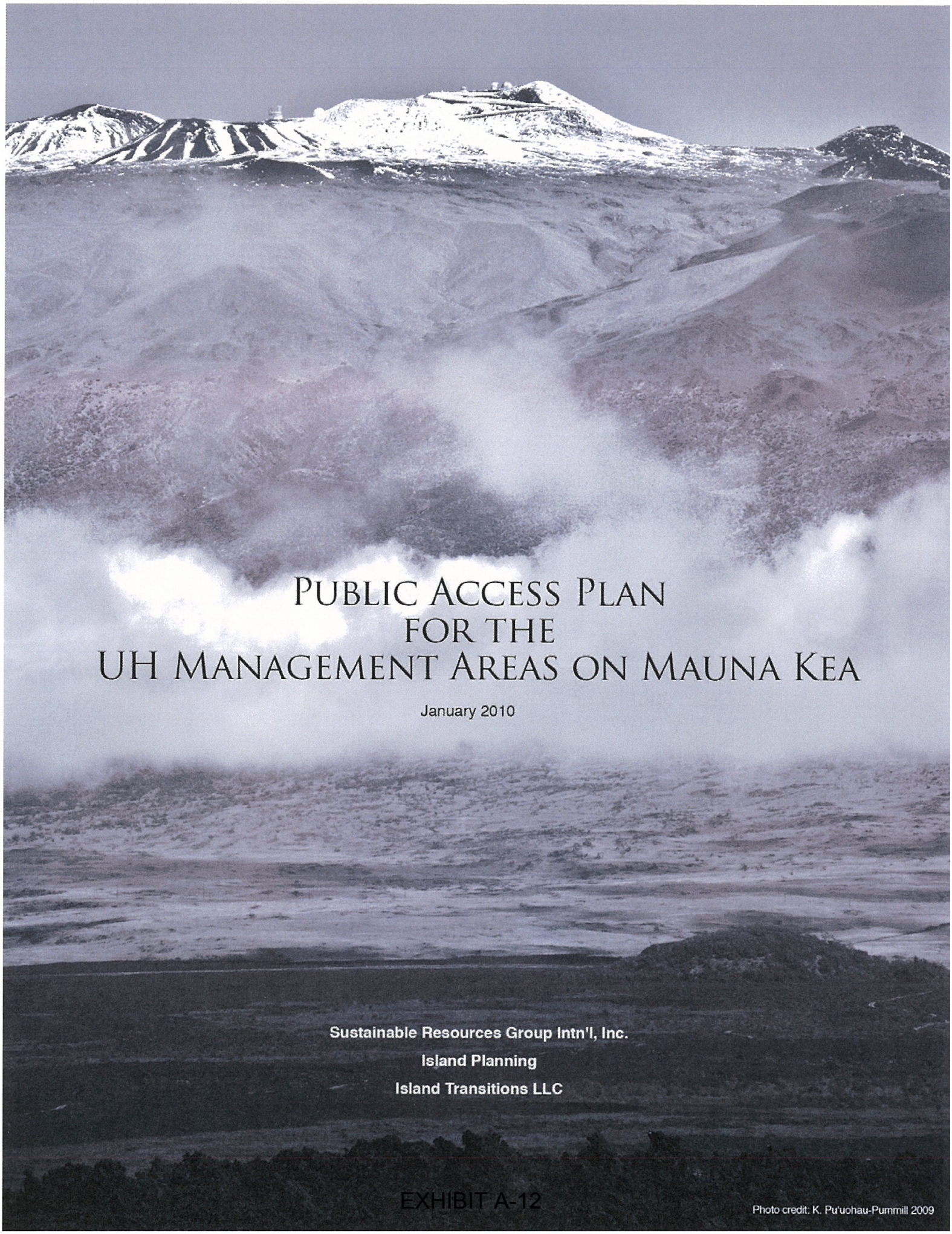

PUBLIC ACCESS PLAN FOR THE UH MANAGEMENT AREAS ON MAUNA KEA

January 2010

Sustainable Resources Group Intn'l, Inc.

Island Planning

Island Transitions LLC

EXHIBIT A-12

Photo credit: K. Pu'uohau-Pummill 2009

PUBLIC ACCESS PLAN
FOR THE
UH MANAGEMENT AREAS ON MAUNA KEA

A Sub-Plan of the Mauna Kea Comprehensive Management Plan

January 2010

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Special appreciation is due to several groups and individuals. Members of Kahu Kū Mauna generously contributed their time as a group and in subcommittee and roundtable discussions to assist in this planning process. David Byrne, Visitor Information Station (VIS) Supervisor, was readily available and enabled his staff to meet with the planners, resulting in better understanding of the ranger program, daily operations at the VIS and appreciation of how the current management of public use on the mountain has evolved over the years. The Mauna Kea Rangers, both past and present, shared quality data, observations, suggestions and concerns that can only come from daily interactions with the public on Mauna Kea. Ron Koehler and his staff at Mauna Kea Observatories Support Services (MKSS), also provided essential insight into what it takes to safely accommodate public activities and maintain infrastructure in the challenging environment atop Hawai'i's highest peak.

A list of plan participants is in Appendix C. Each of these nearly 100 individuals helped in a variety of ways: some participated in in-depth interviews; others attended structured roundtable discussions; and others responded whenever there were special needs or requests. Collectively this group served as the "brain trust" for the plan and each has contributed positively to the final outcome.

Special thanks are due to Ron Terry whose commitment to good planning and resource protection on Mauna Kea is important to this and other recent planning efforts surrounding the Mauna Kea Comprehensive Management Plan. Steve McPeek provided excellent facilitation services for the roundtable discussions. Mahalo nui to Kirk Pu'uohau-Pummill of Gemini Observatory who shared many of the quality photographs in the document, including the cover image. Other photographs were provided by individual rangers, OMKM and Lisa Hadway.

Last but not least, this plan was inspired by *ka 'āina Mauna Kea* itself. It was written with respect and recognition of the remarkable physical, cultural and spiritual values of this *wahi pana*, legendary place, so beloved by all who contributed to the plan. *Mahalo nui loa!*

Executive Summary

This Public Access Plan (PAP) is a sub-plan of the Mauna Kea Comprehensive Management Plan (CMP). It was required as a condition of approval of the CMP by the Hawai'i State Board of Land and Natural Resources (BLNR) in April 2009. The purpose of the PAP is to provide guidance to the University of Hawai'i (UH) in addressing public access in full cooperation with DLNR's authority over public access and activities within the UH Management Areas, including the Mauna Kea Science Reserve, Summit Access Road, and mid-level facilities at Hale Pōhaku. The objective of the PAP is to provide a set of principles and policies to guide the University in the development of management actions relating to public and commercial activities and eventual administrative rules that will be subject to review and approval of BLNR.. The PAP also discusses current and future public and commercial activities in the UH Management Areas; terms of the lease with regards to public hunting, recreational activities and existing trails; public access-related issues; and makes recommendations regarding those issues.

The University is responsible for the UH Management Areas on Mauna Kea under the terms of its lease agreements with BLNR. This responsibility includes the obligation to protect the natural, cultural and scientific resources on the lands leased from the State, and to work with the Department of Land and Natural Resources (DLNR) to ensure that the rich heritage of Mauna Kea is preserved for future generations. The University's challenge lies in balancing the public's right to access Mauna Kea while protecting its natural, cultural and scientific resources, responsibly managing its use, and protecting public health and safety.

Key tenets of the Plan are:

Public Resource

The UH Management Areas on Mauna Kea are part of the Public Land Trust, and the State and UH hold these lands in trust for Native Hawaiians and the general public.

Health and Safety

The protection of public health and safety is of utmost importance to UH as manager of these public lands.

Education

The most effective management tool is the ability of each individual to take responsibility for his/her own actions and to be open to learning new behaviors. An informed public is best prepared to make good decisions and act responsibly.

Traditional and Customary Rights

The ability of Native Hawaiians to exercise their traditional and customary rights in the UH Management Areas is legally and constitutionally protected and subject to reasonable regulation of such rights as permitted by law.

Adaptive Management

Management decisions will be based on reliable data. Management actions will be adapted as lessons are learned from the outcomes of past and current management activities.

Management Methods and Authority

UH has the responsibility to adopt formal rules to manage public activities in the UH Management Areas, subject to review and approval of the BLNR. A range of management control methods will be used, with compliance first sought at the lowest levels of control.

The Public Access Plan is organized into seven main sections:

Section 1. Introduction

Provides background, purpose and objective of the PAP; its relationship to the Mauna Kea CMP and other planning efforts; the PAP's methodology; and highlights selected laws related to public access rights on public lands.

Section 2. Description of Planning Area

Describes the planning area geographically, its surrounding land owners and land use designations, and the UH and DLNR management entities involved. Summarizes the regulatory environment; describes the planning area's infrastructure and important natural, cultural and scientific resources; highlights selected laws relevant to Native Hawaiian traditional and customary rights on Mauna Kea; and describes key health and safety concerns.

Section 3. Summary of Public Activities

Provides a brief history of public activities in the planning area; describes data sources and collection methods used; and describes what is currently known about the activity levels and impacts of the various user groups in the planning area.

Section 4. Public Access Control Methods

Describes the range of public access control methods currently available and used in the UH Management Areas, ranging from personal responsibility and education at the lowest levels of control, to higher levels in the form of contractual requirements and situational control, to collaborative and primary law enforcement at the highest level.

Section 5. Principles and Policies

Identifies a set of principles and supporting policies intended to guide the development of management actions relating to public and commercial activities and future administrative rules to be adopted for the UH Management Areas.

Section 6. Issues and Recommendations

Details the key public access-related issues that were identified by participants in the planning process and, for UH consideration, makes recommendations regarding the issues based on suggestions received as well as from other sources of information.

Section 7. Public Access Management Plan Updates

Recommends reviews and updates of the Public Access Plan every five years as part of the evaluation and revision process for the Mauna Kea CMP.

A list cross-referencing Mauna Kea CMP management actions to related sections in the Public Access Plan is provided in Table 1 to aid managers tasked with implementing both plans. The sections listed in the table provide background information related to, or other pertinent information in support of, the Mauna Kea CMP management actions.

Table 1. Mauna Kea CMP Management Actions Cross-Referenced to the Public Access Plan

	Mauna Kea CMP Management Action	PAP Section
	Management	
CR-1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, *kūpuna*, cultural practitioners, the Office of Hawaiian Affairs and other Native Hawaiian groups, including the Mauna Kea Management Board's Hawaiian Culture Committee, toward the development of appropriate procedures and protocols regarding cultural issues.	2.3, 3.3.9, 5.2, 6.1, 6.2, 6.3, 6.8
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	3.3.5, 4.2, 5.2, 6.1, 6.2, 6.3
	Cultural Practices	
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings.	3.3.9, 5.2, 6.1, 6.3, 6.8
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	2.7.2, 2.7.3, 3.3.9, 5.2, 6.1, 6.3, 6.8
CR-9	A management policy for the culturally appropriateness of building ahu or "stacking of rocks" will need to be developed by Kahu Kū Mauna who may consider similar policies adopted by Hawai'i Volcanoes National Park.	3.3.9, 6.3, 6.8
	Historic Properties	
CR-10	Develop and implement a historic property monitoring program to systematically monitor the condition of the historic district and all historic properties, including cultural sites and burials.	2.7.2, 2.7.3, 5.2, 6.4
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.	2.5.1, 4.5, 4.6, 5.1, 5.2, 6.5
	Threat Prevention and Control	
NR-1	Limit threats to natural resources through management of permitted activities and uses.	2.5.1, 2.5.2, 2.5.3, 2.7.1, 4.3, 5.2, 6.3, 6.4, 6.6
NR-2	Limit damage caused by invasive species through creation of an invasive species prevention and control program.	2.7.1, 6.3, 6.4
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.	2.7.1, 3.3.5, 4.2, 5.2, 6.1, 6.2, 6.3, 6.6, 6.7
	Program Management	
NR-13	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.	4.2, 4.5, 5.2, 6.1, 6.2, 6.3, 6.5
NR-14	Use the principles of adaptive management when developing programs and methodologies. Review programs annually and revise any component plans every five years, based on the results of the program review.	2.5.4, 5.1, 5.2, 6.4, 6.7, 7
	Inventory, Monitoring, and Research	
NR-16	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.	5.2, 6.4

	Mauna Kea CMP Management Action	PAP Section
	Program Development	
EO-1	Develop and implement education and outreach program.	2.7.1, 4.2, 5.2, 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8
	Education	
EO-2	Require orientation of users, with periodic updates and a certificate of completion, including but not limited to visitors, employees, observatory staff, contractors, and commercial and recreational users.	4.1, 4.2, 6.1, 6.5, 6.6, 6.7
EO-3	Continue to develop, update, and distribute materials explaining important aspects of Mauna Kea.	4.1, 4.2, 5.1, 5.2, 6.1, 6.2, 6.3, 6.6, 6.7
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).	4.2, 5.2, 6.2, 6.6
EO-5	Develop interpretive features such as self-guided cultural walks and volunteer-maintained native plant gardens.	6.2
EO-6	Engage in outreach and partnerships with schools, by collaborating with local experts, teachers, and university researchers, and by working with the 'Imiloa Astronomy Center of Hawai'i.	4.1, 4.2, 5.2, 6.1
	Outreach	
EO-7	Continue and increase opportunities for community members to provide input to cultural and natural resources management activities on Mauna Kea, to ensure systematic input regarding planning, management, and operational decisions that affect natural resources, sacred materials or places, or other ethnographic resources with which they are associated.	5.2, 6.1, 6.3, 6.4, 6.6, 6.7, 6.8
	Protection of Astronomical Resources	
AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	5.1, 6.3, 6.4
	General Management	
ACT-1	Continue and update managed access policy of 1995 Management Plan.	2.5.2, 5.2, 7
ACT-2	Develop parking and visitor traffic plan.	5.2, 6.4, 6.6, 6.7
ACT-3	Maintain a presence of interpretive and enforcement personnel on the mountain at all times to educate users, deter violations, and encourage adherence to restrictions.	4.2, 4.4, 4.5, 4.6, 5.2, 6.1, 6.2, 6.5, 6.6, 6.7
ACT-4	Develop and enforce a policy that maintains current prohibitions on off-road vehicle use in the UH Management Areas and that strengthens measures to prevent or deter vehicles from leaving established roads and designated parking areas.	2.5.1, 2.5.2, 2.6.3, 5.2, 6.3, 6.5
	Recreational	
ACT-5	Implement policies to reduce impacts of recreational hiking	3.3.7, 5.2, 6.2, 6.3
ACT-6	Define and maintain areas where snow-related activities can occur and confine activities to slopes that have a protective layer of snow.	3.3.5, 5.2, 6.1, 6.3, 6.4, 6.7
ACT-7	Confine University or other sponsored tours and stargazing activities to previously disturbed ground surfaces and established parking areas.	2.5.3, 2.6.2, 3.3.3, 5.2
ACT-8	Coordinate with DLNR in the development of a policy regarding hunting in the UH Management Areas.	2.5.1, 3.3.6, 5.2
	Commercial	
ACT-9	Maintain commercial tour permitting process; evaluate and issue permits annually.	2.5.3, 2.5.4, 3.3.3, 4.3, 5.2, 6.1, 6.7

	Mauna Kea CMP Management Action	PAP Section
ACT-10	Ensure OMKM input on permits for filming activities	2.5.3, 3.3.3, 4.3, 6.1, 6.7
	Laws and Regulations	
P-1	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.	2.4, 2.5, 2.5.1, 2.5.2, 2.5.3, 5.1
P-4	Educate management staff and users of the mountain about all applicable rules and permit requirements.	4.2, 5.2, 6.1, 6.2, 6.5
	Enforcement	
P-5	Continue coordinating with other agencies on enforcement needs.	4, 6.5
P-6	Obtain legal authority for establishing, and then establish, a law enforcement presence on the mountain that can enforce rules for the UH Management Areas on Mauna Kea.	4.4, 4.5, 4.6, 5.2, 6.5, 6.6
P-8	Enforce conditions contained in commercial and Special Use permits.	2.5.3, 3.3.3, 4.3, 4.5, 4.6, 6.5
	Routine Maintenance	
IM-6	Develop and implement an erosion inventory and assessment plan.	2.6.3, 6.3, 6.4
	Infrastructure	
IM-9	Evaluate need for additional parking lots and vehicle pullouts and install if necessary.	5.2, 6.4, 6.7
IM-10	Evaluate need for additional public restroom facilities in the summit region and at Hale Pōhaku, and install close-contained zero waste systems if necessary.	5.2, 6.4, 6.6, 6.7, 6.8
OI-2	Develop training plan for staff and volunteers.	5.1, 5.2, 6.1, 6.4, 6.5
OI-3	Maintain and expand regular interaction and dialogue with stakeholders, community members, surrounding landowners, and overseeing agencies to provide a coordinated approach to resource management.	5.1, 5.2, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7
OI-4	Establish grievance procedures for OMKM, to address issues as they arise.	6.6
OI-5	Update and implement emergency response plan.	6.1, 6.4, 6.5, 6.7
MEU-1	Establish a reporting system to ensure that the MKMB, DLNR, and the public are informed of results of management activities in a timely manner.	6.4, 6.6, 7
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	7
MEU-3	Revise and update planning documents, including the master plan, leases, and subleases, so that they will clearly assign roles and responsibilities for managing Mauna Kea and reflect stewardship matters resolved with DLNR.	7

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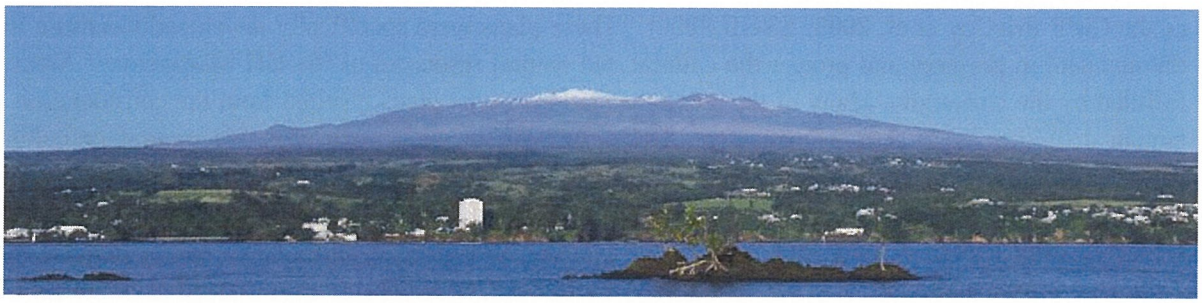
Acronyms

AG	Attorney General
BLNR	Board of Land and Natural Resources
CDUP	Conservation District Use Permit
CMP	Comprehensive Management Plan
CRMP	Cultural Resource Management Plan
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOCARE	Division of Conservation and Resources Enforcement
DOFAW	Division of Forestry and Wildlife
FR	Forest Reserve
GMA	Game Management Area
HAR	Hawai'i Administrative Rule
HCPD	Hawai'i County Police Department
HRS	Hawai'i Revised Statute
HVNP	Hawai'i Volcanoes National Park
IfA	Institute for Astronomy
MKMB	Mauna Kea Management Board
NAR	Natural Area Reserve
NARS	Natural Area Reserves System
NRMP	Natural Resources Management Plan
OCCL	Office of Conservation and Coastal Lands
OHA	Office of Hawaiian Affairs
OMKM	Office of Mauna Kea Management
PTA	Pōhakuloa Training Area
SHPD	State Historic Preservation Division
UH	University of Hawai'i
UHH	University of Hawai'i, Hilo
VIS	Visitor Information Station



1 Introduction

1.1 Background and Purpose of the Public Access Plan

The *Mauna Kea Public Access Plan* (hereafter, "PAP") was initiated in response to a conditional requirement made pursuant to approval of the *Mauna Kea Comprehensive Management Plan* (CMP) by the Board of Land and Natural Resources (BLNR) in April 2009. BLNR required completion and approval of the Public Access Plan as a sub-plan of the CMP within one year or prior to the submittal of a Conservation District Use Application, whichever occurs first. The approval expressly stated that "BLNR has not delegated any authority (not already in existence) to the University with respect to land use approvals, leasing or public access at Mauna Kea."

The purpose of this Public Access Plan is to provide guidance to the University of Hawai'i (UH) in addressing public access in full cooperation with DLNR's authority over public access and activities within the UH Management Areas on Mauna Kea, including the Mauna Kea Science Reserve, Summit Access Road, and mid-level facilities at Hale Pōhaku. The Mauna Kea CMP sets broad guidelines for managing existing and future activities and uses, to ensure ongoing protection of Mauna Kea's cultural and natural resources. The Public Access Plan builds on the Mauna Kea CMP by more specifically addressing the issues and opportunities relating to public and commercial activities in the UH Management Areas.

1.2 Objective of the Public Access Plan

The objective of the Public Access Plan is to provide a set of principles and policies (Section 5) to guide the University in the development of management actions relating to public and commercial activities and eventual administrative rules in the UH Management Areas on Mauna Kea. Administrative rules are subject to the review and approval of BLNR. The principles and policies are intended to ensure protection of Mauna Kea's rich cultural, natural and scientific resources while accommodating public activities and will also be used to guide management decisions relating to public access in the UH Management Areas.

1.3 Other Public Access-Related Planning Efforts

1.3.1 Related Mauna Kea CMP Sub-Plans

As stated above, the CMP addresses management needs to ensure resource protection. The *Cultural Resources Management Plan for the UH Management Areas on Mauna Kea* (CRMP) and the *Natural Resources Management Plan for the UH Management Areas on Mauna Kea* (NRMP) are also sub-plans

of the CMP (McCoy et al. 2009; SRGII 2009).[1] These plans were specifically developed to ensure that the mandate to preserve and protect the cultural and natural resources of the UH Management Areas is fulfilled by the University. Many of the recommendations in the plans resulted from the consideration of human activities in the UH Management Areas. Activity in areas with sensitive natural or cultural resources can impact these resources through disturbance, habitat alteration, or introduction of invasive plants and animals. Both plans provide detailed information on Mauna Kea's resources, identify threats to resources from human activity, and outline management strategies to minimize potential impacts. See Appendix A for a table that cross-references sections in the PAP with sections in related plans for ease of reference.

1.3.2 UH Rule-Making Authority

The lack of statutory authority for the University to implement administrative rules has been identified as an impediment to protecting cultural and natural resources, ensuring public health and safety, and enabling enforcement action (Office of the Legislative Auditor 2005). In addition, some of the management actions identified in the Mauna Kea CMP require rule-making authority. On June 18, 2009, the governor signed bill HB1174 HD3 SD2 CD1, into law as Act 132 (2009), giving UH the authority to develop, implement and enforce rules and regulations for public and commercial activities within the UH Management Areas (see Appendix B). Types of public access activities that could be covered by administrative rules include: general access to sensitive resource areas; traffic and off-road vehicle use; recreational activities; and commercial activities. Act 132 specifies that UH shall address and reconcile any conflicts with other statutes or rules that are applicable to the Mauna Kea lands and adopt rules that are consistent with the Department of Land and Natural Resources' (DLNR) administrative rules pertaining to the adjacent State Forest Reserve and Natural Area Reserve. The Act gives UH the authority to collect fees for use of lands and facilities; adopt rules to regulate public and commercial activities; and set and assess administrative fines. Consultation with the Office of Hawaiian Affairs (OHA) is required to ensure that the rules will not affect any traditional and customary rights. Consultation with DLNR will be conducted to ensure consistency with existing administrative rules. In developing public access-related administrative rules pursuant to Act 132 it will be necessary for the UH to work closely with BLNR, which currently holds the authority over rules and management of public access on state-owned lands.

1.4 Summary of Methodology

1.4.1 Defining "Public"

It is important to clarify the definitions of "public" as used in this Public Access Plan. All people, at one time or another, are members of the general public. It would be rare for anyone to never venture into public facilities or parks and thus become part of the general public. Within the general public are different "user groups" that are subject to varying rules, regulations and guidelines, depending on the activity or purpose that brings them into the Mauna Kea region. Here are three examples:

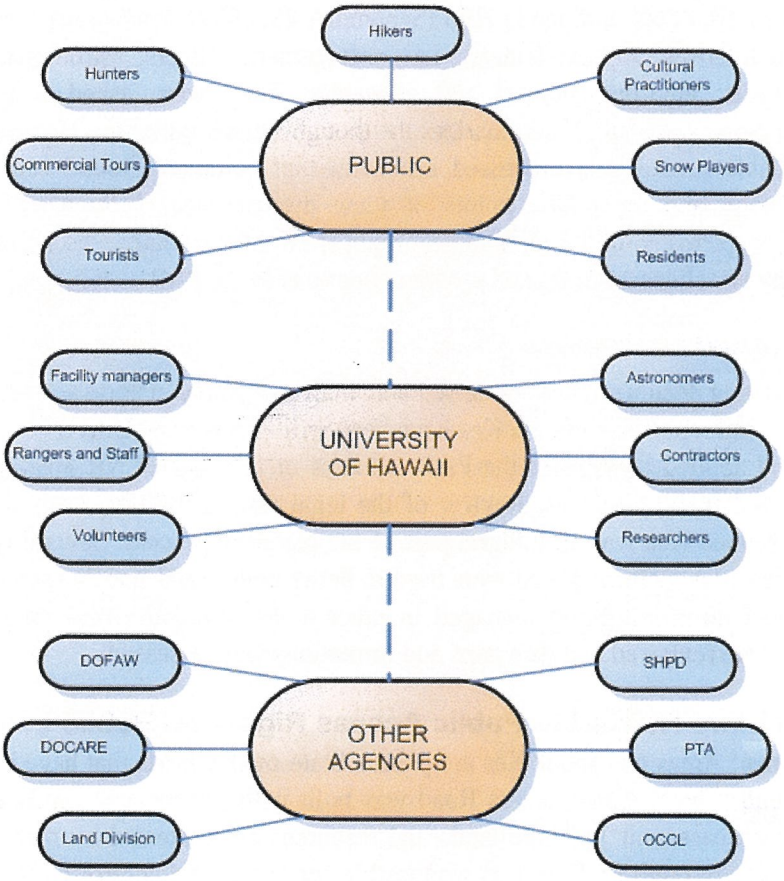
- employees of the facilities at Hale Pōhaku and the observatories at the summit are not members of the general public when they are on duty but become part of the general public when they are off-duty and touring with family and friends;

[1] Although sub-plans of the CMP, the CRMP and the NRMP were in development prior to the CMP, and their findings informed both the CMP and this PAP.

- Native Hawaiians are members of the general public and in addition have traditional and customary rights that are legally protected. Native Hawaiian cultural practitioners have the rights and privileges of the general public in addition to the unique rights afforded them when performing traditional and customary practices; and

- any member of the general public or Native Hawaiian cultural practitioner will be subject to rules, regulations and guidelines, depending on where they are on the mountain and what they are doing. If you are hunting, you are subject to hunting rules and regulations. If you are hiking, you need to be aware of the rules, regulations and guidelines that govern the particular areas you are traversing.

Figure 1-1. Who's in the Mauna Kea Summit Region?



1.4.2 Interviews

Recognizing that diverse activities and purposes bring people into the Mauna Kea upper elevation lands, in-depth interviews were conducted with approximately 60 individuals[2] who have extensive knowledge of public and Native Hawaiian activities on Mauna Kea and, in some cases, over 20 years of experience working in the region (see Appendix C). Input from members of nearly all of the interest groups and management entities depicted in Figure 1-1 was obtained to inform the development of the plan. Recommendations in the PAP were significantly influenced by the wide range of viewpoints shared by participants in the planning process. There will always be others that could/should have been interviewed. Plaintiffs involved in an ongoing lawsuit against UH were asked to participate but declined. See Appendix D for a copy of the letter received from KAHEA on behalf of the litigants.

1.4.3 Roundtable Discussions

Two professionally facilitated roundtable discussions were held with a total of 22 participants: one in Waimea (September 16, 2009) and one in Hilo (September 23, 2009). Each group was selected to include Hawaiian cultural interests, *kūpuna* (elders), law enforcement officers, astronomers, hunters, rangers, hikers, snow players, environmentalists and educators. They were asked a series of potentially controversial questions. Appendix C summarizes the thoughts and suggestions that were revealed in those meetings. Roundtable participants expressed optimism that common ground can be identified when people with differing and passionate points of view discuss their differences in a civil and safe environment, as was provided in the roundtables. Input from the roundtable discussions helped guide the development of the principles, policies and recommendations in the PAP.

1.4.4 Literature and Data Review

A large body of written documents was reviewed and analyzed. Many historic and archaeological studies, management plans and reports on Mauna Kea have been written since the University's lease began. These were reviewed and applied throughout the PAP. Minutes of relevant BLNR meetings contained public testimony that added to the analyses. Review of the legal responsibilities, laws and rules that govern public access on Mauna Kea was an integral part of the planning process. Several types of publications (e.g. journal articles, management plans) were used to better understand how human impacts in parks and outdoor recreational areas are being managed in other areas. Available data on public activities and potential impacts were reviewed and data gaps and limitations were assessed.

