Plan, differences between local and State planners developed. Until this day some of the differences still have not been settled while the three-year-old plan is being reviewed by the DLNR for rewriting and refining.

The most noticeable difference is over the limit of the number of observatories that should be allowed atop the mountain. The Mauna Kea Citizen Advisory Committee's recommendation, which is endorsed by the County Administration, was six observatories. The recommendation however was rejected by the Land Board, and at present, no limit on the number of the observatories is placed by the State agency.

Besides its scientific significance, the Big Islanders, both inside and outside of government, are concerned about the natural beauty of the mountain and about its historic and cultural heritage. Sites such as Puu Pōhaku, home of the Hawaiian

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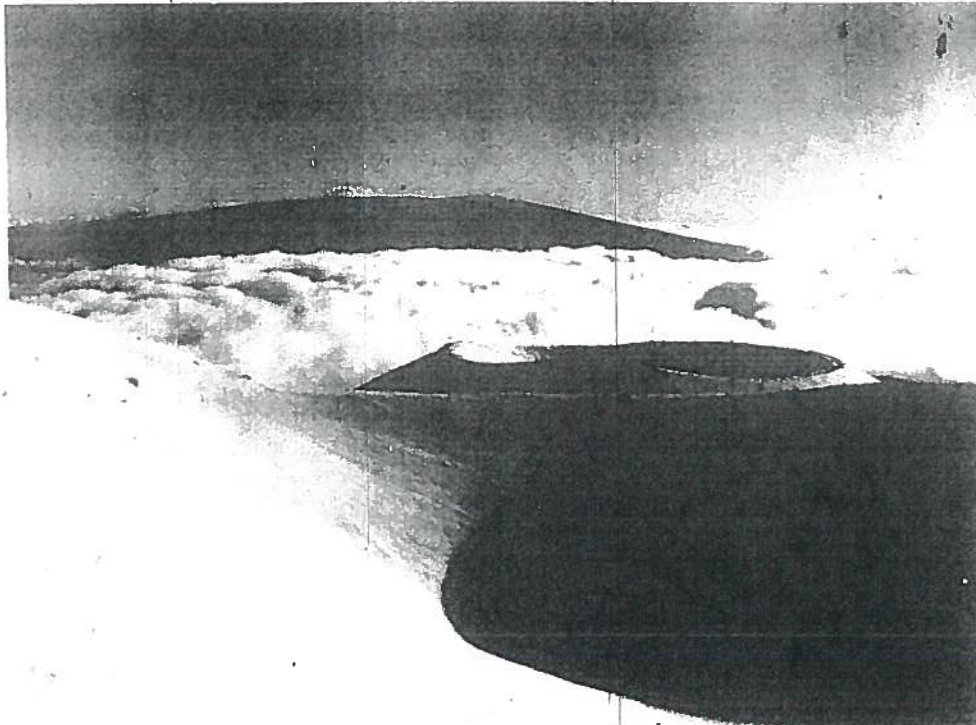


Photo by Frank Salmoiraghi

Cultural, historical view of Mauna Kea

By Patrick C. McCoy
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Mauna Kea ("white mountain") has a long and complex history, 99.99 percent of it involving repeated episodes of vulcanism and glaciation to which no man was a witness. The last volcanic eruption on the mountain predated Polynesian settlement of the Hawaiian Islands by 4,000 years or more, while the last glaciers had receded some 9,000 years before man's arrival. The culture history of Mauna Kea is thus short by comparison to its natural history of geological and biological processes, but it is no less interesting or scientifically important.

From an archaeological research perspective, it is the early Hawaiian adaptation to and exploitation of Mauna Kea's varied environments that is of most interest. Unfortunately, the material evidence (house platforms, agricultural terraces, etc.) for much of this in the lower to mid elevations has probably been destroyed in the last 100 years through land clearance for various economic purposes. What does remain has been, on the whole, superficially studied. The prehistory of the lower, windward flank of Mauna Kea long the Hamakua coast, for example, is largely unknown. At this time we can only infer that the valleys along this coastline would have been the first of Mauna Kea's extensive lands to be settled by the Hawaiians.

Exploration of the high country undoubtedly took place at an early date. Snow, a phenomenon unknown in tropical Polynesia, must have excited the adventurous to make the long, arduous walk to the summit area. That Hawaiians became familiar with the alpine country is evident in the number of upland trails and names given to cinder cones on the summit plateau, in addition to the fact that they had a snow goddess named Poli'ahu. Occasionally the remains of deceased kin were buried high up on the mountain and there are reports of certain families depositing the umbilical cord (piko) of newborn babies in Lake Waiau at the 13,020 foot elevation. On this same side of the mountain not far below the lake is an area that is by far one of the most significant archaeological sites in the Hawaiian Islands. This is the Mauna Kea Adze Quarry, a National Historic Landmark.

Archaeological investigations of the adze quarry, conducted by the Bishop Museum in 1975-76 under my direction, indicate a seasonal pattern of tool manufacture spanning a period of approximately 600-700 years. During that time thousands of roughed out, but unfinished, adzes were made, presumably for both local use and trade. No other adze quarry in the islands compares with the size and, thus, in-

vestment of labor represented in the Mauna Kea quarry. The magnitude of work undertaken in this remote, high altitude, cold environment is in itself a matter of considerable interest. It is conjectured that the quantity of readily available adze quality stone occurring above the 10,000 ft. elevation on the south flank of the mountain was the major determining factor in the exploitation pattern that developed. The preparations required to work and live at 10,000-12,400 feet above sea level is cause for further wonder.

Excavations of living quarters in the quarry indicate consumption of various species of birds and fish, but little pig or dog. With the exception of a few birds that could be obtained at not too great a distance, most of the adze makers' food, including the usual crop staples, was obviously transported from the home base on the coast. Besides food, it was also necessary to carry clothing, bedding and other material items such as that for making fires and storing water. In addition to the remains of domestic life and work activities we have found some evidence for diversions (from the rigors of an alpine existence) in the form of rock art. Apart from a few examples of artistry the quarry landscape is, however, dominated by the remains of craft specialization in tool production.

An integral part of the manufacturing process was religious ritual, the remains of which exist as simple shrines widely distributed throughout the quarry and usually in close proximity to workshops. The presence of shrines, though small and crudely constructed in comparison to communal heiau, are testimony to the function of ritual in this one form of craft specialization. There is no reason to believe, as has been suggested, that slaves were employed to work in this frequently inhospitable environment. The payoff of suffering altitude sickness, and inclement weather was material gain and, perhaps, prestige acquired through trade of a valuable commodity of pre-European life.

The European introduction of metal led to the rapid abandonment of stone tools and with it the knowledge of old quarry sites. Archaeological research is the only means of interpreting these and many other aspects of Hawaiian culture history. The degree to which archaeology can continue to achieve its goals as a social science is dependent on public attitudes toward historic preservation. In this regard, it is fair to conclude that "the future of the past is the present."

Planners ponder Mauna Kea's future

(Continued from page 2)

Goddess of Snow, and Lake Waiau atop the summit, "regarded by Hawaiians as a sacred place" and a cultural tie with the past," should not be obliterated by haphazard development. And, the rarefied atmosphere on the mountain's higher slopes and summit and its surrounding unique Hawaiian ecosystems should not be unreasonably disturbed in the name of progress or scientific development.

How Hale Pohaku should be developed remains unsettled, despite the fact that the State has drafted an environmental impact statement for its proposed development in the area. Hawaii County Planning Director Sidney Fuke, for instance, thinks that until there's agreement on the extent of development in the Science Reserve at the summit, the Plan for Hale Pohaku cannot be finalized.

Whether the summit access roads should remain unpaved is another unsettled problem. There is pressure for paving the 8.5-mile winding, one-lane road, as the traffic between the observatories and Hale Pohaku is increasing. The University in fact has asked the DLNR to reverse its policy and to allow pavement.

So it is understandable why government officials have been cautious in making comments on the uses of the mountain.

"Mauna Kea is like our shoreline," says Planning Director Sidney Fuke. "It is a natural beauty, and at the same time, it has economic and boundless recreational potentials.

"To assure its balanced and orderly development, a comprehensive plan should be developed. The need for such a plan has been the County's position, a position well-expressed in the Northeast Hawaii Community Development Plan."

"This plan would determine the capacity of Mauna Kea and then set some maximum limit to astronomy and its related developments. At the same time, it would look at means to preserve the natural character of the mountain and

provide for its diversified use."

Fuke has suggested reactivation of the Mauna Kea Citizen Advisory Committee for updating the Mauna Kea Plan and for developing a more specific management plan.

The University presently is drafting a management plan for the Science Reserve Area on the summit. The plan will set forth specific criteria for the use of the summit area as an international research site.

Chancellor Durward Long, addressing

the subject of the place of astronomy in the present and future of the University, has made the following remarks:

"In seeking the most effective way to develop programs of international quality, it has been natural for the University to look to these academic areas where the particular geographical, environmental, economic or sociological characteristics of Hawaii give it a special advantage.

"In this way it was recognized early in the 1960's that astronomy had a great potential for development as a first-class research and training program and, at the same time, could bring significant economic and cultural benefits to the Islands.

"The wisdom of the choices made by the political and academic leaders of that time has been shown in the dramatic growth of astronomy as an enterprise on Mauna Kea and Haleakala, and the rapid growth in stature of the UH research and training program within the Institute for Astronomy and the Department of Physics and Astronomy.

"Our aspiration is (and can be) no less than to develop an academic program matching the excellence of our sites; at the same time we recognize the great responsibility we have to serve as a wise and responsible custodian for the international resource represented by our high mountain peaks and especially Mauna Kea.

"The astronomy program at the University began 15 years ago and has

developed through the dedication of its staff and the constant support of the University and State administration. Today, new programs in the University which show similar promise in fields such as energy development, marine biology, and agriculture, are in the early stages of development. We look forward to seeing their growth to national and international significance as well, following the same kind of development as we see in the astronomy program."

Since the meager beginning 15 years ago, Mauna Kea now has six observatories — a UH observatory with an 88-inch telescope; two 24-inch telescope observatories; a Canada-Hawaii-France observatory with a 140-inch telescope; an 120-inch infrared observatory built by the National Aeronautics and Space Administration; and a 155-inch infrared United Kingdom observatory. And, there may be more observatories to come.

Susumu Ono, chairman of the Board of Land and Natural Resources, expects the review of the Mauna Kea Plan to be completed within the next six months.

"There are a number of considerations equally important in making recommendations for land use (affecting Mauna Kea)," says Ono. These considerations include the "need of the scientific community, the role the University plays, the recreational needs of our people on the Big Island, as well as the input we've received from the county in terms of its overall objectives and goals regarding the use of the mountain."

"At present, the ultimate goals for the mountain use are under review by the Department as part of the review of the Mauna Kea Plan," Ono says.

"Hopefully, the results of this review will further specify the kinds of goals that all of us are working to achieve in terms of mountain use."

In reviewing, Ono says his department is listening "very closely" to the University, the County government, as well as the general public.

And, the State chief protector of the natural resources in the Islands promises:

"The main thing is we have to treat it (Mauna Kea) with sensitivity."