1.5 Selected Laws Related to Public Access Rights on Public Lands

The UH Management Areas on Mauna Kea are public, State-owned lands that have been leased to UH by the State since 1968. The Summit Access Road was built with government funds and is a public road ("non-exclusive road easement"). Public lands and resources are protected by many of Hawai'i's laws, and the State DLNR, through its Board, is responsible for exercising control over public lands that are

[2] Past and present Mauna Kea Rangers; land, facility and program managers with Mauna Kea responsibilities; Division of Conservation and Resources Enforcement (DOCARE), Hawai'i County Police Department (HCPD) and Hawai'i Volcanoes National Park (HVNP) law enforcement officers; administrators of Pōhakuloa Training Area, 'Imiloa Astronomy Center, DLNR Divisions and OHA; members of Kahu Kū Mauna, Mauna Kea Management Board and Environment Committee; Native Hawaiian cultural practitioners; leaders in the Native Hawaiian community; commercial tour operators; astronomers; archaeologists and historians; hikers; hunters; snow play enthusiasts and a physician who does many of the physical exams of Mauna Kea workers.

held in trust for the benefit of Hawai'i's people. This section highlights a few laws for their special relevance to public access rights in the UH Management Areas on Mauna Kea.

Public Land Trust

The UH Management Areas on Mauna Kea are part of the "Public Land Trust." Lands in the Public Land Trust were granted to the State of Hawai'i under Section 5(b) of the Admission Act in 1959, with the exception of "available lands" under Section 203 of the Hawaiian Homes Commission Act of 1920. The Hawai'i State Constitution directs that these lands be "held by the State as a public trust for native Hawaiians and the general public" (Article XII, Section 4). Additionally, Section 5(f) of the Admission Act[3] and Hawai'i Revised Statute (HRS) §171-18 identify five purposes for which the State shall hold these lands in trust:

1. support of the public schools and other public education institutions;
2. betterment of the conditions of Native Hawaiians;
3. development of farm and home ownership on as widespread a basis as possible;
4. the making of public improvements; and
5. provision of lands for public use.

HRS §171, Management and Disposition of Public Lands

HRS §171-3 requires that DLNR, headed by the BLNR, manage, administer, and exercise control over public lands and waters. HRS §171-26 states that prior to the disposition of any public lands, BLNR shall lay out and establish a reasonable number of rights-of-way for public access to public beaches, game management areas, public hunting areas, public forests and forest reserves. HRS §171-35(5) requires every lease issued by BLNR to contain "where applicable, adequate protection of forests, watershed areas, game management areas, wildlife sanctuaries, and public hunting areas, reservation of rights-of-way and access to other public lands, public hunting areas, game management areas, or public beaches, and prevention of nuisance and waste."

The 1968 lease (General Lease No. S-4191) between UH and the State acknowledges the presence of public trails, hunting and recreation rights (see Appendix E). It places responsibility for regulating hunting and recreation activities on BLNR, stating further that hunting and recreation activities "shall be coordinated with the activities of the Lessee" and such activities "shall be limited to day-light hours only." The Mauna Kea–Humu'ula and Mauna Kea–'Umikoa Trails, and "all other existing trails" were excluded from the lease and reserved to the State "together with rights of access over and across said trails" (see Section 2.6.3).

Highways Act of 1892

Historic Hawaiian trails falling under the Highways Act of 1892 may also be considered part of the Public Land Trust. According to HRS §264-1, "[a]ll trails, and other nonvehicular rights-of-way in the State declared to be public rights-of-way by the Highways Act of 1892 ... are declared to be public trails ... under the jurisdiction of the state board of land and natural resources."

[3] The "ceded lands" that were being held in trust by the United States after receiving them from the Republic of Hawai'i at the time of Annexation in 1898 were returned to the State of Hawai'i by the United States upon Statehood and are included in the Section 5(f) land trust.

The Highways Act of 1892 declared as "public highways" all roads or trails existing at the time of the passage of the Act that were dedicated, surrendered or abandoned to public use.[4] Thus, if the trails existed in 1892 and were dedicated, surrendered or abandoned to public use at the time of the Act (abandoned for five years at the time of the Act), these trails would have become government land and may be considered part of the Public Land Trust today. Only two historic Hawaiian trails appear on early maps in what are now the UH Management Areas, the Mauna Kea–Humu'ula and Mauna Kea–'Umikoa Trails. Of these two trails, only the Mauna Kea–Humu'ula Trail is clearly noted on a map and in field notes by W. D. Alexander's survey party in 1892. As such, this is the only historic trail, also referred to as the "Trail to Kalai'eha" and "Kalai'eha-Waiau Trail," that has been found on documents that date to the period covered by the Highways Act of 1892.

[4] *In re Application of Kelley*, 50 Haw. 567, 579, 445 P.2d 538, 546 (1968).

2 Description of Planning Area

Several entities share responsibility for Mauna Kea upper elevation lands, and management requires coordination among agencies charged with managing access and enforcing the rules and regulations that govern the different jurisdictional areas. Because living things, ecosystem processes, and cultural practices are not usually confined by administrative boundaries, it is important for the PAP to consider the user activities, management issues and regulations (or lack thereof) on lands both within and adjacent to the focus area. The scope of the discussion often incorporates features within the general boundaries of approximately 9,000 ft to the summit, including lands adjacent to the UH Management Areas such as the Mauna Kea Ice Age Natural Area Reserve (NAR) and the Mauna Kea Forest Reserve; both properties managed by DLNR. While discussion covers these adjacent areas, this Public Access Plan has been developed specifically for the UH Management Areas.

2.1 Description of UH Management Areas on Mauna Kea

The UH Management Areas on Mauna Kea extend from approximately 9,200 ft to the summit at 13,796 ft, encompassing three distinct areas: the Mauna Kea Science Reserve, the mid-level facilities at Hale Pōhaku, and the Summit Access Road (see Figure 2-1 and Figure 2-2).

Mauna Kea Science Reserve (TMK: (3) 4-4-15:09): The Mauna Kea Science Reserve was established in 1968 through a 65-year lease (General Lease No. S-4191) between BLNR and the University (see Appendix E). It encompasses 11,288 acres (ac) above approximately 11,500 ft, except for the area within the Mauna Kea Ice Age NAR.[1] According to the lease the Science Reserve is to be used "as a scientific complex." The University's Master Plan for the Mauna Kea Science Reserve (2000 Master Plan) designated 525 ac of the leased land as an "Astronomy Precinct," where development is to be consolidated to maintain a close grouping of astronomy facilities and support infrastructure. The remaining 10,763 ac are designated a Natural/Cultural Preservation Area in order to protect natural and cultural resources (Group 70 International 2000).

[1] The Science Reserve originally encompassed approximately 13,321 acres, but in 1998 2,033 acres were withdrawn as part of the Mauna Kea Ice Age NAR.

Mid-level facilities at Hale Pōhaku (TMK (3) 4-4-15:12): The Hale Pōhaku parcel was established by General Lease No. S-5529 between BLNR and the University, which extends through 2044. This 19.3 ac parcel is situated at an elevation of about 9,200 ft, and encompasses the Onizuka Center for International Astronomy including the mid-level support facilities for the observatories and the Visitor Information Station (VIS).

Summit Access Road: A road parcel was established by a Grant of Easement (No. S-4697) between BLNR and the University. It includes the Summit Access Road (a.k.a. John A. Burns Way) and a strip of land approximately 400 yards wide on either side of the road, excluding areas within the NAR. The parcel extends from Hale Pōhaku to the boundary of the Science Reserve, at approximately 11,500 ft, and contains a portion of the Summit Access Road. The remainder of the Access Road continues to the summit through the Science Reserve.

2.2 Surrounding Land Ownership and Land Use Designations

The diversity of land divisions and land uses on Mauna Kea (see Figure 2-3 and Figure 2-4) requires coordinated management. This section describes the variety of land uses on Mauna Kea that are not part of the UH Management Areas and which agencies are responsible for their management (see Sections 2.4 and 2.5 for agency responsibilities and regulations).

Conservation District Land: In 1964, Mauna Kea lands were placed within the resource subzone of the State's Conservation District. Management of the two million acres of Conservation District land in Hawai'i is the responsibility of DLNR and BLNR and is guided by a number of Federal and State laws, statutes, and rules. Hawai'i Administrative Rule (HAR) §13-5 regulates land use in the Conservation District for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use, to promote their long-term sustainability and the public health, safety and welfare.

Mauna Kea Ice Age Natural Area Reserve: The Mauna Kea Ice Age NAR, established in 1981, is comprised of two parcels that are adjacent to the UH Management Areas. The NAR is under the jurisdiction of DLNRs Division of Forestry and Wildlife (DOFAW) and overseen by the Natural Area Reserves System Commission.

Mauna Kea Forest Reserve and Game Management Area: Forest Reserve lands encompass approximately 52,500 acres above 7,000 ft surrounding the UH Management Areas, Hale Pōhaku, and the Mauna Kea Ice Age NAR. The Mauna Kea Forest Reserve (FR) and Game Management Area (GMA) is under the jurisdiction of DOFAW. Game Management Areas are lands that are managed for public hunting opportunities.

Pōhakuloa Training Area (PTA): PTA is the largest military training area in Hawai'i, extending up the lower slopes of Mauna Kea to approximately 6,800 ft. PTA lands are under the jurisdiction of DLNR, with a portion having been leased to the US Army since 1956.

Hakalau Forest National Wildlife Refuge: The Hakalau unit of the refuge occupies an area between 2,500 ft and 6,600 ft on the northeast slopes of Mauna Kea.

Hawaiian Home Lands: The Department of Hawaiian Home Lands (DHHL) has jurisdiction over approximately 56,200 acres on the northeast slopes of Mauna Kea ranging from ~ 4,500 ft to 9,000 ft.

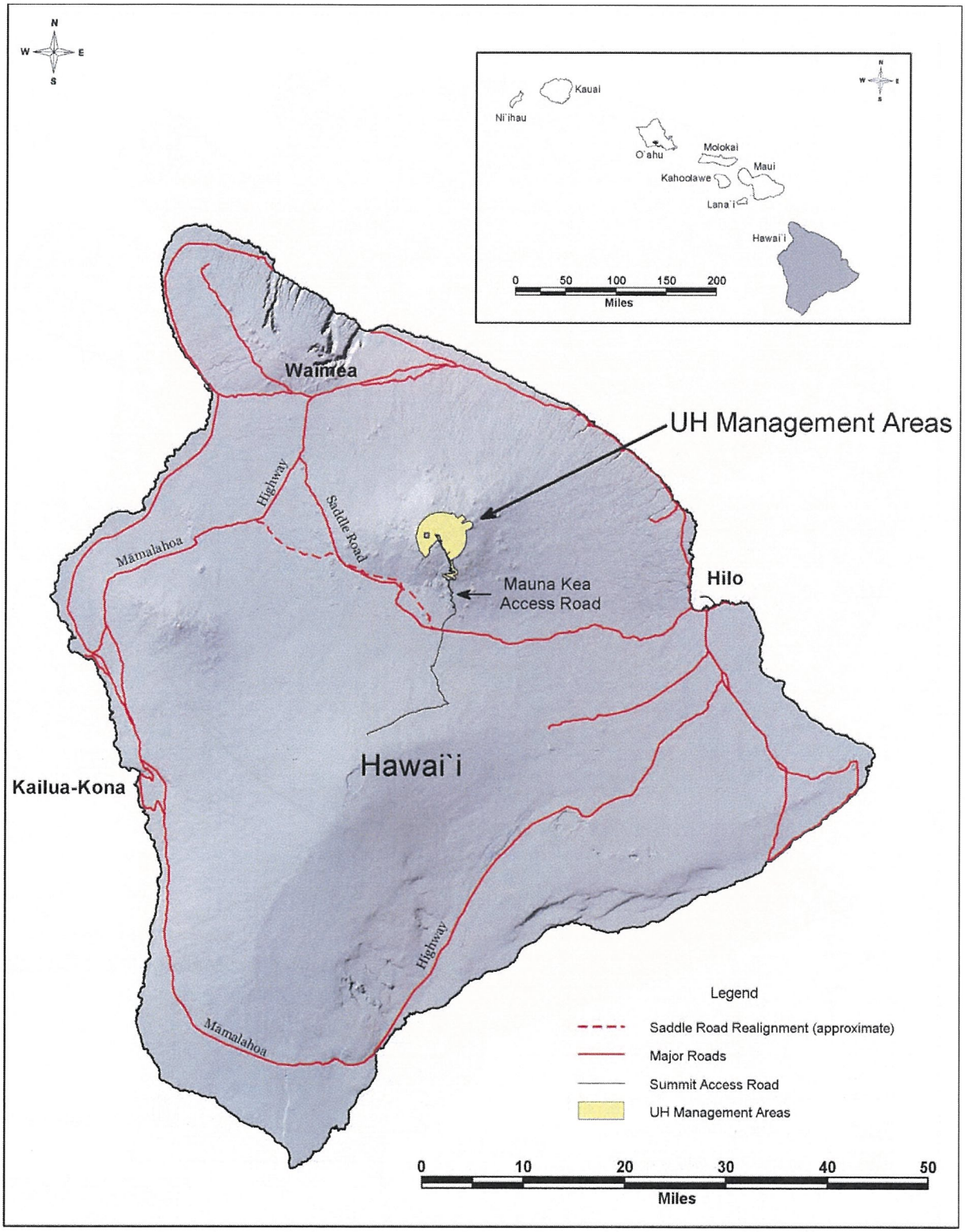


Figure 2-1. Project Location Map

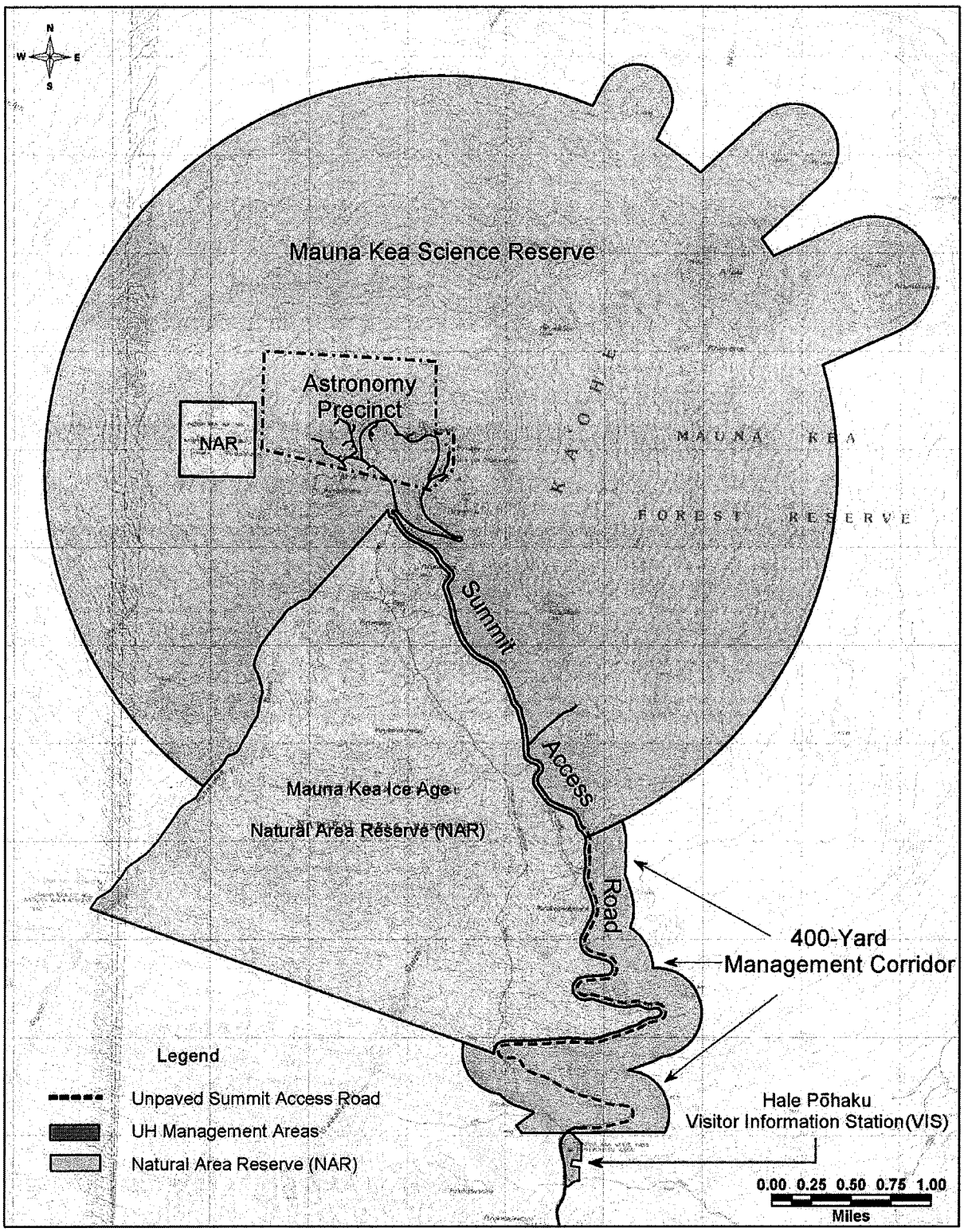


Figure 2-2. UH Management Areas

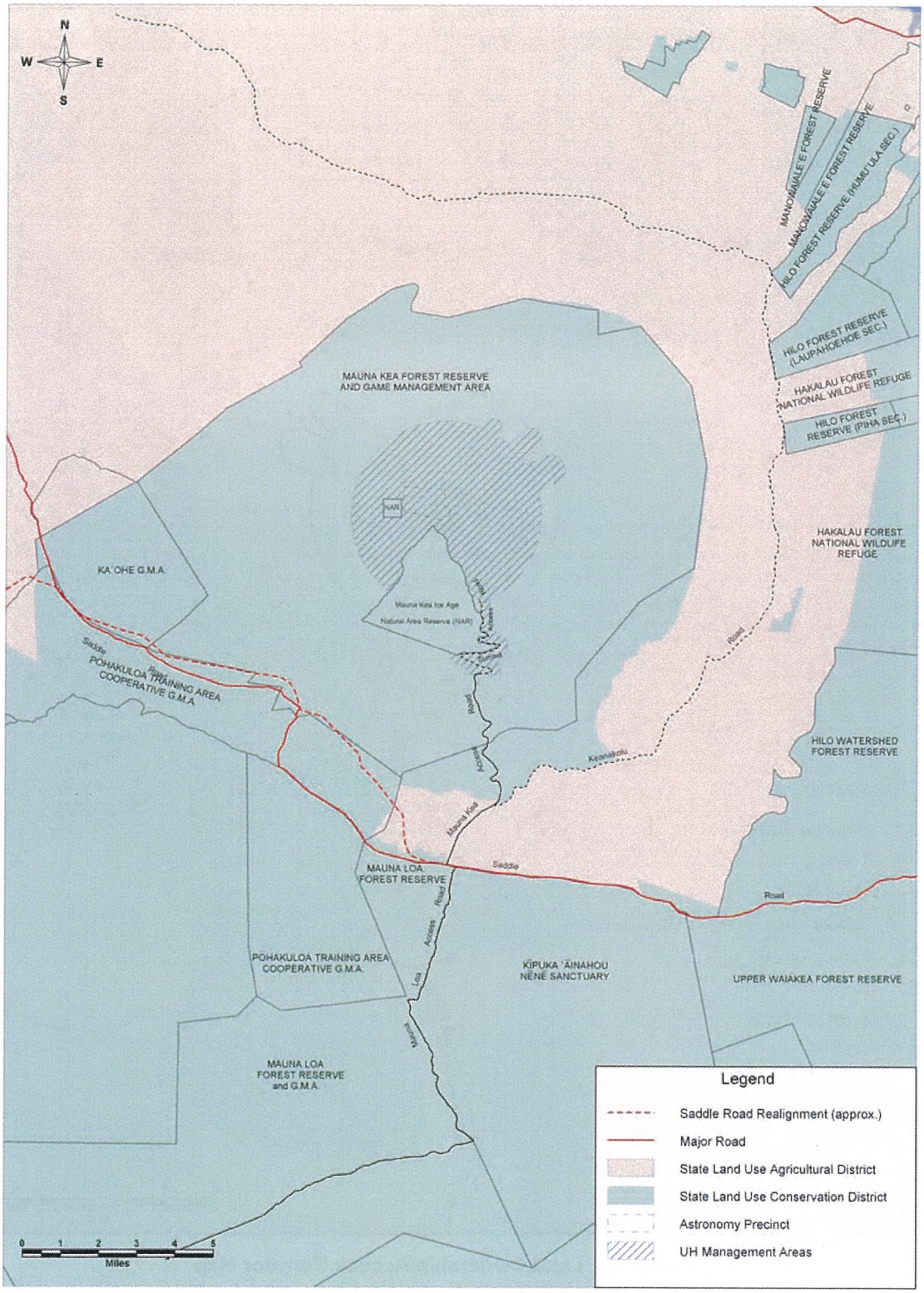


Figure 2-3. Surrounding State Land Use Districts and State Land Designations

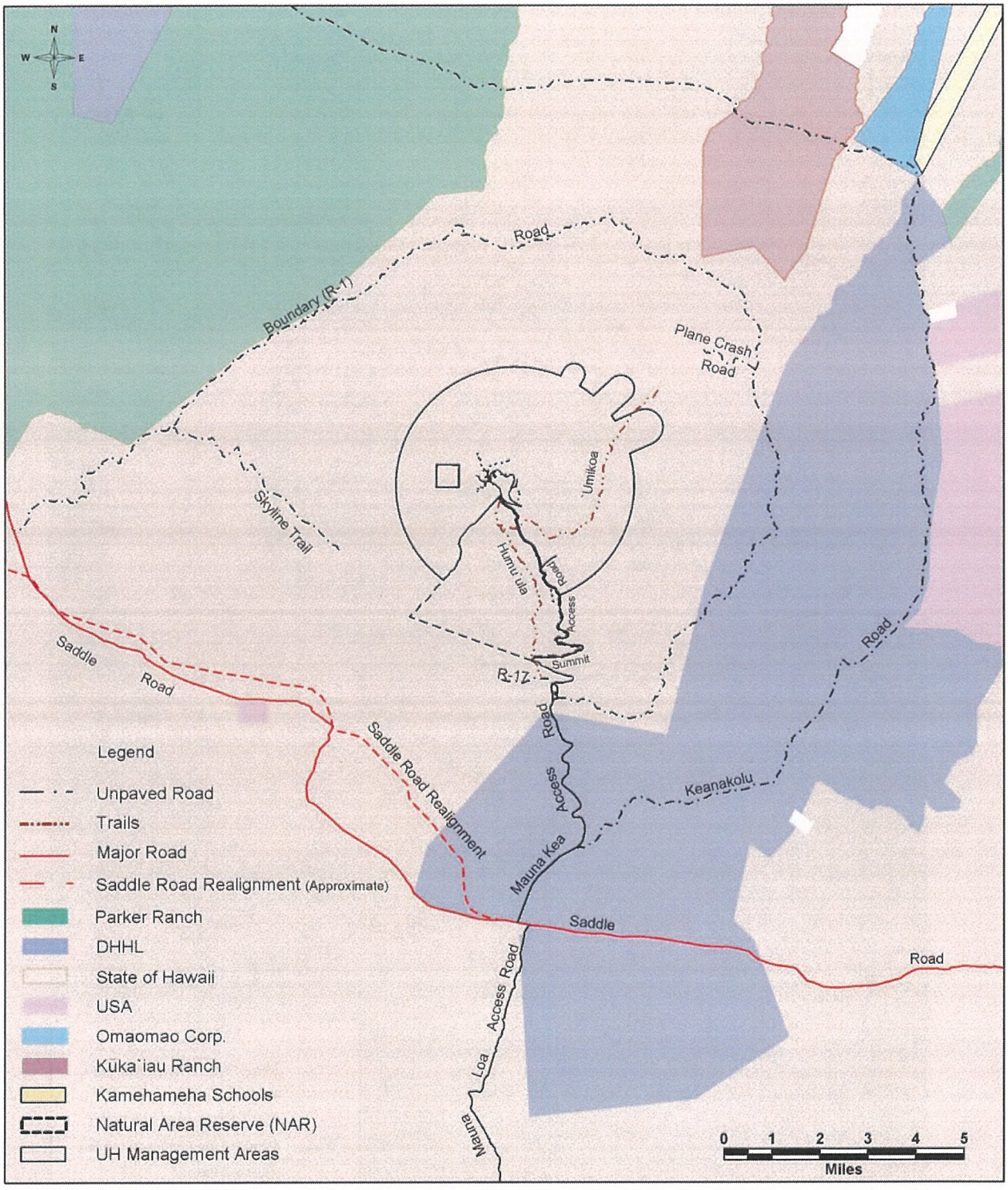


Figure 2-4. Land Ownership/Access Corridor Map

2.3 Management Responsibilities of University of Hawai'i Entities

As the lessee, the University has responsibility for managing the UH Management Areas. The acceptance of the 2000 Master Plan by the UH Board of Regents prompted the creation of three new entities based at the University of Hawai'i at Hilo (UHH): the Office of Mauna Kea Management (OMKM), the Mauna Kea Management Board (MKMB), and Kahu Kū Mauna. These entities operate in conjunction with several advisory committees and the UH Institute for Astronomy (IfA). OMKM established the Mauna Kea Ranger program in 2001. The roles of the various University entities involved in the management of UH Management Areas are outlined in Table 2-1.

Table 2-1. University of Hawai'i Divisions with Responsibility for Mauna Kea

UH Division	Roles and Responsibilities
University of Hawai'i Hilo (UHH) Chancellor	• Oversight of OMKM • Authorized to sign commercial tour use permits[2]
Office of Mauna Kea Management	• Oversees efforts to protect, preserve and enhance the natural, cultural, and recreational resources of Mauna Kea. • Day-to-day management of the cultural and natural resources of the UH Management Areas • Ensure compliance with and implementation of the 2000 Master Plan and the 2009 Mauna Kea CMP • Manages together with Mauna Kea Observatories Support Services (MKSS) the ranger program • Oversees commercial permits • Approves film permits • Coordinates with other stakeholders, both public and private, on issues related to Mauna Kea • Works with other agencies on issues that are related to the mountain but are outside their jurisdiction
Mauna Kea Management Board	• Volunteer board representing the community • Advises UHH Chancellor on activities, operations and land uses planned for Mauna Kea • Has advisory committees (MKMB Environment Committee, the Wēkiu Bug Scientific Committee, the MKMB Hawaiian Culture Committee, and the Public Safety Committee)
Kahu Kū Mauna	• Volunteer council appointed by MKMB • Advises MKMB, OMKM, and the UHH Chancellor on Hawaiian cultural matters affecting the UH Management Areas
Mauna Kea Observatories Support Services	• Funded by and operates under the direction of the observatories through the Mauna Kea Observatories Oversight Committee • Oversees the general maintenance and logistical services to all Mauna Kea observatories and the facilities at Hale Pōhaku (including water hauling, operation of food services and lodging, and fuel supply) • Conducts Summit Access Road maintenance (including weekly grading of unpaved portion of road and snow removal) • Manages the VIS • Manages together with OMKM the ranger program

[2] The University is responsible for the regulation of commercial tour and film activities.

UH Division	Roles and Responsibilities
Mauna Kea Rangers	• On-site management of public health and safety - Distributes safety brochure - Advises visitors of weather conditions, potential hazards associated with ascending the mountain (e.g., altitude sickness, road conditions), and recommended approaches to safely visiting Mauna Kea - Manages road closures for safety reasons - Provides emergency assistance when necessary, including oxygen and water • On-site management of public access - Conducts summit patrols to observe and document activities - Provides information on the unique natural, cultural, and scientific resources; directs visitors to established hiking trails; and educates visitors on prohibited or destructive activities - Monitors commercial tours - Manages visitors on peak use days - Performs site maintenance activities including litter removal and trail maintenance to deter use of non-established trails - Supports other approved activities (e.g. filming, research) to ensure that impacts are minimal - Conducts twice yearly observatory Conservation District Use Permit (CDUP) compliance inspections

The three core responsibilities for the Mauna Kea Rangers, in order, are:

1. Promote health and safety,
2. Protect the cultural, natural and scientific resources of Mauna Kea, and
3. Provide interpretive services to all who travel to Mauna Kea.

These core responsibilities are consistent with widely-agreed upon priorities that are expressed in planning documents, mission and goal statements, as well as the input received from PAP participants. To fulfill these responsibilities, monitoring and management of human activities and the impact they have on Mauna Kea's valued resources is necessary.

2.4 Management Responsibilities of Other Entities in the Summit Region

The State of Hawai'i owns the lands comprising the UH Management Areas on Mauna Kea leased through BLNR to UH. Several divisions within DLNR share responsibility for the State's public lands on Mauna Kea that are within and directly adjacent to the UH Management Areas (see Table 2-2).

Table 2-2. DLNR Divisions with Responsibility for Mauna Kea

DLNR Division	Roles and Responsibilities
Division of Conservation and Resources Enforcement (DOCARE)	• Serves as enforcement arm of DLNR
Division of Forestry and Wildlife (DOFAW)	• Protects and manage watersheds, natural resources, outdoor recreation resources and activities (including hunting), and forest product resources, which occur on State-owned lands • Manages the Mauna Kea Forest Reserve and Game Management Area • Reviews and issues permits for research, collection and access on lands under DOFAW jurisdiction

DLNR Division	Roles and Responsibilities
Natural Area Reserves System (NARS)	• Works to preserve in perpetuity specific land and water areas that support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawai'i • Manages the Mauna Kea Ice Age NAR • Works cooperatively with OMKM on cross-boundary management issues
State Historic Preservation Division (SHPD)	• Carries out the responsibilities outlined in the National Historic Preservation Act to preserve and protect historical and culturally significant properties • Reviews and advises on methods for the conservation of historic properties on Mauna Kea • Investigates complaints and violations of Federal and State historic preservation laws
Office of Conservation and Coastal Lands (OCCL)	• Develops and administers administrative rules for the Conservation District • Regulates and enforces land use for lands in the State's Conservation District • Processes Conservation District land use requests • Monitors all CDUP conditions and investigates complaints and violations • Issues research permits per Conservation District rules[3]

OMKM-NARS Cooperative Agreement. In 2008 OMKM developed a cooperative agreement with DLNR, DOFAW-NARS in order to work more closely on cross-boundary management issues between the UH Management Areas and the Mauna Kea Ice Age NAR. Under the agreement, OMKM provides visitor assistance using OMKM rangers, engages in joint research and educational efforts with NAR staff, and reports violations occurring in the NAR.

Enforcement. Pursuant to Act 226 Session Laws of Hawai'i 1981, DOCARE officers have full police powers and are responsible for enforcing all State laws and rules involving State lands, State Parks, historical sites, forest reserves, aquatic life and wildlife areas, coastal zones and Conservation Districts. The Hawai'i County Police Department (HCPD) also has enforcement authority on Mauna Kea and can enforce both State and County laws. Requests for assistance in the UH Management Areas are handled on a 24-hour/day basis by the Hāmākua Station. Since State and County enforcement personnel do not maintain a regular presence on Mauna Kea, they are usually alerted to potential violations by on-mountain personnel, such as rangers.

Emergency Response. Hawai'i County Fire Department is the primary 911 responder. Frequently PTA Fire Department is asked by the County to assist due to their proximity to the area. In addition, HCPD police officers may be part of any coordinated emergency response.

2.5 Regulatory Environment

The regulatory environment in the Mauna Kea summit region can be confusing to anyone who visits, works, or culturally practices there. Depending on "where your feet fall" you will be subject to different administrative rules, regulations and guidelines, and often it is not obvious whose jurisdiction you are in.

[3] Per the conditions attached to approval of the Mauna Kea CMP, DLNR and BLNR shall consult OMKM, MKMB and/or Kahu Kū Mauna, as appropriate, regarding permit applications for research in the UH Management Areas.

The potentially confusing regulatory environment in the Mauna Kea summit region may lead to conflict and misunderstandings. (Recommendations are made in Sections 6.2, 6.3, 6.5, and 6.6 to promote a coordinated and consistent regulatory approach throughout the summit region).

As shown in Figure 2-3 the UH Management Areas are bordered by State-owned lands that are under the jurisdiction of DLNR. The Mauna Kea Forest Reserve and Game Management Area and the Mauna Kea Ice Age NAR are managed by DOFAW and each of these areas has its own set of administrative rules. Hunting of game mammals and birds is permitted and subject to hunting rules throughout the UH Management Areas (excluding safety zones), the NAR and the Mauna Kea Forest Reserve and Game Management Area. Additionally the State retains authority over the historic trails and any trails existing in 1968 when UH began its Mauna Kea lease with the State. Thus while the University manages the UH Management Areas on Mauna Kea, the lands are also subject to applicable State rules.

2.5.1 Existing Administrative Rules for Lands Adjacent to the UH Management Areas

The lands adjacent to the UH Management Areas are State-owned and regulated by the State under existing State rules. Activities in the Forest Reserves (FR) are regulated under HAR §13-104 and activities within NAR are regulated under HAR §13-209. Hunting is regulated under HAR §13-123 (Game Mammals), HAR §13-122 (Game Birds), and HRS §183D-25.5 (Commercial Hunting Guides). Hunting rules have been established so as not to conflict with other rules applicable to Forest Reserves or NARs in which hunting is permitted. Table 2-3 summarizes key, existing administrative rules that govern public activities in the State lands bordering the UH Management Areas, including the hunting rules that are in effect in the UH Management Areas.

Table 2-3. Selected DLNR Rules Affecting Public Access in Lands Adjacent to the UH Management Areas

Rules	Comments
Hunting ▪ Hunting is permitted in the UH Management Areas (except in safety zones), NAR and FR. ▪ Hunting is permitted: ½ hour before sunrise to ½ hour after sunset ▪ Must obtain a Hunting Guide License from DOFAW to lead commercial hunting tours	Safety zones include any lands within 50 yds of a paved road or a building. Commercial hunting tours are prohibited in the UH Management Areas.
Camping ▪ By permit and in designated areas only in the FR and Hunting rules ▪ Prohibited in the NAR	Camping is clearly defined in the FR rules. If a NAR has visiting hours or closed areas, they will be so designated on posted signs.
Vehicles ▪ Motorized and non-motorized vehicles, horse, mule or other animal allowed only on roads, parking areas or trails designated for that purpose in FR. ▪ Similar rule stated for the NAR, but NAR rules also prohibit air conveyance vehicles and motorized water vehicles where not specifically approved. ▪ Hunting rules restrict motorized vehicles to roads that have been constructed, maintained and opened for vehicular use. Vehicles may be parked within 20 ft of maintained roads.	Hunting rules state that motorized vehicles include, but are not limited to, motorcycles and all-terrain vehicles.

Rules	Comments
Protection of Natural and Historic Resources ▪ Prohibited in a FR: to remove, injure, kill or introduce any form of plant or animal life, unless otherwise authorized by BLNR approved permits or rules. Also prohibited to remove, damage or disturb any natural feature or resource, or historic or prehistoric remains. ▪ Very similar prohibitions in NAR rules ▪ Hunting rules are very detailed about the animals that can be harvested. They also prohibit "removal, damage or disturbance of any objects of antiquity, prehistoric ruins, fossil remains, burial sites, or monuments." ▪ Relevant to Lake Waiau, it is prohibited in the NAR "to enter into, place any vessel or material in or on, or otherwise disturb a lake or pond."	NAR rules also prohibit entering into any cave as defined in HRS §6D-1.
Fires ▪ Prohibited to build any fire on the ground or in any structure or leave a fire unattended without fully extinguishing in FR ▪ Prohibited to start or maintain a fire in NAR ▪ Hunting rules prohibit building any ground fires except where permitted in designated camping areas. Also prohibit discarding lighted cigarettes, cigars, smoking tobacco, or matches, or the igniting of any explosives within or into any public hunting area.	
Alcohol, Narcotics and Drugs ▪ Use or possession of narcotics, drugs or alcohol prohibited in FR. ▪ Use or possession of intoxicating substances prohibited while within a public hunting area.	
Commercial Activity ▪ By Special Use Permit only in FR & NAR	The FR & NAR rules have a definition of "commercial activity."
Animals ▪ Dogs, cats and other animals prohibited in FR unless crated, caged or on a leash at all times, except for hunting dogs permitted by the hunting rules. ▪ Prohibited in the NAR except for dogs as permitted by hunting rules and service animals accompanying their handlers. ▪ Detailed regulations on the use of dogs are contained in hunting rules. Dog's owner or handler must accompany the dog at all times while hunting. Dog's owner is strictly liable for all actions, injuries or damages caused by the owner's dog while in the hunting area.	
Littering ▪ FR rules prohibit draining, dumping, or leaving any litter, animal waste or remains, or unburied body waste that pollutes or is likely to pollute the FR, including pollution of streams and other water sources. No depositing of body waste within 150 ft of a spring, stream, lake or reservoir. ▪ NAR rules prohibit littering or depositing refuse or any other substance. ▪ In hunting rules, no dumping or disposal of any trash and any other waste material except in trash receptacles provided for the purpose of dumping or disposal.	

Rules	Comments
Special Use Permits ▪ FR rules allow for BLNR (or its authorized representative) to approve Special Use Permits for camping, collecting, commercial harvest and access. FR rules contain many details re: permit conditions that may be imposed. ▪ NAR rules contain many details re: permit conditions that may be imposed. Any groups larger than ten individuals are required to have a Special Use Permit. The NARS Commission, in addition to BLNR (or its authorized representative), must approve Special Use Permits in the NAR. ▪ Hunting rules allow for BLNR (or its authorized representative) to issue permits for scientific, educational and propagation purposes. Permits may be required to conduct research on State lands. Permit requirements vary depending on the type and location of the research.	All Special Use Permits are non-transferable.

2.5.2 UH Guidelines and Recommendations for UH Management Areas

UH has not yet promulgated administrative rules for the UH Management Areas. This will change now that the Twenty-Fifth Legislature in 2009 granted "express authority to the University of Hawaii to adopt rules relating to public and commercial activities permitted or occurring on the Mauna Kea lands" (see Section 1.3.2). Until rules are promulgated, the UH Management Areas operate under a set of guidelines and recommendations that appear in written materials for the public and on signs, and are promoted by the rangers and VIS staff. The main source documents for the current public-access related guidelines and recommendations in the UH Management Areas are (1) the lease of June 1968 between UH and the State of Hawai'i and (2) the 2009 Mauna Kea CMP. Table 2-4 identifies the public access-related guidelines and recommendations in these documents that are in effect in the UH Management Areas.

The 1968 lease reserves to the State the right to regulate all hunting and recreation rights on the leased land, but states that those activities will be coordinated with UH and limited to daylight hours only. While public access to the UH Management Areas must be maintained, under the terms of the lease, conditions may be set to avoid activities that unreasonably interfere with the lessee's (UH's) use. Historic sites and "objects of antiquity" are not to be destroyed or altered and introduction of undesirable plant and animal species is to be prevented. Additionally the Mauna Kea-Humu'ula and Mauna Kea-Umikoa Trails and "all other existing trails" are reserved to the State "together with the rights of access over and across said trails."

The BLNR-approved 2009 Mauna Kea CMP superseded the *Revised Management Plan for the UH Management Areas on Mauna Kea*, which was approved by BLNR in March 1995 (DLNR 1995). The CMP incorporates most of the controls from the 1995 Management Plan "to ensure that they continue in full force and effect." Those controls are restated in Section 7.5 of the CMP. UH has authority over commercial tours and filming activities via their permit system but is unable to do more than "guide and recommend" other public user groups until administrative rules for the UH Management Areas are promulgated (see Section 1.3.2).

Table 2-4. BLNR-Approved Public Access Guidelines and Recommendations in the UH Management Areas

Guidelines and Recommendations	2009 CMP	1968 Lease	Comments
Hours at the VIS at Hale Pōhaku ▪ Regular hours are 9:00 AM –10:00 PM ▪ Can vary depending on scheduled events	X		
Hours for Public Recreational Activities in Science Reserve ½ hour before sunrise to ½ hour after sunset	X	X	Can be closed earlier during snow periods to allow clearing of 'stragglers' from high altitude before dark.
Road Closure and Controls between Hale Pōhaku and the Summit ▪ May be closed by UH if hazardous conditions exist ▪ May be controlled by UH and/or DLNR Enforcement Officers as required during periods of heavy usage, certain road maintenance activities, or transportation of heavy equipment ▪ Road will be closed when being cleared of snow and when worked on due to snow conditions ▪ UH may install a gate or chain across road at night	X		UH will keep public informed of road status through local media, recorded telephone message, and links from the VIS and Mauna Kea Weather Center webpages.
Road Reopening after Unscheduled Closing ▪ No private or commercial tour vehicles will be allowed access above Hale Pōhaku until two-lane traffic is established and UH personnel have opened it ▪ Official vehicles shall have priority over private and commercial vehicles in use of the road during and immediately after snow removal and road maintenance activities	X		
4-Wheel Drive Vehicles and Use of Road ▪ Until entire road is paved, all commercial and astronomy-related vehicles must be four-wheel drive ▪ Four-wheel drive (or All-Wheel Drive) strongly recommended for private vehicles ▪ Drivers must obey posted signs and directives given by UH or DLNR personnel. HCPD may be called to assist in event of violation	X		UH reserves the right to require four-wheel drive on all vehicles proceeding to upper elevations when hazardous conditions exist. UH reserves the right to require a waiver of liability from each driver before allowing vehicles to proceed to upper elevations. VIS and ranger programs include All-Wheel Drive vehicles in their recommendations.
Recreational Off-Road Vehicles Prohibited	X		Restriction applies only to public and commercial recreational use and not to use for emergency and medical purposes.
Tours of Telescopes Managed and controlled by UH and other astronomy users	X		Four-wheel drive vehicle required to participate in tour.
Hunting ▪ Allowed only in areas designated for that purpose by DLNR and subject to DLNR regulations ▪ Commercial hunting tours are prohibited in the UH Management Areas	X	X	Safety zones (where hunting is prohibited) include any lands within 50 yds of a paved road or a building.

2.5.3 Controls on Commercial Activities in the UH Management Areas

Commercial activities are managed by UH. On Dec. 15, 2000, BLNR approved the transfer of the commercial tour permitting function to UH. UH Board of Regents accepted the transfer of responsibility in January 2005, and in January 2007 the first permits were issued by UH.

Commercial tours involve transporting passengers in authorized vehicles to and from Mauna Kea by a commercial entity holding a permit for the purposes of viewing, walking and touring the premises, including sightseeing and stargazing (see Section 3.3.3). Conditions for commercial tours are set forth in the UH OMKM Mauna Kea Commercial Tour Use Permit Requirements. The permit clearly explains applicable fees, required security deposit and insurance, conditions for revocation of a permit, duties of caring for public safety, compliance with existing regulations, and general rules to be observed while on University leased lands. Permittees must comply with all of the conditions specified or the permit may be revoked and fines imposed. During times of heavy use, the University and DLNR reserve the right to limit the number of commercial vehicles allowed on the mountain at one time. Currently this limit is set at 18 fourteen-passenger vans. Permits are reviewed and issued yearly by OMKM. Table 2-5 identifies controls by UH on commercial tours and users.

Table 2-5. Current Commercial Activity Controls in the UH Management Areas

Allowed Activity	Stated Restrictions	Conditions
Commercial Tours	All commercial operators must obtain a permit that requires compliance with relevant restrictions and controls.	Commercial tours will be monitored to determine if the number of operators at the summit at one time or total number of permits issued should be limited. Commercial permits shall be set for a term and subject to renewal. Permits will have a consistent fee basis.
Hiking/ Bird Watching/ Nature Study	All commercial operators must obtain a permit that requires compliance with relevant restrictions and controls.	Activity involves paid guide and commercial transport.
Sight-seeing/ Photography and Picnicking	All commercial operators must obtain a permit that requires compliance with relevant restrictions and controls.	Includes tours that stop at VIS and continue up the mountain but do not enter buildings at summit.
Daytime Tours of Facilities	All commercial operators must obtain a permit that requires compliance with relevant restrictions and controls.	Granted on case-by-case basis with permission from University and facilities.
Night time Activities at Hale Pōhaku	All commercial operators must obtain a permit that requires compliance with relevant restrictions and controls. - At any given time, each operator is allowed a maximum of two Standard Vehicles or one Modified Vehicle in the VIS parking lot. - Tour vehicles must park only in authorized parking areas.	Granted on case-by-case basis with permission from University or MKSS.

Allowed Activity	Stated Restrictions	Conditions
Film Making	All requests for film making must obtain a State Film Office permit that shall be reviewed and approved by OMKM. All film permittees must comply with relevant restrictions and control.	Granted on case-by-case basis with permission from the University. Film purpose must be in keeping with the goals and objectives of the 2000 Master Plan (i.e., it must convey Mauna Kea in a dignified manner or be educational in scope).
Concessions at University Facilities	Permitted by University IfA or MKSS at VIS or other facilities.	
Shuttle Service to Summit	Permitted by University IfA or MKSS at VIS or other facilities.[4]	
Snow Tours: Downhill Skiing, Snowplay, Sledding, Cross-country Skiing	Commercial snow tours not permitted.	
Ski Meets, Races and other Snow-Play Events	Commercial ski meeting, races, and snow play events not permitted.	

2.5.4 DLNR Policy for Commercial Activities on State Owned and Managed Lands and Waters

Approved by BLNR on January 30, 1998, the DLNR "Policy for Commercial Activities" provides guidance to BLNR when it considers commercial activity proposals or management actions on State owned lands and waters (see full policy statement in Appendix F). Although referred to as a single policy, this policy is actually comprised of seven policies. DLNR staff, including OCCL and NAR, have emphasized the need for UH to acknowledge and use this policy in the Public Access Plan. UH assumed responsibility for commercial tour permitting in January 2007. DLNR's commercial policies should be considered in the process of promulgating administrative rules to regulate commercial activities on the Mauna Kea lands, as authorized by Act 132 (2009).

When BLNR adopted these policies, it acknowledged that diversity of resources and funding constraints will affect implementation. It also expressed the expectation that "relevant commercial activity proposals" brought before the Board for approval "will have considered these commercial activity policies."

To summarize the seven policies:

1) When considering commercial activity proposals or management actions on State-owned lands and waters, a "hierarchy of priorities" will be followed;
2) The principles of *Limits of Acceptable Change* should be used to monitor and manage intensities of use;
3) Any new permits for commercial activity should contain conditions that allow DLNR to change levels or terminate certain activities based upon stated limits of acceptable change;

[4] None currently in operation.

4) The managing agency has the lead responsibility to coordinate the application review process, and any environmental documentation required will be the applicant's responsibility;
5) The managing agency can issue activity permits for routine activities and not for profit organizations without Board approval (excepting permits for "very significant activities and/or those requesting multiple years");
6) Reasonable fees for commercial users should be assessed based on either a percentage of gross revenues, per user, or expected impacts of their activity (not for profit groups that charge fees only to cover administrative costs can be exempted from fees); and
7) DLNR will compile a list of eligible sites for commercial activity and note the intensity of commercial activity that will be permitted. The list will be periodically reviewed and updated.

Included in the policy statement are important definitions that help to clarify the meaning and intent of the policies. The "hierarchy of priorities" described in Policy #1 is the keystone from which all the other policies follow:

a) The highest priority should be the conservation of natural or cultural resources. "Only if an activity can be done in a way that does not unduly damage the resource, should it be allowed."
b) If use or activity by the public can be done without undue damage to the resource, it should be the next priority.
c) Commercial activities should be considered only if their impacts do not impinge on the natural and cultural resources or use or activity by the general public. Further, if public and commercial activities are occurring and resource impacts indicate that restrictions or controls are necessary, those should first be levied on commercial operators. The general public is the last group to have restrictions and controls imposed on them.

Policies #2 through #7 are operational guidelines that identify how managing agencies are to process commercial permit applications; some of the conditions that should be standard in the permits; as well as how impacts on the resources are to be monitored. *Limits of Acceptable Change* (LAC) are specifically mentioned as the methodology that "should" be used for assessing impacts to the resources. LAC has been extensively used by natural and recreation resource managers worldwide for a few decades, and it compares favorably with other management methods in research studies (Moore et al. 2003). Like many of the management frameworks in use today it provides a systematic process by which to monitor and assess the impacts of human activity on resources to inform and improve management actions.[5]

2.6 Infrastructure

Infrastructure, in the form of buildings, roads, and utility lines, supports visitor use and observatories on Mauna Kea, both in the summit region and at Hale Pōhaku. The extent and installation of these facilities is described in detail elsewhere (e.g., construction documents, environmental impact statements). This discussion is limited to infrastructure as it relates to public access.

2.6.1 Improved Roads

The primary access to the summit of Mauna Kea is from the Saddle Road that connects both sides of Hawai'i Island. The Saddle Road is undergoing significant improvements, which should result in a major

[5] The Mauna Kea CMP recommends use of the "Adaptive Management" process, which bears much similarity to the *Limits of Acceptable Change*. See discussion on adaptive management in Section 6.4.

cross-island highway when the final section is connected to the Mamalahoa Highway near the Waikoloa junction, estimated to be complete in 2013. Saddle Road use estimates provided in the Saddle Road EIS indicate average daily traffic of 1,400 vehicles on the Saddle Road in 2008 (Ron Terry, pers comm. 2009).

Summit Access Road named after former governor John A Burns

The Mauna Kea Access Road leads from the Saddle Road to Hale Pōhaku and the Visitor Information Station at 9,200 ft. The road is paved for approximately six miles to Hale Pōhaku. It continues as the Summit Access Road (a.k.a. John A. Burns Way) from Hale Pōhaku to the summit. The next approximately 4.6 miles of the road is gravel with drainage culverts but no guard rails. Above 11,820 ft, the road is paved to the summit. Most roads within the Astronomy Precinct have been paved to minimize the impact of dust on sensitive equipment and to provide an all weather surface for access and operations.

There are three public parking areas along the Summit Access Road at ~11,880 ft (paved with 12 lined spaces), at ~12,800 ft (paved with 22 lined spaces), and at ~13,240 ft (unpaved with three levels for a total of ~80 parking spaces). After sunset the smaller, paved parking areas are used by commercial tours and amateur astronomers for stargazing. These parking areas are depicted on the map included in a safety brochure available at the VIS, but are not identified by signage on-site. The parking areas are essential when large numbers of people are drawn to Mauna Kea to play in the snow.

The road above Hale Pōhaku is maintained by Mauna Kea Observatories Support Services (MKSS), which is responsible for grading the unpaved portion of the road about two to three times per week and clearing the road and parking areas of snow. The road requires regular grading because of the "washboard effect" from daily vehicular use.

2.6.2 Public Facilities and the Visitor Information Station (VIS)

Public facilities in the UH Management Areas include parking, restrooms, portable toilets (close to the summit and at the highest parking lot), trash receptacles, outdoor picnic tables, educational exhibits, and a bookstore with limited convenience food. Except for the portable toilets and parking, all of these amenities are located at the VIS, which is the only facility open to the public in the complex of buildings on the Hale Pōhaku parcel.

Hale Pōhaku and the VIS at 9,200 ft

The VIS at Hale Pōhaku is open daily from 9 am to 10 pm to provide information and activities free of charge to both daytime visitors and nighttime stargazers. The VIS provides educational displays and videos, and information on safety and hazards, astronomy, the observatories, and natural and cultural resources. Interpretive guides and volunteers are on-hand at the VIS and lead tours to the summit on the weekends for people who provide their own four-wheel drive vehicles. The rangers are also frequently at the VIS helping to inform and educate the public. Signs on the outside of the VIS describe dangers associated with traveling to the summit, and displays inside provide information about the observatories, geological resources and the wēkiu bug.

The VIS runs an active volunteer program with 191 volunteers contributing a total of 10,708 hours during the most recent Fiscal Year ending in June 2009. 104 of the volunteers were university students, but in terms of volunteer hours, 66 community members contributed slightly more volunteer hours than the students.[6] Volunteers are trained to do many of the same duties as full staff members, and it is not unusual for volunteers to be hired by the VIS or the observatories after gaining experience.

[6] "Volunteer Activity Report – Fiscal Year 2008-2009", Onizuka Center for International Astronomy Visitor Information Station.

Visitors watching video at the VIS

The VIS offers an evening stargazing program every night from 6 – 10 pm with telescopes available for use by adults and children, and tours of the night sky given by knowledgeable volunteers. A portion of the parking area (four spaces) is blocked off where five of the ten telescopes are placed for public viewing. Other VIS events include monthly Saturday evening programs with guest speakers on a variety of topics including the latest astronomical research and discoveries, as well as Native Hawaiian cultural aspects of Mauna Kea. The VIS website (http://www.ifa.hawaii.edu/info/vis/) provides information for those planning a visit, including weather and road conditions, safety information, names of tour companies, VIS-sponsored events, and links to related information about Mauna Kea. The Mauna Kea Weather Center (http://mkwc.ifa.hawaii.edu) is another up-to-date source of information on road status and weather conditions and forecasts. Near the VIS there is also a 0.74 acre exclosure managed by DLNR supporting research into silversword and māmane forest restoration, which was established in 1972.

2.6.3 Trails and Unimproved Roads

Trails in the UH Management Areas fall into two broad categories: historic Hawaiian trails and social trails.[7] Figure 2-4 shows historic trails and some of the hunting roads that are in use today in the UH Management Areas and adjacent lands. Not all of the social trails are depicted on the map, because some of them are environmentally damaging and should be re-naturalized. Information on the current use levels of historic and social trails is in Section 3.3.7.

[7] Social trails are trails that are informally created when people or animals choose the shortest or most easily navigated route to their desired destination. Also called "desire paths," these trails are often shortcuts and can become well-established over time. They can also be problematic if subject to erosion or environmentally damaging in other ways.

Historic Hawaiian Trails

There are two historic Hawaiian trails that lead to the summit region and are referred to by name in historic maps and the 1968 lease between UH and the State: the Mauna Kea–Humu'ula Trail (a.k.a. Kalai'eha-Waiau Trail) and the Mauna Kea–'Umikoa Trail (a.k.a. 'Umikoa-Ka'ula Trail) (see Figure 2-4). Additional trails to the summit region are specifically mentioned in oral history interviews: the Laupāhoehoe–Waipunalei–Kanakaleonui to Mauna Kea Trail, the Makahālau–Kemole to Waiau Trail and the Waiki'i–Pu'u Lā'au to Waiau Trail (Maly and Maly 2005). Native oral tradition and early historic accounts describe cross-island expeditions and political events such as historic battles, customary quarrying, resource gathering and religious practices, using extensive trail networks that led from Hilo, Hāmākua, Kohala, Kona and Ka'ū Districts to Mauna Kea and beyond. Knowing how early Hawaiians relied upon trails as their only means of overland transportation, more than two historic trail routes are thought to exist in the summit region. Archaeological inventory surveys recently completed by Pacific Consulting Services, Inc. (Patrick C. McCoy, et. al.) will be analyzing the locations of historic sites and *'ahu* to see if any pattern emerges that may indicate the presence of more historic trails.[8]

Historic Humu'ula Trail marker

Portions of the Mauna Kea–Humu'ula Trail, a Highways Act of 1892 trail (see Section 1.5), are used today on a regular basis. It is identified by several trail signs across the road from the utilities baseyard at Hale Pōhaku and enters the NAR, continuing to Lake Waiau and into the Science Reserve. Before the trail reaches Lake Waiau, it intersects the Mauna Kea–'Umikoa Trail, which is clearly shown on historic maps[9] but difficult to locate on the ground today. The Mauna Kea–'Umikoa Trail does not appear on maps until the early 1900s but may have been an ancient trail that was not identified or mapped until later (see CRMP Section 2.2.4). The trail that begins near the parking area at 12,800 ft may have formerly been a section of the historic Mauna Kea–'Umikoa Trail.

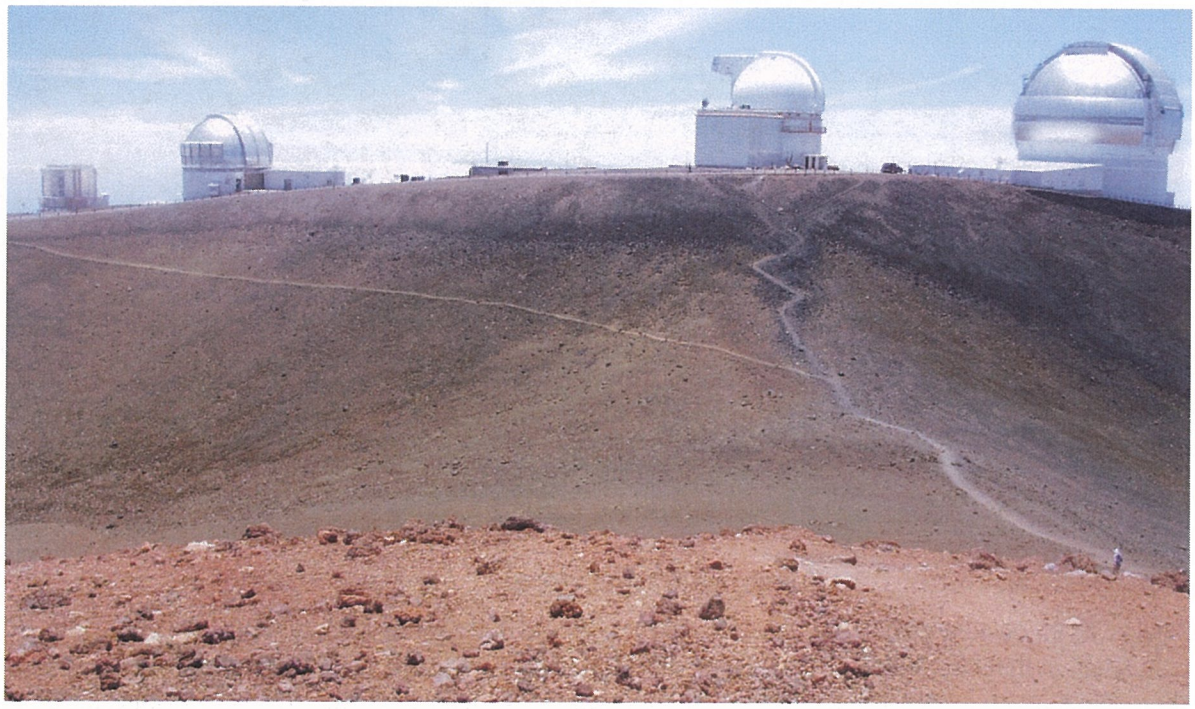
Social Trails

Social trails are being used by the public today within and adjacent to the UH Management Areas. The most intensively used are on Pu'u Wēkiu (in the UH Management Areas), and on Pu'u Kalepeamoa and an unnamed *pu'u* adjacent and north of Pu'u Kalepeamoa (outside of the UH Management Areas). The

[8] For more detailed information about the historic Hawaiian trails, see CRMP Section 2.2.4 and *Mauna Kea-Ka Piko Kaulana o Ka 'Āina* (Maly and Maly 2005).

[9] J.O. Kilmartin (1925-26) and Walter E. Wall (1928)

top of Pu'u Wēkiu is the summit of Mauna Kea and as such is the most sacred part of Mauna Kea. Ancient Hawaiians did not traditionally go to the summit, considering it *kapu* (sacred) and the domain of the gods. Only the highest priests had reason to be in this area, which may be why there were no well-established trails to the summit until recently. The trail to the top of Pu'u Wēkiu has become the most used hiking trail in the UH Management Areas, but it is poorly placed and vulnerable to erosion. It is also problematic that another trail is becoming established that continues around the crater rim, adding to the disturbance of the loose cinder at the highest, most sacred point of Hawai'i.



Proliferating trail options on Pu'u Wēkiu

While the social trails on Pu'u Wēkiu are located completely within the UH Management Areas, the trails that lead to the top of Pu'u Kalepeamoa and an unnamed *pu'u* adjacent and north of Pu'u Kalepeamoa begin in the UH Management Areas across the road from the VIS and extend into the FR and GMA under DLNRs jurisdiction.

Unimproved Roads

Unimproved roads include roads that are off-shoots of the Summit Access Road in the Science Reserve and roads primarily used by hunters that lead into the Mauna Kea FR and GMA lands. The Boundary Road (a.k.a. "R-1") is completely outside of the UH Management Areas and begins at about 9,000 ft just below Halè Pōhaku and continues around the mountain eventually joining the Saddle Road at the hunter check-in station at Kilohana (5,640 ft) west of Pōhakuloa Training Camp (see Figure 2-4). ATVs are permitted on the Boundary Road and Skyline Trail. Although there are instances when off-road vehicles leave the roads approved for their use, this unauthorized use does not appear to be entering the UH Management Areas. DOFAW is aware of the problem and working to resolve it. Hunters are known to be hiking into the Science Reserve from the Boundary Road, but this seems to be an infrequent activity as it is a strenuous, physically demanding undertaking. Hunting roads are given "R" numbers and R-17 is the

only hunting road that begins in the UH Management Areas. It coincides with the Mauna Kea–Humu'ula Trail for a short distance before the trail branches off R-17 on its way to Lake Waiau.

Trail on Pu'u Kalepeamoa in the Forest Reserve near the VIS

2.7 Natural, Cultural and Scientific Resources

Mauna Kea contains unique natural, cultural and scientific resources and is probably one of the most significant cultural and astronomical sites in the world (see Table 2-6). Public access plans must consider the rights of Native Hawaiians and the public to use the area for cultural practices, recreational purposes and the enjoyment and study of the natural, cultural and historic components. Public use of the area is subject to rules and regulations that are aimed at protecting these resources from damage and the terms of the lease providing for scientific use.

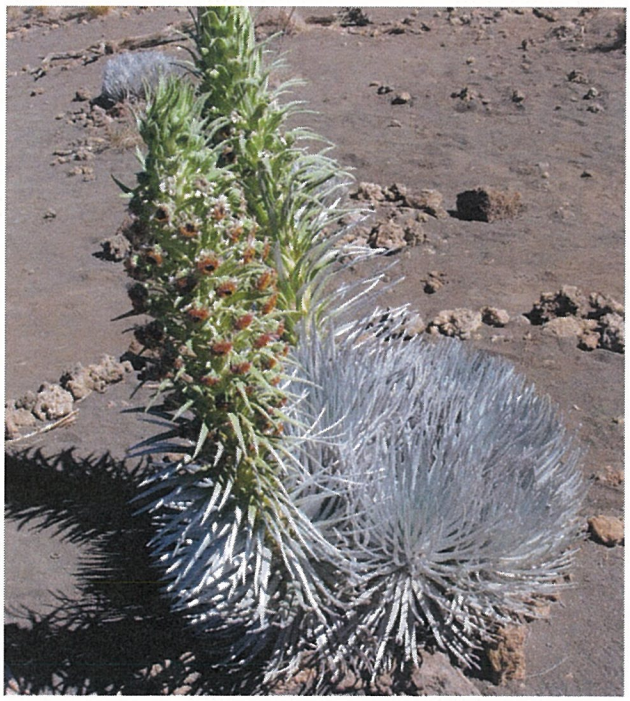
2.7.1 Natural Resources[10]

Rising 30,000 ft above the sea floor, Mauna Kea is the highest insular volcano in the world (NPS 1994). It is home to numerous unique geologic features and a truly awe inspiring natural environment. Seemingly barren, desolate, and unchanging, the natural environment of the upper slopes and summit area are actually very much alive, revealing through its topography, geology, and climate an impressive history of geomorphic process and ecosystem development. The upper elevations of Mauna Kea contain numerous natural resources many of which are considered unique, endemic, rare or endangered. Some of the more unique geological features of the high elevation area include Lake Waiau – the only high elevation lake in the state; a large number of cinder cones; and large pillow lavas, gas spiracles (openings formed by explosive disruption of fluid lava by gas), and hyaloclastic deposits (quenched glass) that are evidence of lava-ice contact during sub-glacial eruptive events. In recognition of these features, in

[10] See Mauna Kea CMP Section 5.5 and NRMP Section 2 for more details.

November 1972 Mauna Kea was placed on the National Registry of Natural Landmarks, a program administered by the National Park Service (NPS 1994).[11]

The formation of cinder cones, the movement of ice sheets, and the interaction of lava and ice has shaped much of the summit area. Mauna Kea formed through the accumulation of large volumes of lava from a series of volcanic eruptions. The morphology of the upper flanks and summit area of Mauna Kea was subsequently altered by the post-shield eruptions of the Hāmākua and Laupāhoehoe Volcanics. Explosive eruptions that deposited tephra[12] more or less symmetrically around the vents were typical of this volcanic period and formed the *pu'u* that dot the landscape. This period of volcanism also coincided with the presence of glaciers on the upper mountain. Evidence of glacial events includes till and moraines, glacially polished rock surfaces, lava-ice contact zones, and hydrologic features such as Pōhakuloa Gulch. When ejected lavas met the glacial ice, they were cooled immediately, creating an explosive eruption called a pyroclastic event. Products of these events included extremely fine particles (tuff) and ash. The combination of these factors resulted in the unique and varied geomorphic features of Mauna Kea, none of which would have been formed had the glaciers not been present.



Mauna Kea Silversword
(*Argyroxiphium sandwicense sandwicense*)

The biological communities found on Mauna Kea are also unique and more diverse than they appear. A number of protected species occur in the summit area including the Federally Endangered Mauna Kea silversword (*Argyroxiphium sandwicense sandwicense*) and the wēkiu bug (*Nysius wekiucola*), a Federal Candidate for listing. There are at least 31 Federal and State Endangered, Threatened, Candidate and Species of Concern found, or potentially occurring in the UH Management Areas. High elevation areas on Mauna Kea, such as those found at Hale Pōhaku and the Science Reserve, can be divided into two basic types: the subalpine ecosystem (5,600 ft to 9,800 ft), and the alpine ecosystem (above 9,800 ft) (Gagné and Cuddihy 1990). Hale Pōhaku occurs in the upper reaches of the subalpine ecosystem, while the Science Reserve occurs in the alpine ecosystem.

[11] The landmarks registered under this program are not intended for acquisition by the federal government, but rather, voluntary maintenance and preservation is encouraged. This designation is given to sites thought to best exemplify the geological and ecological history of the United States. The program goal is that acknowledgment of these areas may increase public appreciation for the natural heritage of the United States.

[12] Tephra refers to fragments of volcanic rock and lava, regardless of size, that are blasted into the air by explosions or carried upward by hot gases in eruption columns or lava fountains. Tephra includes large dense blocks and bombs, and small light rock debris that have usually solidified prior to hitting the ground.

The subalpine zone contains dwindling māmane (*Sophora chrysophylla*) woodlands that provide habitat for the Hawaiian hoary bat (*Lasiurus cinereus semotus*) and the Palila bird (*Loxioides bailleui*), both Federally-listed Endangered species. Māmane woodlands once stretched from sea level on the leeward side of Mauna Kea to the tree line at 9,500 ft, but have been gradually reduced due to habitat alteration. Invasive species are prevalent in this zone. Invasive predators, such as cats, rats, barn owls, and mongoose impact native bird populations by preying on the birds and their eggs. Grazing by feral sheep, mouflon sheep and goats decreases populations of native plants and encourages non-native invasive plants to spread.

The summit of Mauna Kea (12,800 to 13,796 ft) is considered an Alpine Stone Desert (Mueller-Dombois and Fosberg 1998). This plant community consists of several species of mosses and lichens, an unknown number of species of algae, and a limited number of vascular plants (Hartt and Neal 1940; Char 1999; Aldrich 2005). Most of the species of plants found in the region are endemic (occurring only in Hawai'i) or indigenous (native to Hawai'i but occurring elsewhere). A few non-native plant species have also become established at the summit, including several new invasive species that are spreading via the Summit Access Road (Hartt and Neal 1940; Char 1999).

The greatest threats to the natural resources found on Mauna Kea include habitat alteration and loss, introduction and spread of invasive species, and climate change. Habitat alteration and loss can occur through development, trampling and off-road vehicle use, and spread of non-native plant species. Cinder crushing directly impacts the wēkiu bugs and other native invertebrates that live on the summit by removing usable habitat. Invasive species that become established and spread on Mauna Kea can impact native species through competition and predation (including herbivory by invasive sheep and goats). Invasive ants such as the Argentine ant are one potential pest with the ability to severely impact native invertebrate communities, including those at the summit and Hale Pōhaku. The Argentine ant has already become established in high elevation areas on Haleakala on Maui, and is spreading on Mauna Kea. It is not yet found at Hale Pōhaku, and its introduction and spread should be prevented, in part through proper disposal of food items brought on to the mountain and through educational outreach. Invasive plants are spreading up the mountain, both by windblown seed, and by seeds brought in on car tires and hiker's boots and equipment. This can be easily observed by the way many invasive plants, such as common mullein, line the roadways up the mountain. The prevention and control of threats to the natural resources in UH Management Areas are discussed at length in the Section 4.2 of the NRMP. Elements of that plan that involve access (e.g. reducing cinder crushing by prohibiting creation of new hiking trails) are also discussed in this plan.

2.7.2 Cultural Resources and Practices[13]

A complete picture of traditional cultural practices that historically occurred on Mauna Kea is difficult to fully ascertain. It is known however that Mauna Kea has long been regarded by many Native Hawaiians as the most sacred place on the island, and that it has been, and continues to be used as a place to conduct traditional and customary practices. Cultural and religious practices associated with the mountain include prayer, burial, and other rituals, and construction of small shrines. There is clear evidence that resource extraction, including quarrying stone for adzes and bird gathering historically occurred on Mauna Kea. Oral and written histories have numerous references to human burials, the deposition of *piko* (the

[13] See Mauna Kea CMP Section 5.2 and CRMP Section 2.3 for more details.

umbilical cord) and the presence of *'ahu* on Mauna Kea. Physical evidence of human burials and *'ahu* are present today and modern Native Hawaiians still frequent the mountain for the deposition of *piko*, to scatter the ashes of deceased relatives and to engage in prayer or visit shrines.

Upright stone shrines are the most numerous archaeological site in the summit region

2.7.3 Historical and Archeological Sites[14]

The Mauna Kea summit *pu'u*, listed by the State as a historic property, and the State Mauna Kea Summit Region Historic District (including the Mauna Kea Ice Age NAR and its Mauna Kea Adze Quarry, a National Historic Landmark listed in 1962) are eligible for listing on the National Historic Register.

There are hundreds of archaeological sites including traditional cultural properties, shrines, and burials and possible burials; stone tool quarry/workshop complexes; adze quarry ritual center; isolated adze manufacturing "workshops"; isolated artifacts; stone markers/memorials; temporary shelters; and historic campsites within the Science Reserve and Mauna Kea Ice Age NAR. An inventory survey of the UH Management Areas begun in 2005 was completed in October 2009. There are over 200 historic properties in the UH Management Areas (see Figure 2-5) (McCoy et al. 2009). In addition to work in the Science Reserve, an inventory survey in the adjacent Mauna Kea Ice Age NAR was completed in September 2009.

[14] See Mauna Kea CMP Section 5.4 and CRMP Section 2.4 for more details.

Table 2-6. Cultural and Natural Resources of Mauna Kea[15]

Cultural Resources	Natural Resources
Archaeological and Historic Sites - Shrines - Burials and possible burials - Adze and stone tool workshop complexes - Isolated artifacts - Stone markers and memorials - Trail systems	**Biotic**[16] *Flora* - Plants and plant communities (e.g., Mauna Kea silversword*, māmane woodland) - Algae and Fungi - Lichens - Mosses *Fauna* - Invertebrates (e.g., Wēkiu bug*) - Birds (e.g., Palila*) - Mammals (Hawaiian hoary bat*)
Traditional Cultural Practices *Traditional and customary practices* - Belief in the upper mountain region of Mauna Kea, including the Science Reserve, as a sacred landscape - Access to Mauna Kea to exercise religious and spiritual observances - Performance of prayer and ritual observances - Access to Lake Waiau for religious, spiritual, and cultural practice† - Collection of water from Lake Waiau for a variety of healing and other ritual uses† - Use of the summit region as a repository for human burial remains - Scattering of ashes of individuals with a lineal connection to Mauna Kea - Traditional gathering (e.g., ʻōhelo berries, māmaki, mountain koʻokoʻolau) - Access through trails for subsistence hunting - Viewplanes *Contemporary cultural practices* - Prayer and ritual observances - Construction of new altars - Gathering snow for ceremony elsewhere	**Physical**[17] *Geology* - Lava (hawaiites, basalts) - Geologic features (cinder cones, pit crater) - Glacial features (glacially polished rock surfaces, lava-ice contact zones, glacial till and moraines, self-sorted stone stripes) *Hydrology* - Groundwater - Aquifers - Lake Waiau† - Lower elevation seeps and springs *Meteorology / Climate* *Air* *Noise* *Viewplanes*
Traditional Cultural Properties - The summit (Kūkahauʻula) - Puʻu Līlīnoe - Lake Waiau†	**Ecosystem Function** - Subalpine community - Alpine community - Aeolian ecosystem[18]

[15] Cultural and natural resources of the summit region marked with a "†" are solely within the boundaries of the Mauna Kea Ice Age NAR, which is adjacent to and partly surrounded by the Science Reserve.

[16] Species marked with an asterisk are listed or are candidates for listing under the Endangered Species Act. These are only a subset of the species found on Mauna Kea.

[17] Physical resources include both those that have actual structure, and things that have properties that can be affected by human activity [e.g. climate, air quality, noise levels, viewplanes (what is seen looking to and from the summit region)].

[18] Ecosystem that is dependent, to a high degree, on transport of food and other materials from another location by the wind.

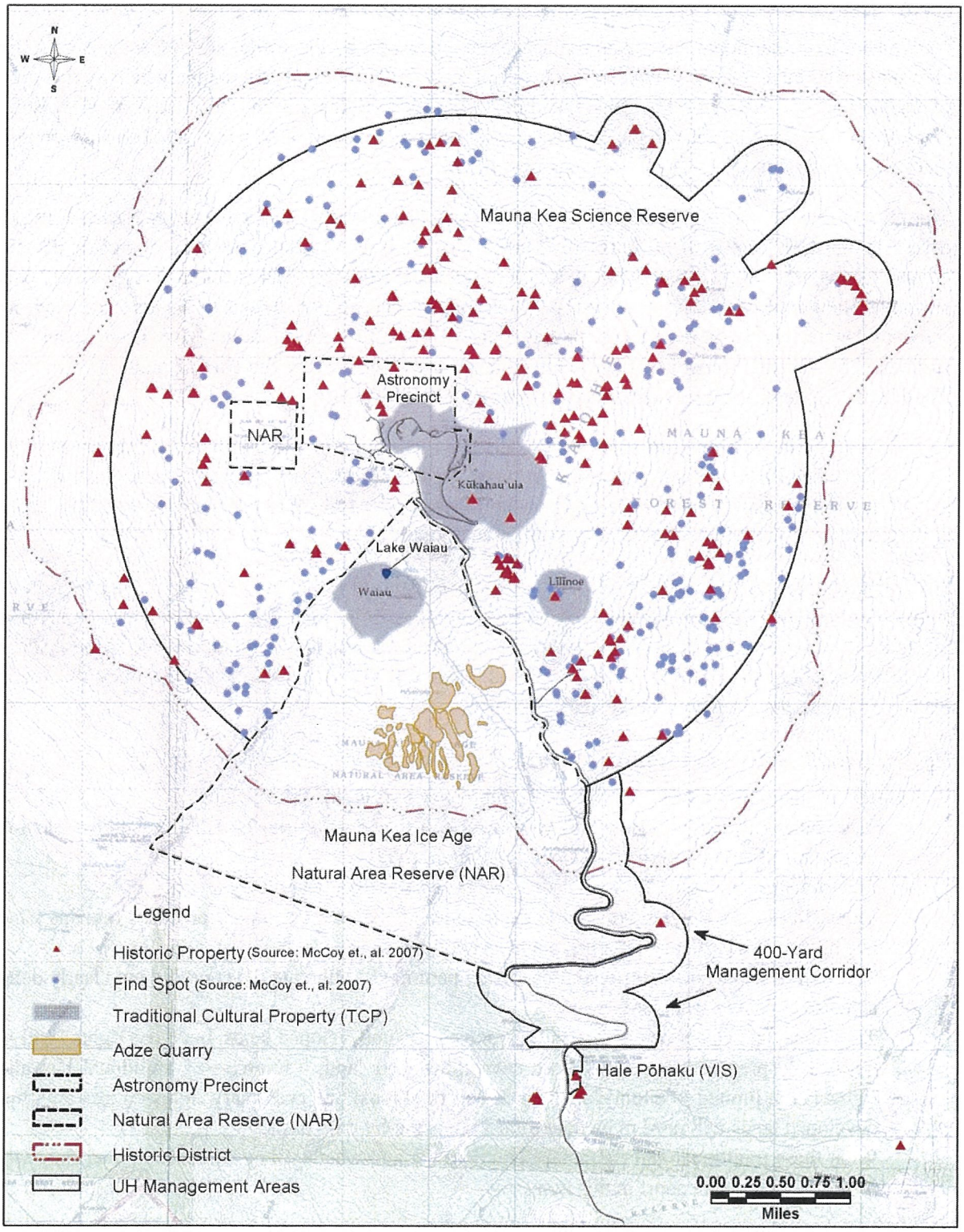


Figure 2-5. Historic Properties, Traditional Cultural Properties, and Find Spots

2.7.4 Native Hawaiian Traditional and Customary Rights

Native Hawaiian traditional and customary rights are possessed by those who are descendants of Native Hawaiians who inhabited the Hawaiian Islands prior to 1778. These rights are uniquely held by this group of people and not shared by the general public. What those rights are and how they are exercised is determined on a case-by-case basis, as there are no definitions that apply across all situations or in all places. Customary practices can also change over time.

The following summary highlights key aspects of laws that are especially relevant to Native Hawaiian access in the UH Management Areas on Mauna Kea. It is not intended to be a complete list or a comprehensive review of the laws. By inclusion of this legal summary, UH is acknowledging that Native Hawaiian traditional and customary rights, which include but are not limited to access, gathering, and religious rights, are fully recognized in the State of Hawai'i's constitution; have been upheld and reaffirmed by several, recent court decisions; and must be protected by State and County governments. The *Hawai'i State Constitution Article XII - Section 7 (1978)* states:

> "The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights."

According to case law, the State and Counties may reasonably regulate the exercise of Native Hawaiian rights. The *"PASH"* case (see below) did however emphasize that the State does not have "unfettered discretion to regulate the rights of ahupua'a tenants out of existence." Regulation needs to be justified, and the most compelling reason for regulation is when it is in the interest of the health and safety of Native Hawaiian practitioners and the general public.

Public Access Shoreline Hawaii (PASH) v. Hawaii County Planning Commission (1995)[19]

Key aspects of the rulings made by the Hawai'i Supreme Court in this case include:

- Descendants of Native Hawaiians who inhabited the islands prior to 1778, regardless of blood quantum, are entitled to traditional and customary rights.
- Practitioners can claim rights to access *ahupua'a* other than where they reside.
- The right of each *ahupua'a* tenant to exercise traditional and customary practices remains intact, even if use of a particular area has not been continuous.
- "Unreasonable or non-traditional uses are not permitted," although the court did not clearly define a "reasonableness" standard.
- Traditional and customary access is "guaranteed" on undeveloped lands, but those rights "will not necessarily prevent landowners from developing their lands." Exercise of traditional Hawaiian rights is not limited to undeveloped lands, but traditional and customary rights on less than fully developed lands will need to be determined on a case-by-case basis.
- What these traditional and customary practices are and whether they can change over time were not addressed by the court in this case.

[19] Sources: "An Outline of the PASH/KOHANAIKI Decision" by Attorney Denise E. Antolini, 1997 and "Land Titles, Local Style" by Attorney James K. Mee, Ashford & Wriston, 2007.

- All State and County agencies must give traditional and customary rights "full consideration" and "preserve and protect" such rights "to the extent feasible" whenever permits are issued that may infringe on those rights.

State v. Hanapi (1998)[20]

In this case the Hawai'i Supreme Court stated that "there must be an adequate foundation....connecting the claimed right to a firmly rooted traditional or customary native Hawaiian practice." To do this, expert testimony or testimony from a "*kama'aina* witness" (someone who is knowledgeable in the geographic area from childhood) can be used.

Ka Pa'akai O Ka 'Āina v. Land Use Commission (2000)[21]

The Hawai'i Supreme Court emphasized in this case that the State and its agencies have an "affirmative duty to preserve and protect traditional and customary native Hawaiian rights" to the extent feasible under Article XII, Section 7 of the Hawai'i State Constitution. Before taking action, government agencies must make specific findings and conclusions regarding: (1) the identity and scope of traditional and customary Native Hawaiian rights and the extent to which they are exercised in the affected area; (2) the extent to which traditional and customary Native Hawaiian rights will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken by the agency to reasonably protect Native Hawaiian rights if they are found to exist. Further, this analysis should be applied before an action is approved and begun, and the analysis should be completed by the State and not delegated by the State to the entity applying for approval.

2.7.5 Scientific Resources

The summit of Mauna Kea hosts the world's largest ground-based astronomical observing site, considered to be the finest in the world. Physical characteristics that set Mauna Kea apart from other sites include: high altitude, atmospheric stability, minimal cloud cover, low humidity, dark skies, minimal atmospheric pollutants, and the transparency of the atmosphere to infrared radiation. The trade wind inversion layer caps the upper layer of clouds at an approximate elevation of 7,000 ft for most of the year resulting in a stable, dry air mass above the inversion. Due to the location of the Hawaiian Islands within the northern hemispheric tropics, astronomers can observe the entire northern sky and nearly 80 percent of the southern sky.

[20] Source: "Land Titles, Local Style" by Attorney James K. Mee, Ashford & Wriston, 2007.
[21] Source: "Land Titles, Local Style" by Attorney James K. Mee, Ashford & Wriston, 2007.

Smithsonian SMA, Subaru and Keck observatories in the summit region

UH has entered into scientific partnership agreements with various institutions from around the world to develop and use observatory facilities on Mauna Kea. As a part of these agreements, the University has subleased portions of the Science Reserve for the development of observatories. Twelve observatories are in operation in the Astronomy Precinct housing nine optical/infrared telescopes, and three radio telescopes. Another radio telescope, the Very Long Baseline Array facility is situated within the Science Reserve at 12,200 ft.

2.8 Health and Safety Concerns

Mauna Kea is a remote location with few public accommodations and limited on-site capability to respond to health and safety emergencies. 911 calls go to the Hawai'i County Police/Fire dispatcher who will contact the nearest emergency assistance available. Frequently it is the PTA Fire Department that responds, as long as they are not tied-up with military operations. All rangers are required to have First Responder training and certification.

The UH Management Areas range in elevation from 9,200 ft at Hale Pōhaku to 13,796 ft at the summit, and the human body needs time to adjust to such changes in elevations. Physiological responses can be life threatening depending on the person's health conditions. The health conditions of visitors to Mauna Kea are unknown, and there is no mechanism in place to ensure that all visitors receive health and safety warnings. People are encouraged to stop at the VIS for at least 30 minutes to give the body time to adjust, although not everyone who allows time for acclimation will successfully adjust to the change in altitude. Anyone experiencing altitude sickness should descend to a lower elevation immediately. Certain people are discouraged from traveling to the summit including pregnant women; people with high blood pressure, heart or respiratory conditions; scuba divers that have been diving within the past 24 hours; anyone who has been drinking alcohol; and persons under the age of 16. Additionally, visitors traveling to the summit are encouraged to bring sunscreen, sunglasses, drinking water and warm clothes in order to be prepared for rapidly changing and extreme weather conditions.

Warning signs near the summit

The natural conditions and high elevation of the Mauna Kea summit region pose inherent dangers to the public. There are dangers for which no amount of care can eliminate. These dangers become more apparent when people are unfamiliar with the terrain or travel into more remote areas, particularly at night. Such an environment raises potential liability concerns for UH as the principal manager. The CMP provides for the right of UH to require a Waiver of Liability.

Highest priority is given to conveying health and safety information through informative brochures, signage and person-to-person communication by VIS staff, rangers and volunteers. There are safety concerns at night at the VIS where evening stargazing can be very popular, and attendees will commonly park along the shoulders of the road when there is not enough parking at the VIS. This involves people crossing the road on foot in the dark and can be a hazardous situation.

Above Hale Pōhaku the Summit Access Road is steep, rough, winding, and difficult to maneuver, especially in bad weather. It is unpaved for approximately 4.6 miles, lacks emergency escape ramps and telephones, and shoulders and guard rails are needed in certain locations. Most rental car companies do not permit their cars on the Saddle Road (Route 200) or the Summit Access Road. While four-wheel drive vehicles are strongly recommended, many motorists ignore that recommendation, and drivers may not know how to safely operate their vehicle, especially on the steep, downhill return from the summit. During snow periods ice buildup on the road can be problematic for unfamiliar and unprepared drivers. Signs (hazard warnings and directional) have been installed on an as-needed basis and vary widely in style and condition.

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3 Summary of Public Activities

3.1 History of Activities

Native Hawaiian activities in the Mauna Kea summit region in the pre-contact era are thought to have had three primary themes: adze manufacture, rites related to birth and death, and as a place of pilgrimage to communicate with gods and goddesses (McCoy and Nees 2009). Quarry sites and lithic chipping piles attest to the importance of the area for harvesting high quality stone material for tool manufacture. A broad scatter of several hundred small shrine sites throughout the summit region and the Ice Age NAR demonstrate the role of the area in religious observance (McCoy et al. 2009). A small number of burials have been identified and oral histories describe religious and family traditions that continue till today (Maly and Maly 2005). Several ancient historic trail networks are said to have crossed the saddle area and the summit region, but only one historic trail, the Mauna Kea–Humu'ula Trail (a.k.a. Kalai'eha–Waiau Trail), appears on a map produced in 1892.

Historic accounts of scientific expeditions and visitations of the summit region in the 1800s are richly descriptive and informative, providing insights into early discoveries and risks of traveling in this remote region on foot or horseback. The records include notable figures in Hawaiian history including: Hawaiian royalty and their advisors (King Kamehameha III, Queen Emma, Gerrit P. Judd, Rev. Hiram Bingham), missionaries (Joseph Goodrich and C.S. Stewart), botanists (James Macrae and David Douglas), explorers (Commander Charles Wilkes and Isabella Bird), and scientists and surveyors (Captain Clarence E. Dutton, W.D. Alexander, E.D. Baldwin and E.D. Preston). These people were often accompanied by skilled assistants, and altitude sickness was a common occurrence. The sheep station at Kalai'eha (a.k.a. Humu'ula Sheep Station) is frequently mentioned as a base camp for travelers during this period (Maly and Maly 2005).

In the early 1900s the Mauna Kea–'Umikoa Trail (a.k.a 'Umikoa-Ka'ula Trail) was a regular route used on horseback by families who lived in the ranching community of 'Umikoa (at approximately 3,500 ft.). For them it was a special excursion to show visitors Lake Waiau and the summit. At that time the trail was regularly marked with *'ahu* to prevent getting lost in the fog (Tomich 2008). Scientific expeditions continued in the early 1900s, and the Civilian Conservation Corps (CCC) in the 1930s completed many projects on Mauna Kea, including fence building and repairing, tree planting, trail building (some re-routing of the Mauna Kea–Humu'ula Trail), and the building of a stone cabin in 1936 that was named

Hale Pōhaku (Stone House) by Territorial Forester L.W. Bryan. By the time Hale Pōhaku was built there are several written accounts of hiking, skiing and even ice skating on Lake Waiau, and the stone cabin was used as a rest house by scientists, hunters and recreationists (Warshauer 2001; Maly and Maly 2005).

Road improvements that ushered in the expanded public use of the upper slopes and summit of Mauna Kea began in the 1930s with a rough road built by the CCC from the mountain road junction up to Hale Pōhaku. This also led to additional improvements at Hale Pōhaku including the building of an additional stone building. (The historic stone buildings are presently closed to the public.) The Saddle Road was constructed in 1943 to access the emerging Pōhakuloa Military Training Area, and ownership of the road was assumed by the Territory of Hawai'i in 1947. Road improvements were undertaken in the 1950s to short segments of the road up to Hale Pōhaku, but momentum to build a road to the summit began in the early 1960s with interest expressed in utilizing the "extraordinarily good" summit location as a test site for lunar research by the Lunar and Planetary Laboratory of the University of Arizona. This idea captured the interest and support of the business and political community, resulting in authorization by Governor Burns of $42,000 to build a rough, four-wheel drive road from Hale Pōhaku to Pu'u Poli'ahu, which became the site for the first test telescope. The first rough road was dedicated in 1964 and since then the Summit Access Road has undergone several improvements as public funding has been made available (Warshauer 2001; Maly and Maly 2005).

The establishment of the summit of Mauna Kea as a premier location for astronomical research and the resulting road improvements have significantly transformed and facilitated the mountain's accessibility to the public. There is no written record to date the first commercial tour to the Mauna Kea summit but this probably began in the 1960's after initial road improvements.

3.2 Data Sources and Collection Methods

Prior to 2001, data on visitors to the Mauna Kea summit was not recorded by UH. Beginning in 2001, with the establishment of the ranger program by OMKM and MKSS, data began to be collected daily and procedures for recordation were developed and refined. The data cited in this plan are the result of analyses of data reported by the rangers from 2003 to the end of 2008 and reflect the best available, most current information on visitation and activities within the UH Management Areas. Additionally data on commercial tour passengers were collected by DLNR prior to the transfer of permit responsibilities to UH in 2007. Commercial permit data from both DLNR and OMKM sources are used in this report.

Except on days when the Summit Access Road is completely closed due to severe weather conditions, rangers submit a daily report of the activities and events that occur between Hale Pōhaku and the summit. Rangers record the number of vehicles, by category and time-of-day, which proceed beyond the VIS. They also record the numbers of hikers, hunters, bikers, and motorcycles they observe. Rangers also document incidents they encounter, including visitors experiencing health or vehicular related difficulties. Two rangers are on duty each day, except on Saturdays when there are three rangers on duty. During their 15-hour shift they take turns patrolling the Summit Access Road between the VIS and the summit area for a total of four round trips each day.

Ranger reports are forwarded to OMKM daily where they are entered into a database. In addition, rangers log the numbers recorded on a vehicle counter located on the Summit Access Road just above Hale Pōhaku. This counter provides additional counts with which to verify ranger observational data. However,

the counter has been problematic over the years, particularly in the winter when the pressure hose is punctured by snow chains and heavy equipment.

A rough measure of visitor use can be made based on tracking the amount of water used in the restrooms at the VIS. Commercial sales at the VIS also provide some additional indication of visitor trends. Data on water use or VIS sales are not included in this report but are used internally to help verify observations. The data collection process for monitoring public use in the UH Management Areas continues to improve and is still being refined. Suggestions on how to improve the process are included in Section 6.4.

3.3 Summary of Existing Activities

3.3.1 Overview

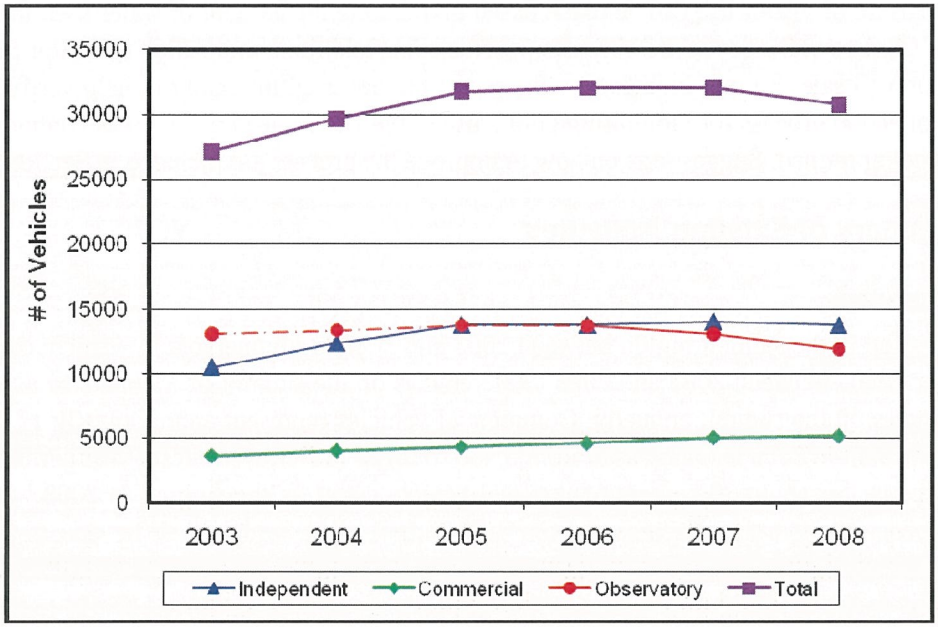
Public visitation in the summit region between 2003 and 2008 is summarized by vehicle counts in Figure 3-1 (Ranger data). Between 2003 and 2008 total vehicles on the summit of Mauna Kea averaged around 32,000 vehicles on the summit annually. Commercial vehicles represent approximately 17 percent of the total vehicle count in 2008 and increased from 3,599 to 5,164 (43%) over the six year period. Observatory vehicles account for about 38 percent of the total vehicle count on the summit in 2008.[1] Between 2006 and 2008 observatory traffic decreased from 13,675 to 11,844, which may be due to increased ride sharing. Vehicles driven by independent travelers (visitors and residents) represented 30 percent of the total vehicles on the summit in 2008 (see Table 3-1). This group increased from 10,464 to 13,710 vehicles or 31 percent in six years. Ranger data indicate that one in four of the independent traveler vehicles are two-wheel drive and a significant proportion of these vehicles appear to be rentals (Ranger interviews). No detailed data on rental cars is collected.

Table 3-1. 2008 Total Summit Vehicle Count

Observatory vehicles	11,844
4x4 Vehicles (independent travelers)	10,438
Motorcycles	44
2wd Vehicles	3,272
Commercial Vehicles	5,165
Total Vehicles on Summit	**30,763**

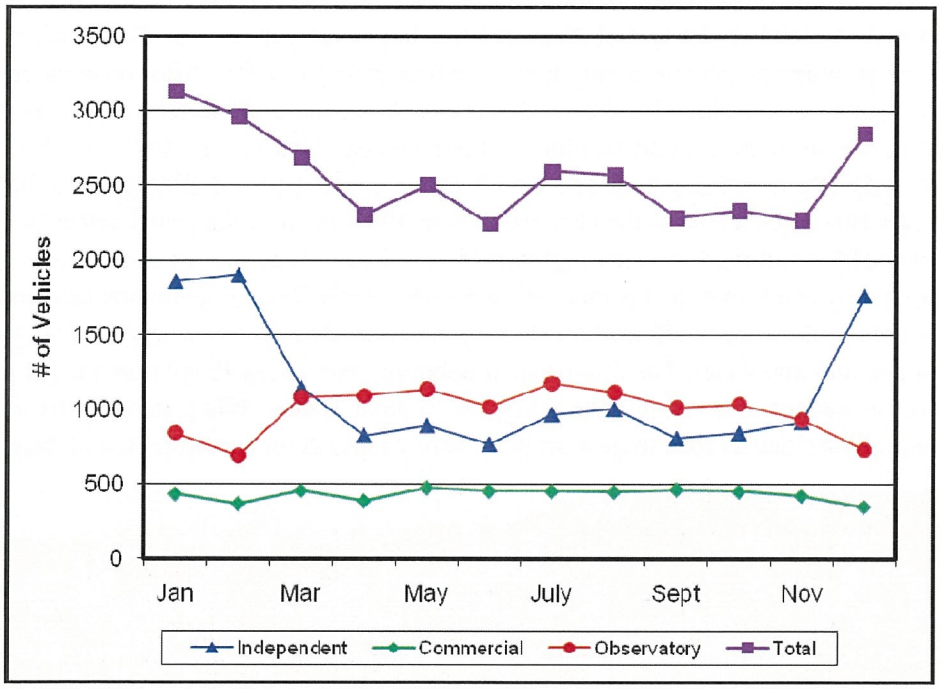
[1] For the period of June 2001 to April 2005, ranger's observational data regarding observatory vehicles totals may have been inadvertently double or even triple counted since staff vehicles remain in place for long periods during any given day. The counting process was revised in May 2005. Vehicle numbers shown in Figure 3-1 are shown as a dashed line to reflect adjusted estimates to distinguish them from observed ranger data.

Figure 3-1. Vehicles on the Mauna Kea Summit Annually



On an annual basis vehicle counts vary by month, which could be a reflection of visitor industry trends and weather conditions. Figure 3-2 indicates that total monthly traffic in 2008 varied between 2,200 and 3,200 vehicles, or on average less than 100 vehicles on the summit per day. Vehicle counts on the summit rise dramatically in the winter months to reflect high volumes of snow related visitors. Vehicle counts drop to zero for 5-10 days per year when the road is closed for safety reasons due to snow, ice or other severe weather conditions. The vehicle count then spikes to between 450-600 vehicles on active snow days when the road is open. Observatory traffic dips during the winter months and is relatively stable during the rest of the year. Commercial tours are relatively stable year-round.

Figure 3-2. 2008 Monthly Vehicles on the Mauna Kea Summit



No formal head count of visitors is collected at either the VIS or in the summit area. To arrive at total summit visitor estimates, an average number of people in each observatory or independent traveler car was estimated based on ranger estimates of average occupancy.[2] This number is then multiplied by the total number of vehicles counted in each category. Commercial visitor counts were obtained from OMKM from data provided daily by commercial operators.

Estimates for 2008 indicate that 117,168 people traveled to the summit. Twenty-five percent of those people were associated directly with observatory operations, 30 percent were independent travelers and 45 percent were commercial tour visitors. Table 3-2 provides a breakdown of the estimate based on 2008 vehicle counts and OMKM commercial tallies.

Table 3-2. 2008 Estimated People Counts

Observatory Staff at 2.5 per vehicle	29,610	25%
Independent Travelers visitors at 2.5 per vehicle	34,385	30%
Commercial visitors from OMKM tally	53,173	45%
Total Estimated People	**117,168**	**100%**

[2] Rangers estimate approximately 2.5 occupants per vehicle for both independent travelers and observatory groups. These numbers are considered reasonable estimates for the purpose of the PAP. The development of a more methodological approach is recommended for long term visitation monitoring.

3.3.2 Observatories

There are 13 observatories of varying sizes in the Science Reserve.[3] Resident and visiting astronomers work primarily from base operations in Hilo and Waimea, and occasionally travel to the summit. Larger facilities such as Gemini, Subaru, and Keck require larger support crews. The smallest observatory, UHH's 0.9 meter telescope generates only intermittent operational traffic. Most observatories have a day crew that commute on weekdays from base operations. A second crew of telescope operators travels to the summit nightly from the support facilities at Hale Pōhaku. Observatory traffic is about equally split between the early-late morning period and the afternoon-evening period (Ranger data 2008). Since the installation of a fiber-optic cable to the observatories in 1991 much of the actual scientific observation is conducted remotely, resulting in smaller nighttime crews. Most observatories operate with a minimum of two persons on duty at all times to ensure employee safety. Only limited operations take place outside the observatory domes since the staff works primarily indoors. Observatories require periodic third party deliveries of supplies and water. The Smithsonian Submillimeter Array (SMA) rearranges its dish shaped antennas over a number of existing pads every six to eight weeks. When moving the antennas, SMA closes the unimproved access road to their array for safety reasons for a short period of time.

CalTech, JCMT, and Smithsonian SMA observatories near the base of Pu'u Poli'ahu

Observatory staff drive clearly marked four-wheel drive vehicles and drivers are required to use proper equipment on their vehicles (e.g., snow chains). Most observatory staff have some additional training in winter driving techniques.

Observatory related traffic increases during periods of facility construction due to the movement of heavy equipment, transportation of construction workers and construction material. Some construction workers are accommodated at the mid-level facilities at Hale Pōhaku, while others commute daily to the worksite. Traffic from major facility construction is not reflected in the ranger data collected between 2003 and 2008 as no major construction occurred during that period.

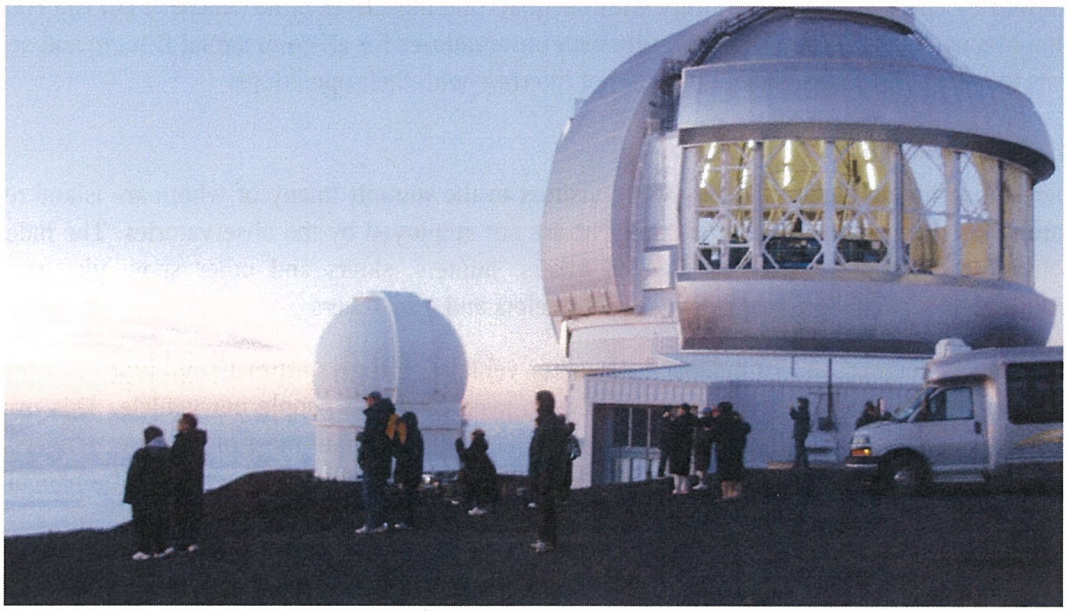
[3] There are 12 operators as Keck I and Keck II are managed by the same operator.

3.3.3 Commercial Tour Visitors

Commercial tours are permitted in the UH Management Areas on Mauna Kea under permits granted by UH (see Section 2.5.3). Currently nine commercial tour permittees are allowed to operate in the UH Management Areas. Permits are granted for a one-year period and are re-issued annually.

The bulk of the commercial tour business on Mauna Kea is built around sunset and stargazing tours. Each operator is allowed two vehicles on the mountain during this period with a maximum of 14 visitors in each vehicle. If all operators were completely enrolled on any given evening, there could potentially be as many as 252 commercial visitors on the summit during the sunset period. Full enrollment rarely occurs. OMKM data indicated that in 2008 an average of 141 commercial visitors were on the summit daily with a monthly average that ranged from 108-166 visitors per day depending on the time of year.

Most commercial operators utilize the VIS as a rest area for their customers to acclimatize and use the restrooms. Some tours stop to eat dinner, view the educational videos and displays, and shop in "The First Light Book Store" before proceeding to the summit. Congestion at the small VIS facility is particularly evident during the pre-sunset period. Evening tours are spread out over several viewing areas on the summit, concentrating on the eastern summit ridge where the sunset is best viewed. Following sunset, each commercial tour has a pre-arranged location at a lower elevation where they set-up their own stargazing equipment. Evening stargazing activities at the VIS are free and reserved for residents and independent travelers. Commercial tour operators are required to conduct their own stargazing programs in a different location using their own equipment. Commercial tour vans must depart the VIS parking area by 6:00 pm, unless they are transporting disabled customers. Commercial tour customers may still access the restrooms, VIS exhibits, and bookstore after 6:00 pm, but are required to participate in stargazing activities provided by their tour operator.



Commercial tour at sunset

Commercial operators are allowed to bring visitors to the summit during other non-peak times. Tour operators are pre-approved to take up to three vans per day during off-peak hours. If a commercial tour operator plans to take more than three vans during the off-peak hours, they will require permission from OMKM. There are sunrise tours nearly every day, with intermittent midday tours, mostly to service cruise ship passengers. In 2007, 88 percent of the commercial tours were sunset and stargazing related, while 12 percent of the tours occurred during other times of the day (Ranger data 2007).

Commercial operators are required to use four-wheel drive vehicles. They are allowed to park in the VIS parking lot with restrictions and provided their vehicles do not exceed certain lengths and widths. At any one time an operator may have a maximum of two standard commercial vans in the VIS parking lot.

Each operator pays OMKM $6 per passenger transported to Mauna Kea as part of their permit obligation. These funds are used to cover expenses, including water, sewage fees, utilities, trash removal, road maintenance, and ranger and VIS staff time attributed to commercial tours. Commercial visitors also patronize the bookstore in the VIS. Bookstore revenues help support the VIS operation.

Commercial visitors are pre-screened by the tour operators who advise their customers of the potential hazards of high elevation travel, especially pregnant women, people with heart and lung ailments and children under the age of 16. Commercial operators are required to indemnify the State and UH and to carry commercial general liability insurance naming the State and UH as additionally insured. Operators generally provide cold weather gear to visitors to prepare them for summit conditions.

Other commercial activities include filming. All film permits are initiated through the Hawai'i Film Office but OMKM is responsible for reviewing and approving the applications.[4] From 2003-2008 between 28-55 film requests a year were approved for both still and video photography. Each film request is reviewed by OMKM for compatibility with the goals and objectives of the Master Plan and compliance with the Mauna Kea CMP. OMKM consults with observatories for all commercial filming and aerial film requests to ensure the proposed activity will not interfere with their operations.

3.3.4 Independent Visitors

Independent visitors include all other public visitors to the summit (many of whom are island residents) who are not counted in the commercial tally or are not employed by the observatories. The independent segment of the visitor population includes hikers, hunters, skiers and other snow players, cultural practitioners, educational groups, independent travelers and researchers.

In 2008 rangers counted 13,710 independent visitor vehicles. Rangers estimate the number of people per vehicle ranges between two to three people, for an average of 2.5 people per vehicle. This user group accounted for approximately 34,385 visitors/year in 2008. Throughout most of the year, rangers observe that the primary independent visitor is a tourist exploring Hawai'i Island. This changes dramatically when there is snow on Mauna Kea (see Section 3.3.5).

Independent visitors are a diverse group with unknown health conditions or knowledge of the potential dangers on Mauna Kea. They may be unaware of health risks related to high altitudes and may elect to bypass the VIS where they can receive an orientation about Mauna Kea or acclimatize before proceeding

[4] The processing of film permit requests was transferred to OMKM from IfA, which prior to 2001 reviewed and approved all Mauna Kea film permits issued by the State Film Office.

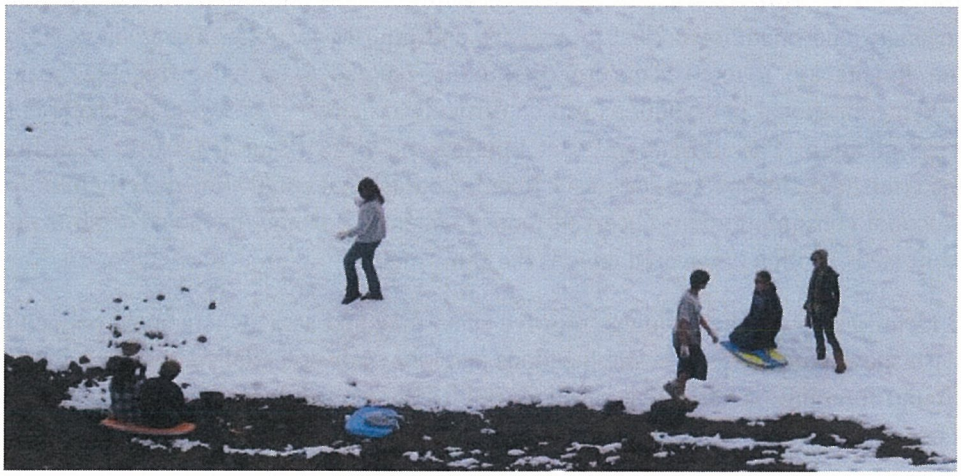
to the summit. They also have an unknown level of knowledge of the importance and sensitivity of natural and cultural resources in the area. These visitors may hike or explore, or potentially venture off established roads and trails in the process. It can be difficult to distinguish local families or practitioners who come to the mountain for cultural or religious purposes from other visitors. As a result, rangers focus much of their daily attention on the independent visitors' safety and education.

Rangers, interpretive guides and observatory staff are called upon to assist in all emergencies in the summit region Among the more common incidents related to the independent traveler: (1) brake failure due to incorrect driving techniques on the steep descent; (2) medical incidents requiring oxygen and immediate evacuation to a lower elevation; and (3) snow play related injuries.

As shown in Figure 3-1, the number of independent visitors has been rising slowly over the last five years. As road conditions improve and rental agencies lift the ban on driving the Saddle Road, this number is expected to continue to increase.

3.3.5 Snow Play

Snow can fall on the summit of Mauna Kea at any time of the year, though it tends to accumulate on the ground primarily from late fall to early spring. When snow accumulates sufficiently to cover the rocky terrain, it becomes a magnet for visitors, many of whom would not otherwise venture into the summit region. Rangers note active snow play at varying intensities between 5 and 20 times per year, depending on the amount of snow. Peak use takes place on weekends and holidays that follow periods of heavy snow.



Snow play in the summit region

Snow and ice accumulating on the Summit Access Road can result in its closure to the general public to protect public safety. Road closures are announced on local radio and television stations, posted on the Mauna Kea VIS website, the Mauna Kea Weather Center webpage (http://mkwc.ifa.hawaii.edu), recorded on a public information hotline, and faxed to other media outlets. According to ranger observations, efforts to forewarn visitors of road and weather conditions in recent years have significantly reduced the amount of user frustration and the queuing of cars at the VIS waiting for the Summit Access Road to be opened. The road is kept closed to the general public until the snow and ice are cleared on both lanes of

the Summit Access Road to allow two-way traffic, and designated parking areas and road sides are cleared and safe to accommodate public use. Observatory personnel are permitted on the road prior to the general public once snow is cleared sufficiently to allow limited vehicular access to specific observatory facilities. Observatory vehicles represent a discrete number of vehicles traveling in one direction to a defined destination where they will park and enter their work site. Staff is experienced with driving in snow conditions, their vehicles are equipped with chains, and they are aware of safety precautions when large and dangerous snow removal equipment is operating. Some frequent snow users have expressed frustration with not being able to access the road at the same time as observatory staff. Management practice is to insure that two-way traffic can be accommodated safely and parking areas are clear to prevent congestion before the road is opened to the general public. The use of a singular road safety standard for the general public is important to consistent management of public safety in the summit region.

Peak visitor presence on snow days is a significant management challenge for the rangers, VIS staff and MKSS. On days following heavy snow fall in 2008, rangers estimated the summit region's daily vehicle count to be between 400 and 600. Most vehicles have three or more people resulting in an estimated 1,500-2,200 visitors per day. Average stay on the summit is also longer than it is during the rest of the year, estimated at 2-3 hours instead of the average 30 minutes on non-snow days. There is also an increase in the number of pickup trucks that drive to the summit, which are primarily collecting snow to take home for snow play.

The largest number of local residents, including family and friends, visit the summit region on snow play days. These times are also when high numbers of children are subjected to the rigors and risks of high elevation changes and conditions. Health incidents and injuries increase during snow periods. Pregnant women and infants are a major concern, prompting rangers to provide frequent health advisories. However, such educational interventions can be difficult to deliver if crowd and vehicle control requires their priority attention. The most significant injuries and risks result from use of difficult-to-control sledding materials (e.g., inner tubes, car mats, boogie boards) that could slide directly into exposed rocks. Drug and alcohol consumption are observed more frequently on snow days and trash from food, drinks and makeshift sleds is often uncovered later as the snow melts.

Figure 3-3 identifies areas where rangers observe snow play and areas where snow collection commonly occurs. It also shows known historic site locations and known or potential wēkiu bug habitat. Wēkiu bugs are often found foraging on the edges of snow fields. Research is needed to determine the impacts of snow play on either historic sites or wēkiu bug habitat.

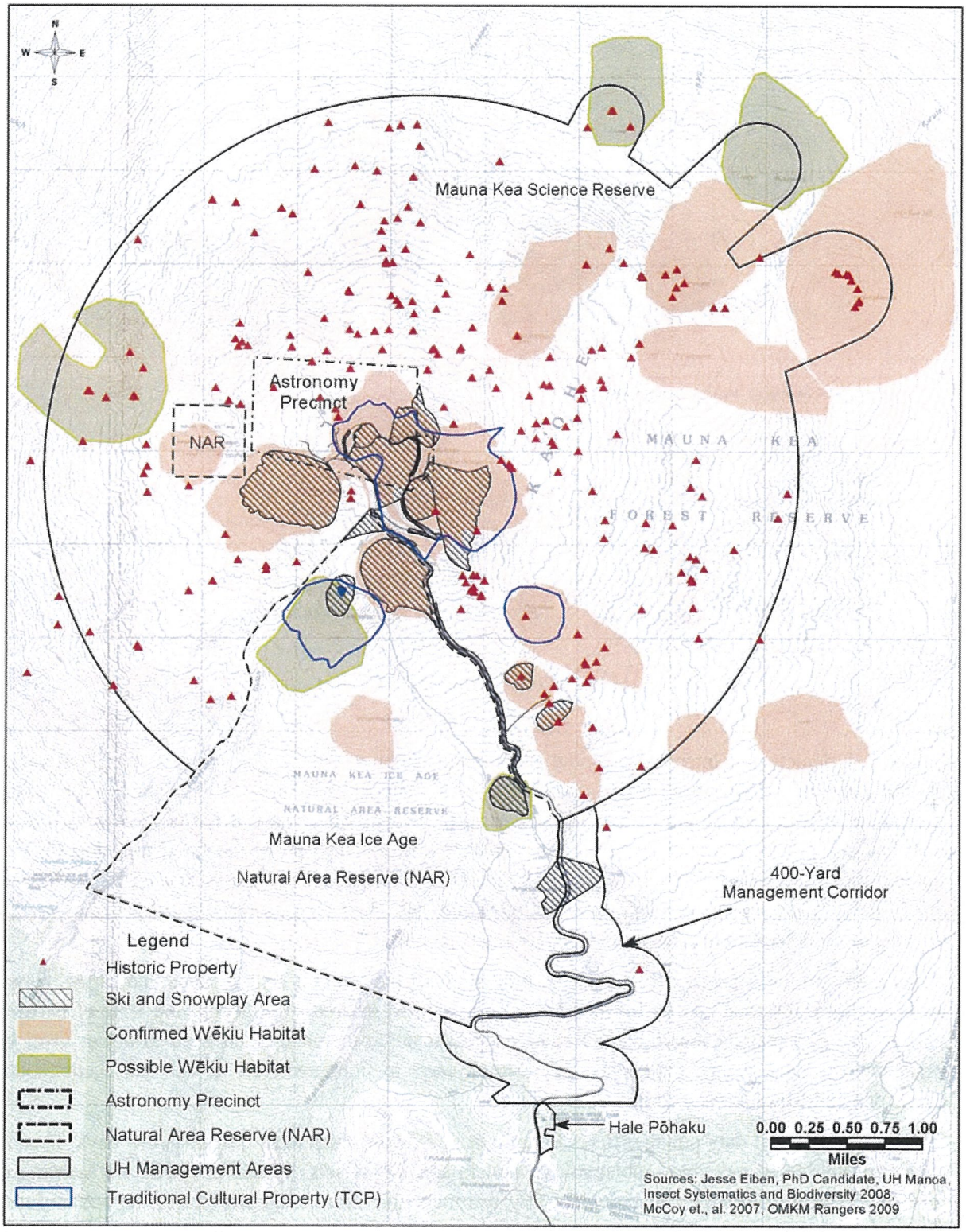


Figure 3-3. Historic Sites, Wēkiu Bugs and Snow Play

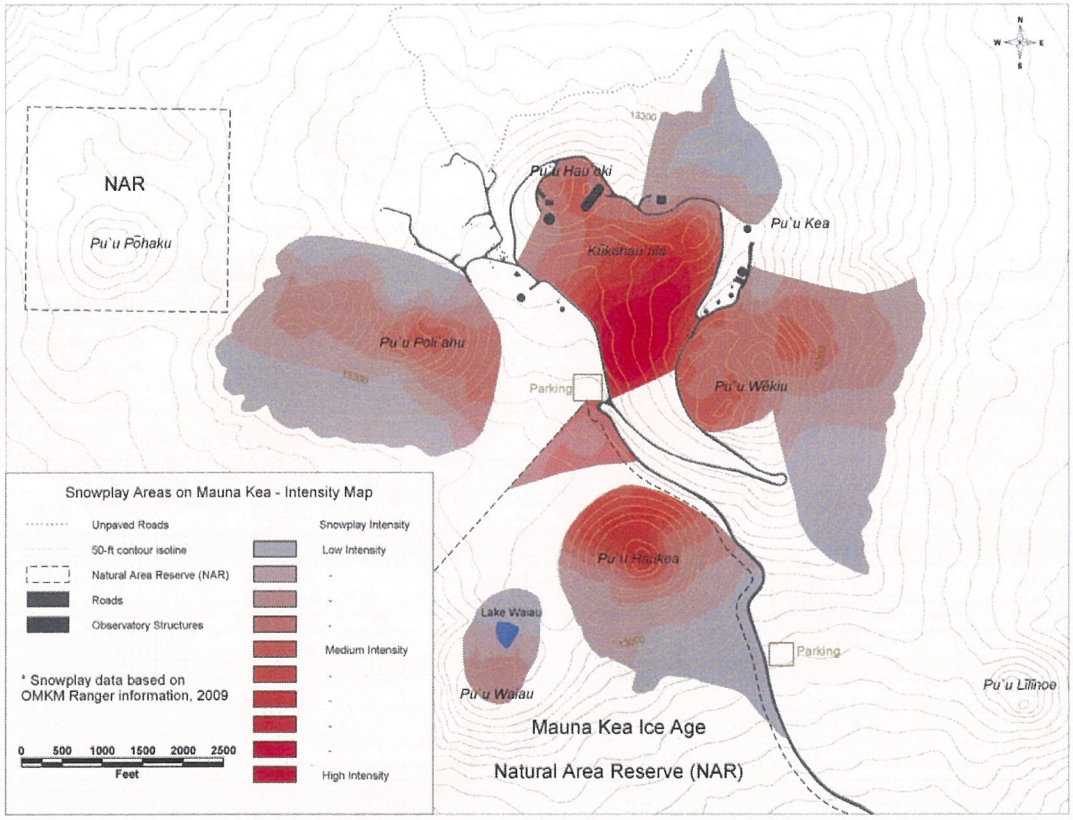


Figure 3-4. Snow Play Intensity

Figure 3-4 depicts the intensity of snow play in the summit region. The map is based on ranger observation and reflects the degree to which certain slopes are used by the public for skiing, snowboarding and general snow play. The highest area of concentrated use is the bowl-shaped slope of Kukāhau'ula, which drops steeply near the UHH 0.9 meter telescope to the bowl near the CalTech Submillimeter Observatory. Skiers and snowboarders navigate the slope, are picked up by friends and driven back to the top of the slope for additional runs. No other area on the summit provides for this ferrying of users back to the top of the slope for repeated runs.

When there is thick snow cover, parking is limited along the Summit Access Road and in the summit area. At times, the road can be blocked by vehicles parked in areas that disrupt the flow of two-way traffic. This is a major concern should emergency evacuation or medical aid need to occur. Over the years, rangers have gained experience and learned ways to minimize road tie-ups and accommodate public demand for snow recreation.

OMKM hires special-duty police officers to assist with crowd management on peak snow days. This has been very helpful in reducing problematic behaviors and illegal acts. Special-duty officers assisting on road patrols also free rangers to provide safety warnings and educational services to the public during these busy periods.

3.3.6 Hunters

Hunting is a permitted activity on the slopes and summit of Mauna Kea, including the UH Management Areas, the NAR and Mauna Kea Forest Reserve and Game Management Area (see Figure 2-3). There is a safety zone of 50 yards established along the Summit Access Road and the around the observatories that is set by hunting regulations. Hunting activities are licensed and subject to DLNR rules and regulations (see Section 2.5.1). Hunting roads in the vicinity of the UH Management Areas are shown on Figure 2-4 labeled as "Boundary Road," "Plane Crash Road," and "R-17."

Hunters with mouflon sheep at the second switchback above Hale Pōhaku

Rangers mainly observe hunters in groups of one to three parked along the Summit Access Road at the second switchback. From there they walk cross-country near the lower boundary of the Ice Age NAR, and are frequently picked up at a lower elevation. Hunting also takes place infrequently at, and below, Lake Waiau where game mammals occasionally come for water. Rangers report seeing hunters between 10 and 30 days per year over the last five years. The number of individual hunters is not specifically recorded. Some hunting in the Science Reserve originates along the Boundary Road that encircles Mauna Kea at roughly 9,200 ft, outside of the UH Management Areas. Hunting *mauka* (towards the summit) of the Boundary Road generally goes undetected by the rangers as it is remote and seldom visible from the Summit Access Road.

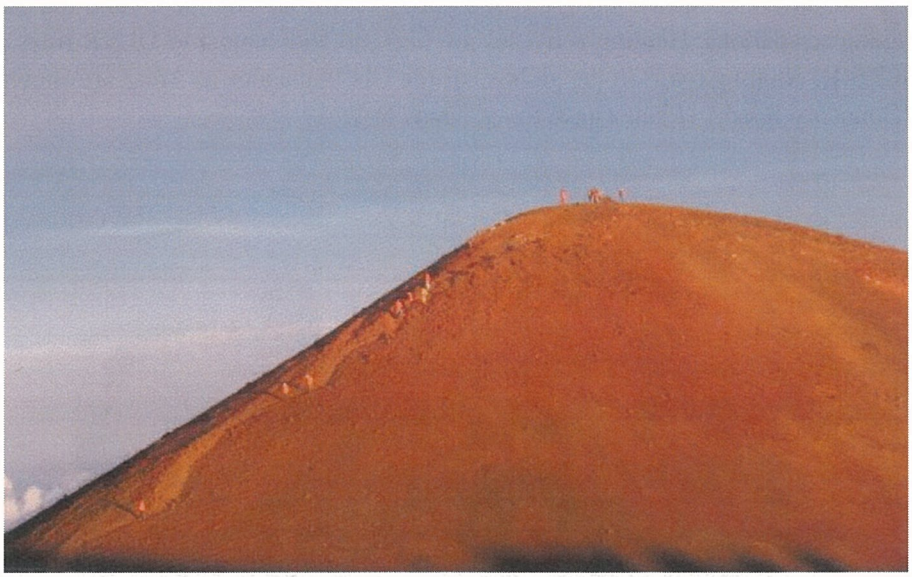
Hunters play a role in UH's management of the biological resources. Hunting of feral animals is consistent with management objectives in the NRMP to reduce feral grazing as a way to protect native species.[5]

3.3.7 Hikers

Between 2002 and 2008 rangers observed between 4,379 and 6,794 hikers per year on five trail routes. The most heavily used trail is the short trail from the observatories to the summit of Mauna Kea on Pu'u Wēkiu. This is a short trail with several side routes that have informally developed in the absence of one

[5] DLNR is under a court mandate to eliminate feral ungulates from the areas designated as Palila critical habitat, which includes much of Mauna Kea below the summit region. Therefore, the goal of the hunting program on Mauna Kea is reduction in numbers of feral ungulates, and not maintenance of a stable population for long-term recreational hunting.

approved, well-designated trail. Visitors are naturally drawn to the mountain summit and are also attracted by the ceremonial altar or *lele* that was constructed on the summit in 2002. Around 2,900 people were observed hiking on Pu'u Wēkiu in 2008, down substantially from 4,880 in 2005.



Hikers on Pu'u Wēkiu, summit cone of Mauna Kea.

The second most popular trail is one leading from the Summit Access Road to Lake Waiau in the NAR. It is approximately a 1.3 mile roundtrip on a relatively flat terrain to the highest natural lake in the Pacific Ocean Basin. Over the past several years rangers have observed between 700 and 1,300 hikers annually on this trail. There are two trails that lead to the lake, both starting from within the UH Management Areas. One trail begins at the base of Kūkahau'ula and the other from a parking area on the southern base of Pu'u Haukea.

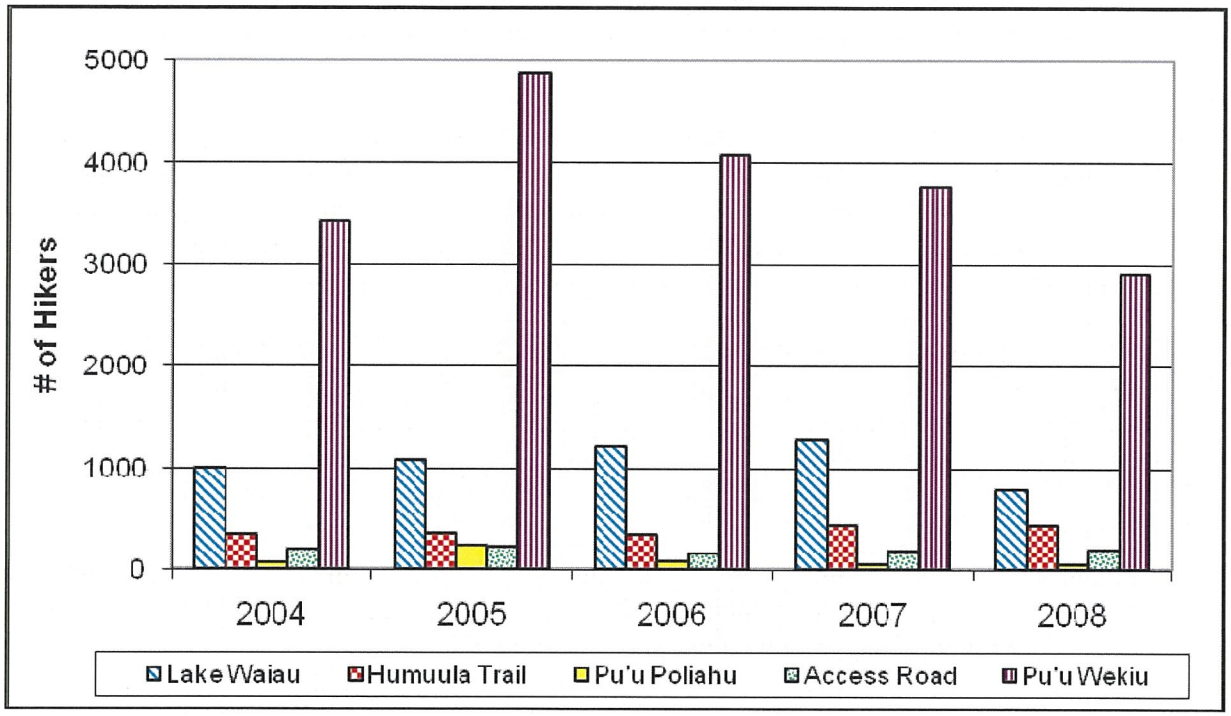
The Humu'ula Trail is a historic route first mapped in 1892 by W.D. Alexander. Alexander documented that the trail extended from Kalai'eha where the former Humu'ula Sheep Station is located to Lake Waiau and beyond. The trail is marked with signage in the NAR that was installed by DLNRs Nā Ala Hele program. It receives little maintenance or management by the State. Volunteers from the VIS volunteer program occasionally check the trail for trash and other concerns. It is an arduous uphill trek that begins near the VIS and skirts the adze quarry in the NAR. Over 400 people have been observed walking this trail in each of the last two years. A Special Use Permit is required of groups larger than 10 in the NAR.

Another trail in the summit region is along the old access road to the summit of Pu'u Poli'ahu. The road was graded on the side of this *pu'u* to provide access for the first optical testing site in 1964. Kahu Kū Mauna has asked that the road be renaturalized. The area is now designated and signed as a sacred area, being the namesake of the snow goddess, Poli'ahu. Use of this trail has fallen off substantially in recent years with only about 50 hikers per year being observed on Pu'u Poli'ahu. Once the old access road is renaturalized there will be no trail to the summit of Pu'u Poli'ahu.

Approximately 200 hikers annually use portions of the Summit Access Road as a way to access the summit region. Additional trails near the VIS are frequented by Mauna Kea visitors, but these trails are

outside of the UH Management Areas in the State Forest Reserve. Nevertheless many VIS visitors who elect not to drive to the summit hike these trails, which (like the trail to the summit of Pu'u Wēkiu) have informally multiplied in the absence of approved, well-designated routes. The summit of Pu'u Kalepeamoa is particularly popular for sunset viewing, reportedly attracting as many as 100 people during that time of day. No trail management is occurring nor are visitor counts being kept on the trails in the State Forest Reserve. Impacts of these trails on natural and cultural sites are unknown.

Figure 3-5. Trail Use in the Summit Region



3.3.8 Researchers

A small number of scientists conduct research in the UH Management Areas. Natural and cultural resources inventories and studies have resulted in an increased presence of researchers in recent years. Archaeological surveys were completed in the UH Management Areas and the NAR in 2009. Wēkiu bug research and surveys of alien invertebrate species are ongoing. The primary purpose of this research is to obtain baseline data on the existing resources and to identify areas where additional research and monitoring may be required.

Depending on the scope, activity and equipment required of a study, researchers may be required to obtain permits to conduct their studies. Researchers are a small but important user group. They will travel to remote areas of Mauna Kea's upper elevation lands where visitors do not go. They are also key to the future implementation of the recommended resource management and monitoring programs contained in the CMP, NRMP and CRMP.

3.3.9 Cultural Practitioners

There is no way to measure the size of the cultural practitioner user group, in part because they may not wish to be identified to managers or other authority figures. Native Hawaiian traditional and customary practices are occurring in the UH Management Areas as well as in adjacent lands. Some of these practices are private, conducted in remote locations and can occur at any hour of the day or night. Others are conducted with great ceremony involving prominent gatherings of both practitioners and observers. Sometimes the cultural practices leave no trace, and sometimes physical offerings are left. In some cases, children's umbilical cords or *piko* are deposited discretely and marked by small pilings of stone. Occasionally families will deposit ashes from family members who had personal attachment to Mauna Kea.

Taken collectively, these cultural practices are indicators of the ongoing cultural and spiritual value of the summit region to Native Hawaiians and others. The exercise of Native Hawaiian cultural practice is protected by law and accommodated by UH management. There are concerns, however, within and outside of the Native Hawaiian community that some of these practices could alter existing historic sites, or leave perishable food items that can attract scavengers and invasive species.

Not all cultural practice on the summit is Native Hawaiian in origin. Many cultures throughout the world recognize a spiritual power in natural places such as Mauna Kea. The sanctity of mountain summits attracts pilgrimages and recognition throughout the world. There have been observances of practices of other cultures in the summit region.

3.3.10 Incident Summary

The rangers' daily report includes a summary of incidents that were observed on any given day. This incident data is aggregated in three categories, health, vehicular and trash. Figure 3-6 summarizes the number and types of incidents reported between 2002 and 2008.

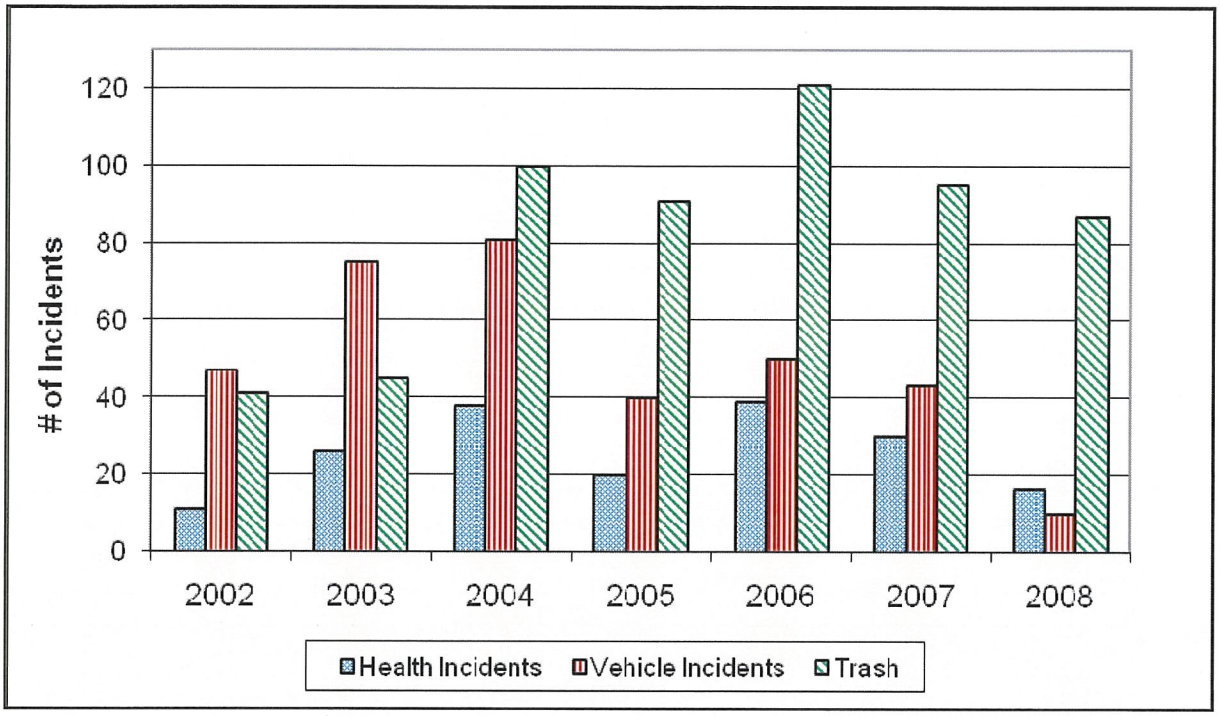
Health incidents refer to any situation when a ranger was called or was aware of a circumstance when a person was exhibiting symptoms of poor health while in the UH Management Areas or adjoining NAR. This could include, for example, shortness of breath or chest pains, a snow play related injury or a twisted ankle that required attention. There have been between 20 and 40 such health related incidents annually in recent years. Most occurrences are minor and managed by the visitors themselves. Some require the administering of oxygen or contacting emergency medical support.

Vehicle incidents include anything from cooling of smoking brakes at the VIS (the result of inexperienced drivers' overuse of brakes on the steep descent), to cars that will not start, and minor or major accidents. Most of these events are minor. There have been between 10 and 80 vehicle incidents annually between 2002 and 2008.

A formal incident report is filed every time rangers render aid in a circumstance in which there may be a follow up investigation and there is a need to have a good record of the event. These reports are, for example, filled out each time someone is administered oxygen or when 911 is called for a health-related issue. Figure 3-6 also includes an accounting of the number of times rangers encounter trash during their daily shift as noted in their daily reports. Much of this appears in parking lots. The largest portion of trash reporting takes place during and after periods of heavy snow play. In some cases litter is covered with

snow and only appears later as snow melts. Some rangers have noted a declining trend in the frequency of trash on the mountain and see this as a sign of heightened public awareness.

Figure 3-6. Incidents Reported by Rangers



A review of all the 911 calls (47) made by VIS staff and rangers between 2003 and mid-2009 indicates that the bulk of the calls are related to acute altitude sickness, cardiac events and motor vehicle accidents. Only one of these calls was for assistance for a behavioral related issue. Several high profile accidents in recent years have resulted in major injury or death. These 911 call records indicate that there was one fatal car crash in 2007 and one fatal case of cardiac arrest in 2004. There was also an accident resulting in serious head trauma that occurred when a sledder struck rocks during snow play in 2005 and a lost hiker in 2008 who was never found. While the lead emergency response agency is the Hawai'i County Fire Department, the County can request help from PTA Fire Department, which is capable of providing support for medical emergencies in the shortest response time, subject to availability.

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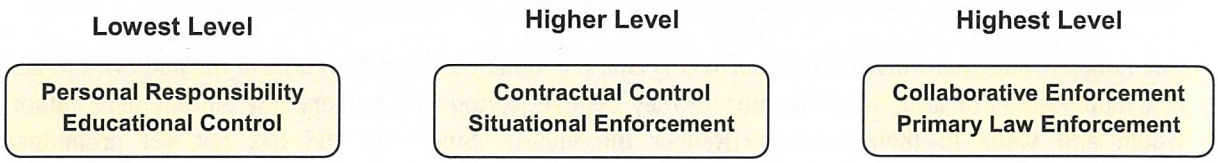
4 Public Access Control Methods

Public activities in the UH Management Areas come in a variety of forms and in varying concentrations over time. Management of public access is necessary to ensure public health and safety and resource protection. Management responses need to include a range of approaches that can best fit the activity and the circumstance. Ideally, management is accomplished at the lowest level of control that is effective, in ways that are least restrictive and intrusive. What follows is a description of six general approaches that, when applied effectively, can ensure the kinds of public behavior that are appropriate within the UH Management Areas. Figure 4-1 displays these six public access control methods in terms of the levels of enforcement authority they employ.

Figure 4-1. Range of Public Access Control Methods



4.1 Personal Responsibility

As individuals we bring our own personal sense of responsibility and *kuleana* to Mauna Kea. This sense of *kuleana* is shaped by our upbringing and by the degree to which we have been taught to act with common courtesy, humility and respect, both for nature and for other people. This internal guidance is the foundation upon which public behavior is shaped. It relies on a combination of prior life experience, internalized societal and cultural norms, respect for the rule of law, and a personal desire to act responsibly. Appropriate behavior can also be taught in homes, schools, clubs, *hula hālau* (hula schools), churches, work places and playgrounds. Although this sense of responsibility may not be shared equally by all members of the public, there is a foundation of personal accountability upon which to build. The most effective management tool is the ability of each individual to take responsibility for their own actions and to be open to learning new behaviors.

4.2 Educational Control

Educational control is intended to strengthen an individual's level of personal responsibility through educational methods that will raise people's awareness of what to do and what not to do. This type of management control can be achieved passively through interpretive signage and the distribution of brochures, or actively through direct interaction with interpretive staff. Both types of educational control (active or passive) may take place on-site within the UH Management Areas or off-site at visitor information outlets such as 'Imiloa Astronomy Center, radio/television, or the internet.

Passive education involves signage and other materials to inform visitors about health and safety precautions, sensitive resources and rules. Cultural and scientific displays in the VIS and brochures that outline altitude-related hazards are examples of passive education that are already in place on Mauna Kea. Other examples include signs posted along the roads that set speed limits, mark hazards and promote safe driving. Well-designed historic, cultural and natural resource signage can promote understanding of the landscape and invite a deeper appreciation and respect for Mauna Kea's significance. Signs serve as self-guiding tools, helping people to stay on the trails, instructing and reminding them of proper behavior, without having to be told by on-duty personnel. Passive education efforts can reach a broader audience through film, web sites and public service announcements.

Active interpretation involves direct interaction between rangers, VIS staff and volunteers and visitors to the mountain. The VIS is the front door of active interpretation, and to the degree that visitors stop at the VIS, rangers and staff have the opportunity to educate them. The rangers are trained to approach people in a helpful, but firm manner to be proactive in preventing negative or risky behavior from becoming a bigger problem. Rangers are also trained as First Responders in the event of emergencies and are available to render aid, monitor weather and road conditions, and observe public activities.

The rangers wear uniforms and drive officially marked vehicles. They do not have the authority to arrest or detain visitors or issue citations, nor do they believe having that primary law enforcement authority would add value to their services (Ranger interviews). Since the UH has not yet promulgated administrative rules for the UH Management Areas, guidance provided by the rangers and VIS staff to visitors must take the form of "recommendations" rather than "rules." By all ranger accounts, however, once visitors are informed of the recommendations and the reasons for them, voluntary compliance with their "recommendations" is the norm. There are few incidents in which visitors do not respond to the ranger's educational approach. Rangers who work for Hawai'i Volcanoes National Park corroborate the value of this approach and affirm that, for the most part, the public complies with rules that are conveyed in an educational format, especially when delivered in a courteous but firm manner by someone wearing a uniform.

Coordinated campaigns that integrate active and passive education initiatives are commonly used to improve public behavior and enhance visitor experiences in natural areas around the world.

4.3 Contractual Control

User groups that are required to enter into some form of contract with UH in order to conduct their activities in the UH Management Areas include commercial tour operators, film companies, and the observatories (see Section 2.5.3). For these user groups, there are signed agreements that lay the groundwork for whatever enforcement might be needed.

All commercial tours on Mauna Kea are contractually controlled by their permit requirements. Commercial permits set use limitations and other operational requirements, for example, minimum liability insurance coverage, size and number of passenger vans, and hours of operations. They also provide for penalties when permit conditions are not met. Permit non-compliance can result in revocation of a commercial permit. Permits are reviewed and granted annually. Visitors with commercial tours are under the supervision of their tour operators. Their movements and behaviors, relative to summit resources and other visitors, are managed by their driver or other tour staff. Commercial visitors are observed behaving poorly infrequently. The operators are highly motivated to address behavioral and any other problems to maintain their commercial operation.

Film permittees are also required to enter into agreements with OMKM. Their proposed activities are clearly spelled out in advance and must abide by certain conditions, such as staying on the road, not hiking on the *pu'u*, and prohibition on the use of lights after sunset if filming in the summit area. For safety and logistic purposes film permittees may be required to hire a ranger to accompany the film crew while on Mauna Kea. Deviation from the terms of the permit or behavioral issues can result in termination of the permit.

Individual observatories and their personnel operate under sub-leases and operating site development agreements to the University and must be in compliance with their Conservation District Use Permits. Where observatory-related activities are concerned, each of the observatories is responsible for the behavior of their employees and contractors. This means that they must ensure that their personnel know what is required of them. Observatory vehicles are clearly marked and numbered so that speeding or other inappropriate road activity can be reported to supervisory staff. Incidents are reported to OMKM and MKSS, who then report them to each observatory for internal action. Each observatory is expected to notify the OMKM, MKSS or rangers if any of their operations are expected to impact the road network. For example, if the public's use of the roads is temporarily affected by observatory construction activities or movement of large equipment, the observatories must ensure that MKSS and the rangers are aware of this and can inform the public.

Altogether, commercial visitors, observatory personnel, and film permittees represented approximately 70% of the travelers to the summit region in 2008. Their activities are subject to enforcement by permit terms and contracts, and it is in their long-term interests to remain in good standing with the University and BLNR. Contractual compliance encourages self-regulating behavior, and the University has the opportunity to amend and update requirements when contracts and sub-leases are up for review.

4.4 Situational Enforcement

Situational enforcement involves engaging an additional level of enforcement presence, in addition to the rangers, when high levels of public activities are anticipated. For the last five to six years, OMKM has contracted the services of special-duty police officers to provide assistance, primarily on weekends when people are attracted by the prospect of good snow conditions. Officers are also contracted on evenings when large crowds are expected for special astronomical events such as meteor showers.

The challenge of managing public activities in the summit region increases after periods of heavy snowfall. Contracted special-duty police officers have the authority to arrest, detain and cite visitors as needed. Officers are often stationed at the road blockade at Hale Pōhaku prior to the road being cleared

and determined safe for public use. Once the road is opened, the officers assist throughout the summit area.

Rangers report that the presence of a uniformed special-duty police officer has a noticeable impact on calming the crowds and controlling inappropriate behaviors. Over the last four years, special-duty officers have been contracted from three to ten times per year, and their assistance prevents the rangers and other VIS staff from being overwhelmed by the demands of crowd control, freeing them to provide other essential services, such as education regarding health and safety. Situational enforcement is a necessary option for special events likely to attract large crowds (e.g. snow days, astronomical events).

4.5 Collaborative Enforcement

Collaborative efforts with other Federal, State and County enforcement authorities are another way in which the Mauna Kea Ranger program can expand its enforcement capacity.

DOCARE's enforcement capacity is spread thinly over hundreds of thousands of acres on Hawai'i Island and there is limited staff to provide timely response to infractions in remote areas such as Mauna Kea. The rangers provide a daily presence not only in the UH Management Areas but also in the adjoining Mauna Kea Ice Age NAR and the Mauna Kea Forest Reserve and Game Management Area. DOCARE officers expressed their appreciation for the "eyes and ears" that the ranger program has brought to the mountain and acknowledge their own limited availability to respond to violations that occur there. They see benefit in further collaboration and are open to providing more frequent training to the rangers in techniques and the process of observing and reporting violations.

As with DOCARE, HCPD's ability to respond in a timely manner to incidents in the summit area can be severely limited. In the past both HCPD and DOCARE have responded to traffic accidents and law violations at the request of the Mauna Kea staff. Response time can vary from a matter of minutes to hours depending on the location of officers. Neither DOCARE nor HCPD can consistently provide timely enforcement support to the rangers, but both are obligated to respond to requests for assistance. HCPD indicated willingness to collaborate with the ranger program and to provide training in how to file complaints or report violations. Training opportunities are also available with the ranger program at Hawai'i Volcanoes National Park (HVNP).

Enforcement of existing laws, rules and regulations applicable in the UH Management Areas is carried out by State and County law enforcement agencies. These agencies recognize the benefits of having trained rangers capable of intervening at the lowest level of control possible and making accurate reports when violations occur that will require their investigation.

4.6 Primary Law Enforcement

Primary law enforcement authority is what a police or DOCARE officer or National Park Service enforcement ranger is trained and authorized to deliver. They are sworn officers of the law with the capacity to detain and arrest perpetrators. They have the ability to carry and use weapons and are extensively trained in dealing with and utilizing physical force to protect public health and safety and to enforce the rule of law. Law enforcement officers are also trained to defuse situations and to avoid escalation. Law enforcement officers require significant and ongoing training.

Mauna Kea Rangers currently lack the legal authority and training to assume the role of primary law enforcement officers. If at some point, the University believes that this kind of authority is needed to control public activities in the UH Management Areas, there will need to be significant retraining or hiring of qualified staff, and a budget to build capacity and operate. A system will need to be developed for issuing citations, enforcing rules, collecting fines and administering due process. Training and back up support are essential to protect the safety of officers and to ensure that they are fully capable of handling every situation from a simple traffic citation to misconduct.

4.7 Summary of Methods

In summary, there is a range of control methods available for managing public access in the UH Management Areas. It starts with ongoing efforts to promote a sense of personal responsibility on the part of the public. Educational and interpretive efforts inform and reinforce personal responsibility. Rangers provide an active presence to monitor public use and help to preempt inappropriate behavior. Contractual controls and situational hiring of special duty officers provide additional legal authority for selected user groups and at times when public use is particularly intense. DOCARE and the HCPD both have legal authority to enforce public rules and laws in the UH Management Areas but response times are an issue. These enforcement agencies can, however, work collaboratively with the University to deliver or supplement enforcement authority when it is needed. Developing on-site primary law enforcement capacity is an additional, although expensive, alternative that can be pursued as conditions dictate. The University was granted rule-making authority by the State Legislature in 2009. Rules will formalize many of the operational guidelines that are in place to manage public activities in the UH Management Areas. Compliance with newly adopted rules will require a combination of all of the management approaches discussed above.

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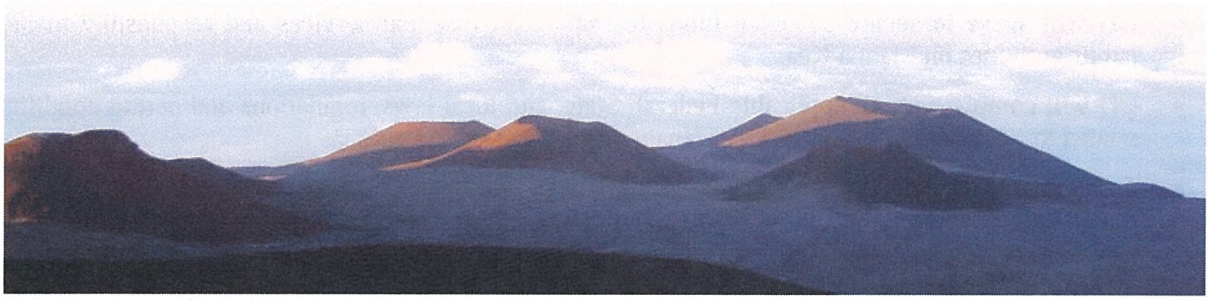


5 Principles and Policies

The following are Principles and Policies to guide the development of management actions relating to public and commercial activities and eventual administrative rules in the UH Management Areas on Mauna Kea. They are the product of interviews, roundtable discussions and extensive research and review of relevant laws, DLNR rules and regulations, planning documents, reports, and literature on outdoor recreation resource management.

To aid in the distinction between **Principles** and **Policies**, the following definitions apply:

> **Principles** are comprehensive or fundamental doctrines or assumptions.
>
> **Policies** are defined courses or actions to guide and determine present and future decisions.

5.1 Guiding Principles

- UH management *kuleana* on Mauna Kea includes a mandate to protect resources; a responsibility to manage activities and uses; and an obligation to regulate activities and uses to achieve resource protection.
- The UH Management Areas and the unique resources within them are part of the "Public Land Trust" to be managed as public resources.
- The highest management priorities for public access in the UH Management Areas are public health and safety and the conservation of natural and cultural resources.
- Traditional and customary rights of Native Hawaiians will be preserved and protected.
- Public access management will be based on the objective analysis of public activity data, information collected to monitor the status of resources, and the documented impacts associated with public activities.
- Regulation and management of activities in the UH Management Areas will strive to be consistent with the policies and practices in effect for adjacent lands under State jurisdiction.
- The principles of "adaptive management" will guide the development of management policies, actions and regulations.[1]
- Conditions conducive to scientific research activities, including astronomical research, will be protected and maintained.

[1]Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of past and current management activities (see adaptive management discussion in Section 6.4).

- UH will strive to secure adequate funds to implement essential services and responsibly manage public activities on Mauna Kea.
- UH will comply with all applicable Federal, State, and local laws, regulations and permit conditions related to public activities in the UH Management Areas.
- Traditional and customary Native Hawaiian practices will be subject to reasonable regulation of such rights as permitted by law.

5.2 Access Policies

General

- Public access rules will be subject to review and approval by BLNR.
- UH will maintain adequate personnel to provide effective management of the UH Management Areas.
- Ranger and VIS staff and volunteer training programs will be sustained and enhanced to ensure high quality interpretive capacity, public safety response, and constructive relationships with all user groups.
- Signage will be designed and implemented subject to review and approval by BLNR, to guide the use of established trails, promote public safety, and enhance interpretation and protection of historic, cultural and natural resources.
- UH will ensure representation of the broad range of public interests in its advisory bodies, and will consult with user groups that may be affected by proposed actions.
- Surveys of public users will be conducted to define and monitor the quality of the public experience in the UH Management Areas.
- The UH Management Areas will be formally designated as an Alcohol and Drug-Free Zone, excluding designated areas within the staff support facilities at Hale Pōhaku.

Public Safety and Emergency Response

- Road safety (including adequate parking) for all users on the Summit Access Road will be a high management priority.
- Public access to the summit region will be limited when road, weather conditions and crowds create conditions that are hazardous to public health and safety.
- Educational initiatives to improve public safety and raise public awareness will be developed to address the increase in public activities during snow periods.
- UH will incorporate risk assessments and responses into its management.
- UH will maintain cooperative arrangements with emergency-response agencies capable of providing services on Mauna Kea.

Education and Interpretation

- The primary interpretive goal is to instill a sense of wonder and respect among all visitors, employees and island residents for Mauna Kea's natural, spiritual, cultural and scientific resources.
- Educational outreach and advisories regarding health issues associated with Mauna Kea's high elevation environment are a high priority.

- VIS programming and displays are essential elements of the public experience on Mauna Kea and will continue to evolve to meet the needs of the public.
- Off-site outreach using multi-media and collaborative educational programs will be encouraged to raise public awareness of safe and informed behavior when visiting Mauna Kea.

Traditional and Customary Activities

- Guidelines for Native Hawaiian cultural practices on Mauna Kea will be developed in consultation with cultural practitioners and the Native Hawaiian community.
- The exercise of Native Hawaiian cultural practices is a legally and constitutionally-protected right and UH will safely accommodate individuals and groups wishing to exercise such traditional practices or customs, subject to the reasonable regulation of such rights as permitted by law.

Commercial Activities

- UH will follow DLNRs "Policy for Commercial Activities on State Owned and Managed Lands and Waters" in the UH Management Areas.
- UH will continue to regulate commercial activities and enforce permit conditions to ensure that commercial entities operate safely and appropriately in the UH Management Areas.

Enforcement

- A range of public control and enforcement options will be used to ensure public safety and resource protection.
- Compliance with rules will be sought at the lowest levels of control using education, communication and collaboration.
- Additional law enforcement capacity will be developed as needed.

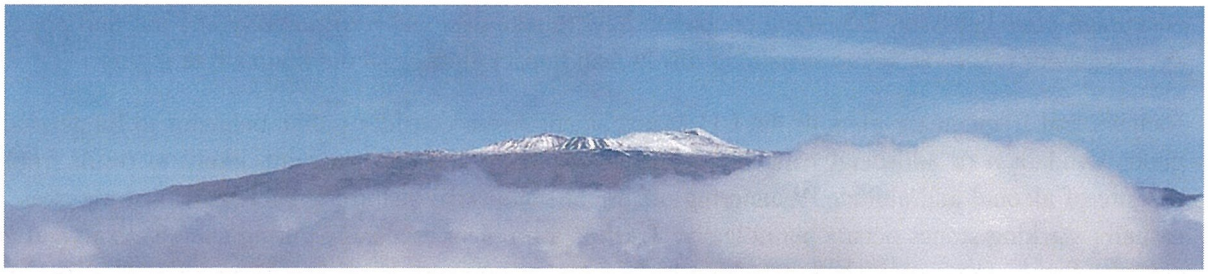
Infrastructure

- The VIS facilities should adequately accommodate current and anticipated visitor needs (e.g., interpretive and stargazing facilities, parking and comfort stations).
- UH will assess current and future infrastructure needs in the summit area to provide public support facilities as need and opportunity arise.

Monitoring and Management of Human Impacts

- Public activities will be encouraged at lower elevations in order to limit traffic to the summit region, protect public safety and health, and minimize human impacts on cultural and natural resources.
- Public activities will be encouraged to remain in already disturbed areas.
- Public hunting is allowed and subject to State laws and DLNR rules and enforcement.
- UH, in cooperation with DLNR, will monitor public activities on mutually agreed-upon trails and institute management initiatives to ensure their appropriate use and protection.
- Monitoring will be conducted to identify impacts, if any, on natural and cultural resources resulting from peak visitation during snow play periods.

- Data collected on the public's activities and the quality of the visitor experience in the UH Management Areas will be integrated with natural and cultural resource monitoring data to form the basis for ongoing adaptive management decision-making.



6 Issues and Recommendations

The in-depth interviews and roundtable discussions conducted as part of this planning process yielded valuable insights into issues and suggestions for solutions relating to public access in the UH Management Areas on Mauna Kea. Participants were knowledgeable people who have been thinking about these issues for a long time. Most interviewees and roundtable participants live on Hawai'i Island and feel a daily connection to Mauna Kea in some way. Although not everyone agreed on everything, many felt that much of the past public discourse about Mauna Kea's plans and projects did not lend itself to collaborative and constructive thinking. There was a sense that we can, and must, explore new avenues for collaborative dialogue outside of the often provocative public hearing settings. This section incorporates the many good ideas and suggestions received from plan participants[1], integrating this collective wisdom with other source materials to formulate recommendations relating to public access. It is not the intent of this plan that all of these be implemented, but rather the best ones be chosen depending on the management priorities, situation, availability of funding, and monitoring results.[2]

6.1 Education

People of widely divergent points of view find common ground in their support of educational efforts. Plan participants unanimously emphasized the need for a more informed public on the summit. Education is viewed as the key to raising people's awareness of the health issues, natural resources and cultural importance of the area, and what it means to be "respectful" on *ka mauna a Wākea*[3]. There is strong agreement that desirable behaviors are most likely to occur when clear information and guidance is provided.

Promoting *Pono* Behavior

Many plan participants used the term "*pono*" to define the way in which they would want people to behave on Mauna Kea. The term describes an attitude of humility that is reflected in behaviors that are respectful of natural and cultural resources, attentive to cultural values that regard the mountain as a temple, aware of the importance of quiet reverence while in this temple, and willing to take personal responsibility for one's actions. Roundtable participants were keenly interested in identifying ways to

[1] "Plan participants" are all those who were interviewed, part of roundtable discussions, or spoken with in the course of information gathering. A list of plan participants is included in Appendix C.

[2] Any future project within the UH Management Areas that has the potential to have an adverse impact will require the preparation of an EA or EIS under the National Environmental Policy Act (NEPA) and/or HRS Chapter 343, Environmental Impact Statements and HAR Section 11-200, Environmental Impact Statement Rules.

[3] As expressed by one of the roundtable participants: "When we go to the summit, we receive knowledge, clarity, inspiration, and *Aloha* from this special place. What does our mountain get in return? How is *Aloha* being reciprocated? How does *ka mauna a Wākea* benefit from us being there?"

encourage *pono* behavior. Educating people on how to take personal responsibility and put into practice *pono* behavior is seen as key to sustaining low human impact throughout the Mauna Kea region.

Rangers and frequent travelers to the UH Management Areas consider public behavior to be generally good. Vandalism or antisocial behavior occurs infrequently and appears more likely to result from a mixture of alcohol and altitude. Wandering off established trails, disturbing habitats or historic sites, or casually stacking stones occurs periodically. Trash is a problem especially during snow season, and unsafe driving is frequently observed. Managing these specific types of behavior will be an ongoing challenge and can be addressed with improved awareness programs, signage and continued management efforts by the rangers and other staff.

Educational issues and suggestions that were shared by plan participants include:

- Education should begin prior to people arriving on the mountain. People need to be better prepared ahead of time. A few may actually rule-out a trip to the summit if they understood how the health advisories apply to them or their companions. Outreach programs in schools and communities and local media involvement could be improved. *Kūpuna* (elders) are needed to help improve the content and effectiveness of the Hawaiian cultural message. 'Imiloa Astronomy Center could be a venue where people can learn about proper preparation for and behavior while visiting Mauna Kea. Several observatory staff expressed interest in receiving more cultural education. The accuracy and quality of information available to tourists via hotels, time shares and commercial tours could be improved.
- An FM station could be set-up to broadcast short and concise messages once people leave the Saddle Road and proceed up towards Hale Pōhaku. A wide variety of messages could be conveyed this way, i.e. road closures, safety and responsible behavior reminders and upcoming events.
- Once people arrive at Hale Pōhaku, the gateway to educational delivery is the VIS. More people can be encouraged to stop at the VIS by increasing its visibility through markings on the road and signage. However there are concerns that the VIS could easily be overwhelmed, as its space for educational exhibits, people and parking is already limited. Mandatory orientation programs, such as those recommended in the CMP, should be made available prior to arrival at Mauna Kea. This is essential due to the VIS' space and parking limitations. There is no broad support for a mandatory orientation at this time, and most plan participants favor use of non-mandatory, educational improvements (see Section 4.2).

Recommendations

- Encourage programs in the community that will help people to decide whether a trip to the summit region is appropriate for them and/or to be better prepared for a visit to Mauna Kea. Topics should include *pono* behavior, health and safety, and natural and cultural resource protection.
- Support provision of adequate facilities (including parking) and programs at the VIS to meet the needs, as numbers of visitors increase.
- Set basic interpretive guidelines and incorporate them into commercial tour, film, and other permits.

- Develop a specific communications plan to inform visitors on peak snow days regarding road safety, parking, health advisories, trash and basic summit etiquette
- Seek guidance from Kahu Kū Mauna in the development of an interpretive program to promote Hawaiian cultural education and *pono* behavior.
- Develop curriculum for rangers, VIS staff, and other interested employees regarding Native Hawaiian cultural practices and beliefs that they should be aware of when working on Mauna Kea.

6.2 Interpretation and Signage

Interpretive programs and signage are essential tools for educating the public, used around the world to protect sensitive areas and resources. A comprehensive approach to interpretive and safety messages and design can produce quality displays, brochures and signage with key information in just the right location to inform the visitor experience. Mauna Kea is an area visited by people from all over the world, so hazard warning and road safety signage should be more graphic and less language based. Well-designed, comprehensive and coordinated signage could be an affordable, relatively quick means of achieving improvements in public behavior and safety.[4]

A sample of signage on the Summit Access Road

Hazard warning signs and road safety signs have been erected through the years on an as-needed basis. They are a mixture of designs and colors and some are weathered and faded. In this inherently hazardous environment subject to rapidly changing weather conditions, it is impossible to eliminate all risks, but hazard warnings in the form of approved signage, handouts, flyers, sign-in sheets and visitor orientation are the primary means available to the UH by which to adequately warn all who enter the areas under its management.

In full cooperation with DLNR all trails that are appropriate for public use should be identified and marked noting the trail's beginning and length. There are many examples of trail markers that have been designed with safety and aesthetic considerations in mind. With simple trail signs people are less likely to get lost or stray from established trails.

Not everyone pays for a guided tour or stops at the VIS or 'Imiloa Astronomy Center to read indoor educational exhibits or watch videos. However a well-placed, attractive sign in the outdoors might capture people's attention when other educational methods have been missed. The new interpretive signs at the Waipi'o Valley Lookout were mentioned by several people as a good example of interpretive signage. These signs are low to the ground, written in English and Hawaiian, contain interesting historic photos

[4] The American National Standards Institute, an organization that sets safety standards for warnings, indicates that warning signs should have no more than 10 words because the public rarely reads long informational signs. Knowing this about human behavior all safety, directional and interpretive signage should be carefully designed and briefly worded in order to be effective.

and brief information, talk about respectful behavior and inform people of the cultural and environmental specialness of Waipi'o Valley.

Recommendations

- Develop and implement signage plan(s) based on risk assessment and comprehensive review of hazard warning, directional, and interpretive signage currently installed and/or needed throughout the UH Management Areas. Signage plans should consider adjacent areas that are being accessed via UH Management Areas, such as Pu'u Kalepeamoa in the FR and Lake Waiau in the NAR. All signage plan(s) should be developed in cooperation with DLNR and reviewed and approved by the BLNR.
- Prepare and implement an interpretive strategy for the summit region in a collaborative effort with DLNR, 'Imiloa Astronomy Center, Kahu Kū Mauna and others.

6.3 Resource Protection

Mauna Kea's natural, cultural, and scientific resources must be protected. This is expressed in numerous documents, mandated in all approved plans and agreements, rules, regulations and recommendations and agreed to by many plan participants. These are public resources to be protected for present and future generations.

Natural Resources

The NRMP contains detailed information regarding Mauna Kea's natural resources and threats to these unique resources, and makes specific recommendations for their protection and management. Natural resource concerns connected to human impacts that were mentioned by plan participants include:

- the inadvertent introduction of invasive plant and arthropod species on the shoes of hikers, on tires and interiors of cars and other vehicles, and on food items;
- unknown impacts of snow play on the wēkiu bug which lives in loose cinder and is known to frequent the edges of snow where it is melting in search of food;
- the impacts when people wander off of established paths, causing a proliferation of new paths, accelerating erosion, multiplying the potential impacts on wēkiu habitat and potentially spreading invasive species; and
- the need to strictly prevent recreational off-road vehicles from accessing the UH Management Areas.

Historic and Cultural Resources

The CRMP contains detailed information regarding Mauna Kea's historic and cultural resources and their significance and makes numerous recommendations for their protection and management.

Hawaiian cultural issues abound on Mauna Kea. Many Native Hawaiians were interviewed and participated in the roundtable discussions. They were passionate in their views and eager to express their *mana'o* (thoughts) about issues and possible solutions. A process is needed that brings Hawaiians together to discuss and resolve emotionally charged issues relating to Mauna Kea.

After many discussions and interviews, a number of cultural issues were identified:

- Should the historic sites that have been left by ancestors be strictly preserved in their current condition? What about the view that Hawaiian cultural practices are not static and alteration of those historic sites are expressions of a living culture?[5] Should foreign materials (organic and non-organic) be brought to Mauna Kea and left there as part of ceremonies? How long should those materials remain? Who should be responsible to dispose of those materials and how?

- How can Native Hawaiians reconcile their beliefs that the summit is a sacred place where few people traditionally ventured without having a clear reason (*kuleana*) for being there with the current realities, i.e., 13 fully operational observatories, and a road enabling thousands of visitors and island residents to access the summit area for daily sunset-viewing, stargazing, and snow play?

Not only Native Hawaiians await resolution of such questions. The Mauna Kea Rangers are unsure of what to do about ceremonial food items that are left to attract ants and other scavengers. They await guidance from Hawaiians about shrines and altars that contain materials that are foreign to the Mauna Kea region, such as coral stones, carved stone images, crystals, coins, etc. Protocols for disposition of non-Hawaiian ceremonial offerings are also needed. Although alteration of existing and well-documented archaeological sites is a violation of Hawai'i's Historic Preservation Law (HRS Chapter 6E), and all existing rules and recommendations for Mauna Kea forbid it, land managers and archaeologists are unsure of what to do about restoration of altered sites. People are looking to the Hawaiian community for guidance and are apprehensive about taking action that might be culturally offensive.

Scientific Resources

The scientific opportunities that Mauna Kea presents are world class. Attention is focused on Mauna Kea, Hawai'i Island and the State of Hawai'i from all over the world as a result of the scientific opportunities that coalesce in the Science Reserve. For the period in which this science is to be conducted on Mauna Kea, there are sound reasons to actively protect the investments and the environment upon which this science, and its search for knowledge, depends. The astronomy community expressed in several interviews that they do not see value in restricting public access to the summit on their account. Instead they invited the public's interest in what they do and in the nature of the information they collect.

Recommendations[6]

- Conduct research on the interface between snow play and the wēkiu bug.
- Encourage the VIS to install boot scrapers and educational displays that explain how to prevent the introduction of invasive species.
- Request guidance from Kahu Kū Mauna for the culturally appropriate removal of ceremonial food offerings as well as removal of non-Hawaiian ceremonial materials.
- Work with Kahu Kū Mauna to develop an ongoing, inclusive process by which Native Hawaiians can develop guidelines and protocols that are needed for Mauna Kea.

[5] It is a violation of Hawai'i's Historic Preservation law (HRS Chapter 6E) to take, appropriate, excavate, injure, destroy or alter any historic property on lands owned or controlled by the State or any of its political subdivisions, except as permitted by DLNR.

[6] More resource protection recommendations are contained in the NRMP and CRMP. See table in Appendix A.

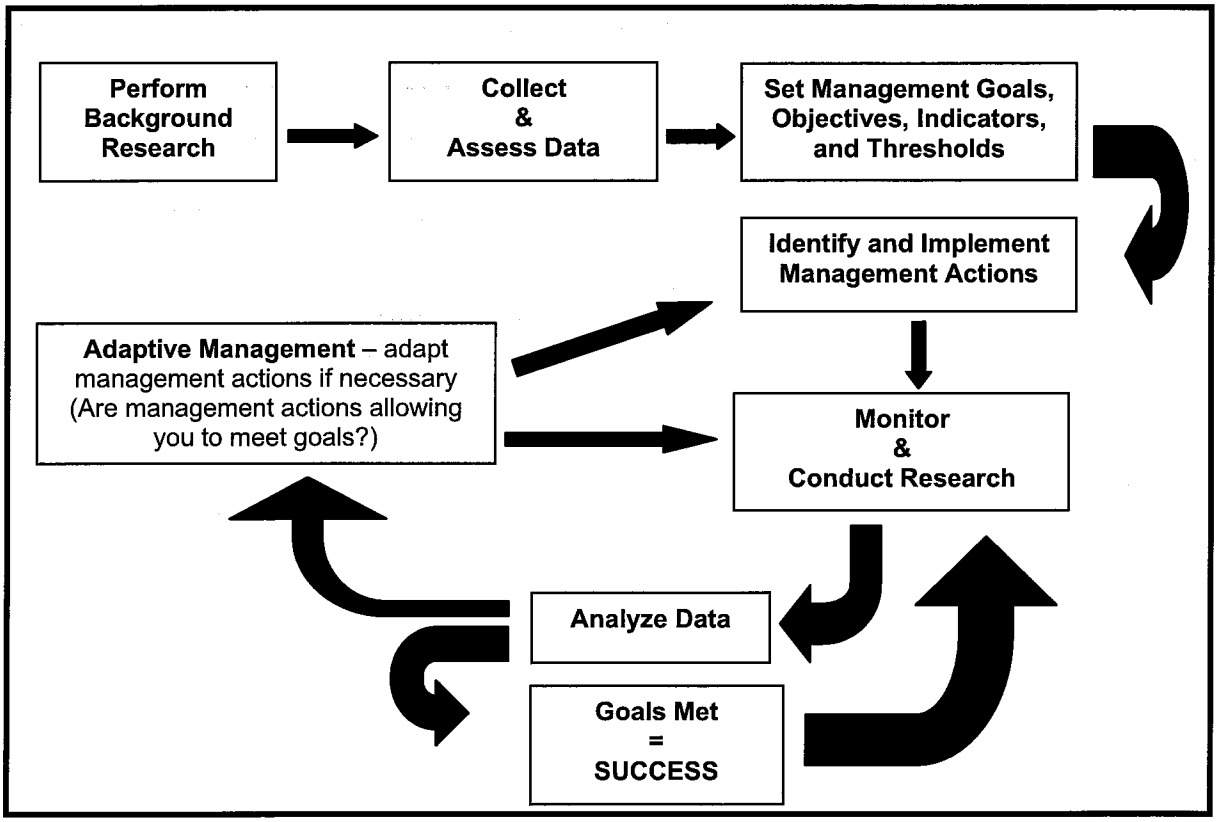
- Improve management of all trails being used by the public in the UH Management Areas, including trails on Pu'u Kalepeamoa and other trails leading into the FR from the VIS. All trail management plan(s) will be developed in cooperation with DLNR and reviewed and approved by BLNR.

6.4 Monitoring Human Impacts

Rangers and VIS staff report that public activity in the UH Management Areas appears to be steadily increasing. This may be the result of greater awareness generated by national and local media and improvements to the Saddle Road. Mauna Kea is increasingly recognized as one of the must-see destinations in Hawai'i.

The data that are gathered by rangers on summit visitation are recorded in a database. Data gathering techniques continue to improve and will become increasingly helpful as needs for data are clarified. Data is essential to objectively and accurately determine the numbers of people and their impacts. Management actions should ideally be based on actual data, and the data also helps in the assessment of whether management actions are succeeding. For example, data collection designed specifically for high visitation on snow days could be a useful tool in determining what indicators (vehicle counts, parking availability, crowd density, traffic flow, etc.) best define unsafe conditions and at what point reasonable public safety is compromised.

Figure 6-1. Adaptive Management: A Cyclic Process



Many plan participants referred to the need to determine Mauna Kea's "Carrying Capacity"[7] with regards to crowds and traffic particularly on snow days and the need to be prepared for the management challenges of increasing numbers of people. Carrying Capacity is a widely recognized and accepted concept that serves as the conceptual basis for several resource management frameworks,[8] which are extensively described in the literature and being tested worldwide in parks, forests and other natural areas open to public use. The CMP recommends "Adaptive Management" as a "systematic process for continually improving management policies and practices by learning from the outcomes of past and current management activities" (see Mauna Kea CMP Section 2.2.2) Figure 6-1 generally illustrates the adaptive management process as it would be used by land managers. Throughout this plan the importance of basing (and adapting) management actions on reliable data is emphasized. Using peak attendance snow days as an example, specific and measurable indicators would be identified for systematic data collection (i.e., numbers of cars that continue above Hale Pōhaku; numbers of cars parked outside of designated parking areas and obstructing two-way traffic; numbers and types of health and traffic incidents). Managers would analyze the data and determine whether corrective or preventive actions should be taken. Realistic management goals and objectives would be set and data would continue to be collected in order to determine whether the management actions are achieving the desired results. Management actions would be adapted until management goals are met. Monitoring of human impacts through effective data collection will support the adaptive management process and promote understanding of what Mauna Kea's carrying capacity is for public impacts.

Recommendations

- Using the adaptive management process, identify the types of data and monitoring that are needed; develop a strategy for data collection; set-up monitoring programs and define benchmarks that will inform managers when more stringent access control methods for Mauna Kea are needed.
- Use trained volunteers and other personnel (in addition to Mauna Kea Rangers) for data collection, user surveying and monitoring programs, as needed.
- Develop a comprehensive counting system for vehicles and people to improve data on visitation to the UH Management Areas.
- Correlate public activity and impact data with other cultural and environmental resource monitoring activities to inform adaptive management initiatives.
- Improve data collection on heavy snow play days to monitor areas of significant activity and develop indicators of impact to be used in future management actions.
- Conduct user surveys with all sectors of the public to track the quality of the public experience and evaluate the impacts of interpretive and management initiatives in the UH Management Areas.

[7] "Carrying Capacity" refers to the amount and type of use that can be accommodated in a particular area over time while sustaining desired resources and opportunities for quality visitor experiences (Lime et al. 2004).

[8] Major recreation resource management frameworks in use today and based on the concept of carrying capacity include: "Recreation Opportunity Spectrum," "Limits of Acceptable Change," "Visitor Experience and Resource Protection," "Visitor Impact Management," "Visitor Activity Management Process," and "Benefits Based Management" (Moore et al. 2003)

6.5 Attributes of Public Access Control

Section 4 of this plan discusses a range of approaches to providing public access control in the UH Management Areas. These approaches were shaped by the interviewees and were discussed in the roundtables. All of the methods are used on Mauna Kea and they will continue to be used in the future. The challenge is to choose the right method or combination of methods for each situation and to deliver it effectively.

The predominant sentiment of those interviewed was that the rangers currently do an excellent job of managing public activity, approaching people in a helpful manner, providing information and actively monitoring and responding to health and safety conditions. Mauna Kea Rangers operate much like an interpretive ranger does in national parks. They do not have police powers, but manage behavior in educational ways.

Several interviewees expressed concern that a permanent police-type presence on the summit sent an inappropriate message about the nature of UH's management presence, particularly given the infrequency at which such authority might need to be exercised. This issue is likely to be revisited in the future, but at this time there is a sense that the preferred authority level is one that seeks compliance with rules and protocols by first using the lowest level of control available.

Recommendations

- Per Act 132 (2009), initiate rule adoption procedures under HRS Chapter 91 to formalize existing guidelines and practices, and, where appropriate, bring consistency between the rules of the UH Management Areas and those of the various DLNR agencies that manage lands in the upper elevation area of Mauna Kea.
- Develop formal collaborative enforcement relationships with HCPD and DOCARE through cooperative agreements or other means to strengthen the partnerships needed for effective response.
- Update and clarify procedures and communications with the Hawai'i County Fire Department and PTA Fire Department to ensure prompt and ongoing emergency response support in the UH Management Areas.
- Utilize training opportunities for the rangers that are available through HCPD, DOCARE and HVNP, as well as other training opportunities that arise in the community.
- Study the feasibility of developing limited citation authority for Mauna Kea Rangers.

6.6 Access Controls

There has been much discussion about the extent and methods by which managers need to control public access to the summit with a gate or other control measures. The CMP specifically recommends several management actions that have raised questions and concerns for the public:

- "Require orientation of users, with periodic updates and a certificate of completion, including but not limited to visitor, employees, observatory staff, contractors, and commercial and recreational users."

- "Maintain a presence of interpretive and enforcement personnel on the mountain at all times to educate users, deter violations, and encourage adherence to restrictions."

People tend to read these statements and conclude that the CMP is proposing major changes (i.e. a locked gate and permit system) to public and Native Hawaiian traditional and customary access to commence soon. These management actions could be implemented in a variety of ways, and the PAP is recommending a range of control methods that are supported by documented conditions in the field.

Some people who engage in cultural practices in the summit region had strong reactions to these recommendations. They resented the idea that land managers or rangers would block their way to the summit and require them to take a class before obtaining access to the areas where they practice their cultural traditions. Many saw a gate as symbolizing an attitude of exclusion, un-Hawaiian and unwelcoming. Others had less trouble with a gate and saw it as a way to signal a new type of behavior that might be required above it. Several observatory staff emphasized that the observatories do not want public use of the Summit Access Road restricted. They view the road as public and do not want suggestions of restricting public use of the road to be attributed to the observatories. Virtually all interviewees felt that a gate or other road blockage was appropriate when public health and safety might be at risk from road or weather conditions.

Rangers and the most frequent summit road users saw the concept of a control gate and mandatory educational requirements in practical terms. Staff would be needed to man the gate and a kiosk would be needed to protect the staff in severe weather. Enforcement authority would also be needed to apprehend anyone who refused to stop. Facilities to conduct mandatory educational programs are not currently available at Hale Pōhaku, and the staff needed to conduct such orientations is not always available. Some wondered about the advisability of taking such a strict approach before other, less controlling methods were attempted, such as interpretive and directional signage and off-site educational programs. The adaptive management process provides the framework for identifying less controlling methods, studying their effectiveness, and adapting management actions accordingly. The adaptive management process helps to provide the rationale for management decisions. The capacity to manage a mandatory system with an enforcement presence could be developed over time with additional capital, as the need for that level of control becomes clear.

Given the nature and extent of current public activity and the costs and potential conflict that would be associated with gating the Summit Access Road, requiring all visitors to receive orientation does not appear to be justified at this time. There are other less expensive, and perhaps more effective, approaches to encourage appropriate behavior that should be explored before installation of physical barriers and mandatory requirements are instituted.

Visitor Shuttles and Alternative Transit

Many national parks and other public areas around the world are shifting away from private vehicles in favor of centrally operated shuttle buses to take visitors to sensitive areas. Many people interviewed for this report felt strongly that use of individual cars are putting an undue burden on the summit's environment. One idea is to establish an area nearer to the Saddle Road with improved interpretive facilities[9] where visitors would be required to board some form of transit system in order to visit the summit. Others advocated an optional shuttle from Hale Pōhaku to the summit for both visitors and

[9] The former Humu'ula Sheep Station on DHHL lands was frequently mentioned as a possible location for a shuttle service. DHHL's current planning process for their Humu'ula/Pi'ihonua lands entitled "'Āina Mauna Legacy Program," contains many ideas for potential commercial use of that ~15 acre site.

observatory employees, as it is felt that many people would prefer not to drive the Summit Access Road if given an alternative. There is uncertainty regarding the cost of implementing or whether sufficient revenue can be generated to support such a service. There is also a question as to whether the public would embrace this alternative, especially those who want to take their trucks to collect snow. The observatories are looking into the cost-benefit of shuttle alternatives, particularly for day crews who drive from Waimea or Hilo. However, skepticism was also expressed that varying observatory work shifts will not lend themselves to a shuttle system, as well as concerns about safety in event of emergencies. Determining the specific, measurable benefits and social acceptance resulting from this effort will be key to justifying the expense involved.

A transit system alternative is a major consideration in managing public access. It would require the construction of new parking areas and a rider fee or a public subsidy to fund the service. Commercial tours already provide this service for 45% of the summit visitor count. Observatories have unique travel needs and are in discussion amongst themselves to explore shuttle operations for both day and night operations. With some additional commercial incentives or public subsidy there may be sufficient synergy to offer a private sector shuttle service in the future that serves multiple sectors of the summit user mix.

Recommendations

- Improve signage and road markings to encourage all visitors to stop at the VIS to adjust to high altitude conditions and receive information prior to proceeding to the summit.
- Explore methods to divert summit bound visitors by offering educational and scenic opportunities at lower elevations nearer to Hale Pōhaku.
- Study the feasibility of a self-funding shuttle service to help minimize the number of vehicles in the summit region and to reduce the use of two-wheel drive vehicles on the Summit Access Road.
- Conduct a public consultation process to review proposed management actions that may significantly change the ability of the public to access the UH Management Areas.

6.7 Accommodating Growth

How to prepare for likely future visitor growth was a frequent theme in conversations about public access to the summit. There are several subsets of this discussion: Peak Day Trends; Infrastructure Improvements; and Commercial Activities

Peak Day Trends

Snow play has been a very popular reason for visitation to the summit region for generations of island residents and it presents the most challenging of all public activities in the UH Management Areas. There are physical limitations to the capacity of the Summit Access Road to accommodate ever-increasing numbers of vehicles. The lack of off-road parking areas can compromise the safe flow of vehicles on the Summit Access Road at times of peak use. The Summit Access Road is closed to public use when snow and ice accumulate, and it remains closed until it is determined to be safe by Mauna Kea management staff. Once the road is open, however, there is no program in place to limit the number of vehicles that can be in the summit area at one time, regardless of the congestion that can develop. Such limitations to protect public health and safety are probably inevitable and will need to be developed using adaptive management methods. There is a need for a robust data collection effort to help determine the levels of

visitation that are safe and acceptable under varying snow conditions. Ranger and VIS staff need to engage in targeted efforts to monitor key indicators and provide as detailed a record of events at times of peak use as possible. This information can lay a foundation of management actions and help justify control efforts if and as they become necessary.

Traffic jam on the Summit Access Road during a heavy snow day in 2008

Infrastructure Improvements

Increasingly the UH Management Areas on Mauna Kea are being visited like a park, but support personnel and infrastructure are insufficient to manage the area as a park should be managed. In multiple interviews and the roundtable discussions people struggled with the question of whether road improvements, more restrooms, trash receptacles, and other amenities should be provided to accommodate increased numbers of visitors or whether facilities should be left in their current state which might dissuade visitors from continuing to the summit from Hale Pōhaku. To accommodate visitor growth by increasing their comfort level is to acknowledge that Mauna Kea is a visitor destination. A number of people clearly oppose this idea, others express ambivalence, while others felt it would be "embarrassing" to allow a visitor destination in Hawai'i to be seriously neglected.

Increasing numbers of independent and commercial tour visitors place additional strain on the VIS, which has already outgrown its physical space. VIS staff and volunteers operate a quality program within the constraints of their facilities, but during peak periods there is not enough space for people to comfortably view the educational exhibits, interactive displays, bookstore and videos.

Insufficient parking can discourage people from taking advantage of educational opportunities at the VIS. Concerns have been raised by several plan participants over the safety of people at night around the VIS, as people often park outside of the VIS parking lot when the 20 available parking spaces are filled. People are regularly crossing the road on foot in the dark to get to the VIS, a situation that is intensified when there are special stargazing events. Parking also becomes a safety issue during peak snow days when the public parks outside of established parking areas along the shoulders of the road, potentially obstructing

the two-way traffic flow. One of the Mauna Kea CMP's management actions is to "Develop parking and visitor traffic plan," which is also highly recommended in this plan.

Commercial Activities

Commercial visitors represent the fastest growing sector of public use on the mountain. They amount to 45 percent of the total visitor count in 2008 but only 17 percent of the total vehicle count. Tour operators generally do a good job of screening, educating and controlling commercial visitors and they contribute financially to help cover management costs. As the commercial market grows, so does the sense of crowding that comes from relatively large groups arriving at the VIS and the summit at similar times to share a similar experience. This may be a distraction for some independent visitors, and may, among other things, dissuade some from stopping at the VIS for acclimatization if it appears crowded. Better information is needed to help manage the growth of commercial tours, including the development of qualitative information to help gauge the quality of the visitor experience at peak times of day.

Permits issued by UH control commercial activities on the mountain. These permits control the peak number of commercial tours on the summit, particularly at sunset and early evening. In 2007, 88 percent of the commercial tours were sunset and stargazing related. This planning effort encountered little support for increasing the number of allowable tours during this period in particular.

OMKM grants film permits for both commercial and non-commercial movie and still photography. Much of this film activity is for documentary purposes and results in international media coverage for the science and other attractions of Mauna Kea. Film can aid in efforts to educate and prepare potential travelers prior to their arrival on the mountain. It can also promote visitation in ways that are hard to monitor. OMKM currently permits filming that is in keeping with the historic, cultural and environmental values of the summit region. These permits should continue to be granted judiciously.

Recommendations

- Maintain and improve current access control methods and procedures during severe weather and icy road conditions to protect public health and safety and summit resources.
- Improve interpretive and visitor support facilities at the VIS to accommodate current and future needs, including expansion of parking facilities.
- Develop a parking and visitor traffic plan.
- Explore ways to improve interpretive and visitor support facilities nearer to the summit using existing or vacated facilities.
- Pilot use of the roundtable discussion model as a way of identifying possible resolutions to controversial issues.
- Conduct periodic review of commercial activities and trends and amend management actions as needed.

6.8 Unresolved Issues

The recommendations in this plan have resulted from consultation with a wide range of people. However it is clear that there are important issues that will remain unresolved until more extensive dialogue can occur amongst the public and other stakeholders or more information becomes available. Also Hawaiian sovereignty and ceded land claims are legal issues of statewide concern and beyond the scope of this plan and the University's purview. Major areas of concern include:

Accommodation of Public Activities on the Summit

There are lingering concerns about the role of the summit as a visitor destination. To what degree should public visitation be tolerated, encouraged or discouraged? The UH Management Areas and adjacent lands are public property, served by a public road and have well-established recreational, cultural and scientific activities. The answers to this question affect decisions regarding (1) how much control will need to be exercised over use of the Summit Access Road; (2) whether there should be improved restroom facilities, parking, trail signage, etc. above Hale Pōhaku; and (3) how to address the growth of visitor interest in this majestic place. The lingering nature of this question reflects the diversity of values that surround the management of public activities on Mauna Kea. Open discussion of this issue may help balance management decisions in the future.

Native Hawaiian Cultural Practices

There are some lingering questions related to cultural practices that go beyond the responsibility of this plan. Questions like: What guidelines or protocols should be established for modern cultural practices, including non-Hawaiian ceremonial practices, particularly those that might leave physical offerings or other traces behind? What are the specific *pono* behaviors that should be conveyed to the general public and how best to convey them? Would it help to have a Code of Conduct for the public and how could that be instituted? Should archaeological sites be restored if they are damaged or altered? How should existing historic properties be protected? The answers to these and other questions would be welcomed by land managers and rangers working for the State and UH, as well as help to provide much-needed guidance to all user groups.

Certain cultural practices have raised questions among practitioners who have been taught differently. *"'A'ohe pau ka 'ike i ka hālau ho'okahi."* (All knowledge is not taught in the same school.) This is an example of the kind of cultural dilemma that will not be easy to resolve.

The CMP and CRMP have noted these concerns as well and have identified Kahu Kū Mauna as the Native Hawaiian advisory group responsible to initiate the processes that would lead to resolution of long-standing, controversial issues. This gives rise to a number of questions: As a volunteer council, is Kahu Kū Mauna equipped to fulfill the many assignments given to it in the plans? What kind of support will they need to tackle such weighty issues?

Misunderstandings are likely to continue in the absence of resolution of these issues. Decision-making is being hampered by uncertainty over cultural acceptability. A process needs to be initiated that will promote dialogue and positive outcomes. Participants in the roundtable discussions often noted that the facilitated roundtable approach seemed to be a good model for promoting civil dialogue and identifying common ground between people of differing viewpoints.

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7 Public Access Plan Updates

Adaptive management involves adjusting management policies and strategies as new information becomes available, and requires that management plans undergo regular review to reduce uncertainty and incorporate lessons learned. This ensures that the most effective tools are in place to protect the resources. This Public Access Plan (PAP) presents the current thinking on managing public access for the UH Management Areas on Mauna Kea. It will evolve as elements are implemented based on what strategies work and which ones do not.

Regular review of the PAP is needed to determine if its provisions are effective over time and are meeting management needs. The plan is process-oriented, and it is possible that updates will be required based on changes in operations and policies. The PAP, in particular the principles and policies, should be reviewed and updated every five years as part of the evaluation and revision process for the Mauna Kea CMP (see Mauna Kea CMP Section 7.4.2). Changes to the PAP will reflect changes in conditions noted in the Mauna Kea CMP including changes in status of natural or cultural resources that require management of public access to certain areas. Updates to the PAP will incorporate changes to DLNR rules and regulations, renegotiated leases, new management agreements, or new statutes or changes to existing laws and/or court decisions that are related to public access.

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Appendices

Appendix A. Summary Information Relating to Public Access

Appendix B. University of Hawai'i Rule Making Authority

Appendix C. Public Access Plan Participant Input

Appendix D. Correspondence from KAHEA

Appendix E. General Lease

Appendix F. DLNR Policy for Commercial Activities on State Owned and Managed Lands and Waters

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Appendix A. Summary Information Relating to Public Access

Cross-Referenced Information Relating to Public Access in CMP, CRMP, NRMP & PAP

Summary of Public Access Plan Recommendations

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Cross-Referenced Information Relating to Public Access in CMP, CRMP, NRMP & PAP

Information Relevant to Public Access	CMP	CRMP	NRMP	PAP
Impacts and threats associated with public access	6.3	4.1	3.2	2.6 thru 2.8, 3.1 thru 3.3.10, 6.1 thru 6.7
Recommendation that OMKM be given administrative control to develop, implement and enforce rules and regulations for public activities	7.2.1, 7.2.2		1.4.2.3	1.1, 1.2, 1.3.2, 2.5, 4.7, 5.1, 5.2, 6.5
Recommendation to maintain a steady presence of rangers and other personnel in the summit area	7.2.1, 7.2.2	4.1.5		4.1 thru 4.7, 5.2, 6.5
Description of cultural practices and resources	1.2, 1.3, 5.2, 5.4, 6.1.5, 7.1.1	2.3	3.1.5	2.7.2, 2.7.3, 2.7.4, 3.1, 3.3.5, 3.3.9, 6.1, 6.3, 6.8
General guidelines for minimizing negative effects on cultural resources while allowing public access	5.2.7, 7.1.1, 7.1.2, 7.1.3, 7.2, 7.3.4	4.1.1		2.5.1, 2.5.2, 4.1, 4.2, 5.2, 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8
Recommendations for protecting historic sites while allowing public access	7.1.1, 7.1.3, 7.2, 7.3.4	4.1.1		2.5.1, 2.5.2, 4.1, 4.2, 4.5, 5.2, 6.1, 6.2, 6.3, 6.4, 6.8
Recommendations focused on the desire to respect and provide access for cultural practitioners and ensure the right to participate in any and all traditional and customary practices[1]	7.1.1, 7.2.1	4.2.1		2.7.4, 3.3.9, 4.2, 5.1, 5.2, 6.1, 6.2, 6.3, 6.6, 6.7, 6.8
Description of recreational and tourism activities	6.1.3, 7.2.1		3.1.3	3.1 thru 3.3.10
Recommendations regarding the management of recreational activities	7.1.1, 7.1.2, 7.1.3, 7.2.1, 7.2.2, 7.5	4.2.3	4 (various)	4.1 thru 4.7, 5.1, 5.2, 6.1 thru 6.7
Description of commercial activities	6.1.4, 7.2.1		3.1.4	2.5.3, 3.3.1, 3.3.3, 4.3, 6.6, 6.7
Recommendations regarding the management of permitted commercial activities	7.1.1, 7.1.2, 7.1.3, 7.2.1, 7.2.2, 7.5	4.2.4, 4.2.5	4 (various)	2.5.3, 2.5.4, 4.3, 5.1, 5.2, 6.1, 6.4, 6.6, 6.7

[1] Also acknowledges the need for access by contemporary cultural practices within the parameters of protecting cultural and natural resources.

Information Relevant to Public Access	CMP	CRMP	NRMP	PAP
Recommendations on educating users about cultural and natural resources present	7.1.1, 7.1.2, 7.1.3, 7.2.1, 7.2.2, 7.3.1, 7.3.2	4.3.3	4.4	4.1, 4.2, 5.2, 6.1, 6.2, 6.3, 6.6, 6.7
Description of existing infrastructure	6.2, 7.3.1, 7.3.3		3.1.1.2	2.6 thru 2.6.3
Recommendations on methods for minimizing and managing emergency incidences, such as searching for lost hikers and evacuation of injured people, without causing detrimental effects on cultural and natural resources	6.2.5, 7.1.3, 7.4.1, 7.5	4.1.6, 4.3.5		2.6.2, 2.8, 4.1 thru 4.7, 5.2, 6.1 thru 6.7
Recommendations on methods of fire prevention, protocol in the event of a fire and restoration of fire-damaged areas	7.1.3, 7.2.1, 7.4.1, 7.5	4.3.5	4.2.3.10	5.1, 5.2, 6.5
Support and implement inventory, monitoring and research projects to establish baseline status, track changes over time and detect undesirable changes	7.1.1, 7.1.2, 7.2.2, 7.3.2	4.3.1	4.1, 4.2.2	3.2, 3.3.1, 3.3.8, 5.1, 5.2, 6.3, 6.4
Recommendations for minimizing habitat alteration due to human use and activities as well as repairing degraded habitats	7.1.2, 7.1.3, 7.2.1, 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.4.1		4.2.3.1	2.6.3, 2.7.1, 4.2, 5.2, 6.1 thru 6.7
Recommendations on preventing population decline and loss of diversity of native plants and animals	7.1.2, 7.1.3, 7.2.1, 7.3, 7.4.1		4.2.3.8	2.6.3, 2.7.1, 5.2, 6.1, 6.2, 6.3, 6.4, 6.6, 6.7
Recommendations on limiting damage caused by invasive species	7.1.2, 7.1.3, 7.2.1, 7.3.1, 7.3.2		4.2.3.7	2.7.1, 5.2, 6.3
Recommendations for minimizing erosion	7.1.2, 7.1.3, 7.2.1, 7.3.1		4.2.3.4	2.6.3, 4.2, 5.2, 6.1, 6.2, 6.3, 6.4, 6.6
Recommendations for the management of off road vehicle use	7.1.3, 7.2.1, 7.3.1, 7.4.1, 7.5	4.1.2	4.2.3.1, 4.2.3.9	2.5.2, 2.6.3, 4.1 thru 4.7, 5.2, 6.1, 6.3, 6.4, 6.5
Recommendations to guide the management and removal of solid waste/debris from construction sites and visitors	7.1.3, 7.2.1, 7.3.1	4.1.4, 4.3.4	4.2.3.5	2.5.2, 4.2, 4.3, 5.2, 6.1, 6.3, 6.4, 6.5
Recommendations regarding safe disposal of wastewater and sewage	7.3.1		4.2.3.3	4.3, 5.2, 6.1, 6.5, 6.7

Information Relevant to Public Access	CMP	CRMP	NRMP	PAP
Recommendations on how to maintain a high level of air quality	7.1.4, 7.2.1, 7.3.2		4.2.3.2	5.1, 2.5.2, 6.3, 6.6, 6.7
Recommendations regarding how to avoid increase in ambient noise levels	7.2.1, 7.3.2		4.2.3.6	5.1, 5.2, 6.1, 6.4, 6.6
Recommendations to limit the impacts from scientific research and sample collection	7.2.1	4.2.6	4.2.3.9	2.5.1, 3.3.8, 5.1, 6.3

Summary of Public Access Plan Recommendations

Education

- Encourage programs in the community that will help people to decide whether a trip to the summit region is appropriate for them and/or to be better prepared for a visit to Mauna Kea. Topics should include pono behavior, health and safety, and natural and cultural resource protection.
- Support provision of adequate facilities (including parking) and programs at the VIS to meet the needs, as numbers of visitors increase.
- Set basic interpretive guidelines and incorporate them into commercial tour, film, and other permits.
- Develop a specific communications plan to inform visitors on peak snow days regarding road safety, parking, health advisories, trash and basic summit etiquette
- Seek guidance from Kahu Kū Mauna in the development of an interpretive program to promote Hawaiian cultural education and pono behavior.
- Develop curriculum for rangers, VIS staff, and other interested employees regarding Native Hawaiian cultural practices and beliefs that they should be aware of when working on Mauna Kea.

Interpretation and Signage

- Develop and implement signage plan(s) based on risk assessment and comprehensive review of hazard warning, directional, and interpretive signage currently installed and/or needed throughout the UH Management Areas. Signage plans should consider adjacent areas that are being accessed via UH Management Areas, such as Pu'u Kalepeamoa in the FR and Lake Waiau in the NAR. All signage plan(s) should be developed in cooperation with DLNR and reviewed and approved by the BLNR.
- Prepare and implement an interpretive strategy for the summit region in a collaborative effort with DLNR, 'Imiloa Astronomy Center, Kahu Kū Mauna and others.

Resource Protection

- Conduct research on the interface between snow play and the wēkiu bug.
- Encourage the VIS to install boot scrapers and educational displays that explain how to prevent the introduction of invasive species.
- Request guidance from Kahu Kū Mauna for the culturally appropriate removal of ceremonial food offerings as well as removal of non-Hawaiian ceremonial materials.
- Work with Kahu Kū Mauna to develop an ongoing, inclusive process by which Native Hawaiians can develop guidelines and protocols that are needed for Mauna Kea.
- Improve management of all trails being used by the public in the UH Management Areas, including trails on Pu'u Kalepeamoa and other trails leading into the FR from the VIS. All trail management plan(s) will be developed in cooperation with DLNR and reviewed and approved by BLNR.

Monitoring Human Impacts

- Using the adaptive management process, identify the types of data and monitoring that are needed; develop a strategy for data collection; set-up monitoring programs and define benchmarks that will inform managers when more stringent access control methods for Mauna Kea are needed.
- Use trained volunteers and other personnel (in addition to Mauna Kea Rangers) for data collection, user surveying and monitoring programs, as needed.
- Develop a comprehensive counting system for vehicles and people to improve data on visitation to the UH Management Areas.
- Correlate public activity and impact data with other cultural and environmental resource monitoring activities to inform adaptive management initiatives.
- Improve data collection on heavy snow play days to monitor areas of significant activity and develop indicators of impact to be used in future management actions.
- Conduct user surveys with all sectors of the public to track the quality of the public experience and evaluate the impacts of interpretive and management initiatives in the UH Management Areas.

Attributes of Public Access Control

- Per Act 132 (2009), initiate rule adoption procedures under HRS Chapter 91 to formalize existing guidelines and practices, and, where appropriate, bring consistency between the rules of the UH Management Areas and those of the various DLNR agencies that manage lands in the upper elevation area of Mauna Kea.
- Develop formal collaborative enforcement relationships with HCPD and DOCARE through cooperative agreements or other means to strengthen the partnerships needed for effective response.
- Update and clarify procedures and communications with the Hawai'i County Fire Department and PTA Fire Department to ensure prompt and ongoing emergency response support in the UH Management Areas.
- Utilize training opportunities for the rangers that are available through HCPD, DOCARE and HVNP, as well as other training opportunities that arise in the community.
- Study the feasibility of developing limited citation authority for Mauna Kea Rangers.

Access Controls

- Improve signage and road markings to encourage all visitors to stop at the VIS to adjust to high altitude conditions and receive information prior to proceeding to the summit.
- Explore methods to divert summit bound visitors by offering educational and scenic opportunities at lower elevations nearer to Hale Pōhaku.
- Study the feasibility of a self-funding shuttle service to help minimize the number of vehicles in the summit region and to reduce the use of two-wheel drive vehicles on the Summit Access Road.
- Conduct a public consultation process to review proposed management actions that may significantly change the ability of the public to access the UH Management Areas.

Accommodating Growth

- Maintain and improve current access control methods and procedures during severe weather and icy road conditions to protect public health and safety and summit resources.
- Improve interpretive and visitor support facilities at the VIS to accommodate current and future needs, including expansion of parking facilities.
- Develop a parking and visitor traffic plan.
- Explore ways to improve interpretive and visitor support facilities nearer to the summit using existing or vacated facilities.
- Pilot use of the roundtable discussion model as a way of identifying possible resolutions to controversial issues.
- Conduct periodic review of commercial activities and trends and amend management actions as needed.

Appendix B. University of Hawai'i Rule Making Authority

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GOV. MSG. NO. 749

EXECUTIVE CHAMBERS

HONOLULU

LINDA LINGLE
GOVERNOR

June 18, 2009

The Honorable Colleen Hanabusa, President
and Members of the Senate
Twenty-Fifth State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

Dear Madam President and Members of the Senate:

This is to inform you that on June 18, 2009, the following bill was signed into law:

HB1174 HD3 SD2 CD1

A BILL FOR AN ACT
RELATING TO THE UNIVERSITY OF HAWAII.
ACT 132 (09)

Sincerely,

LINDA LINGLE

Approved by the Governor
on JUN 18 2009

HOUSE OF REPRESENTATIVES
TWENTY-FIFTH LEGISLATURE, 2009
STATE OF HAWAII

ACT 132

H.B. NO. 1174 H.D. 3 S.D. 2 C.D. 1

A BILL FOR AN ACT

RELATING TO THE UNIVERSITY OF HAWAII.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. Pursuant to the Hawaii Constitution and Hawaii Revised Statutes, the University of Hawaii is vested with autonomous authority to control and manage its educational and proprietary affairs. This authority extends to the use and oversight of lands and real property owned by the University of Hawaii or leased, demised, or transferred to the University of Hawaii from various owners, including state, federal, or private entities, for the furtherance of the University of Hawaii's educational, research, and agricultural activities.

Such autonomous authority presumably carries with it the necessary legal means to supervise, oversee, and permit public activities on lands it leases and controls on Mauna Kea, including the Mauna Kea Science Reserve, Hale Pohaku, and the connecting roadway corridor between Hale Pohaku and the Mauna Kea Science Reserve (collectively the Mauna Kea lands), and may be implied from the autonomous character of the University of Hawaii. Nevertheless, the purpose of this Act is to clarify and

add certainty to the law relating to the University of Hawaii's authority to manage and control public and commercial activities on the Mauna Kea lands by granting express authority to the University of Hawaii to adopt rules relating to public and commercial activities permitted or occurring on the Mauna Kea lands. In adopting the rules, the University of Hawaii shall address and reconcile any conflicts with other statutes or rules that are applicable to the Mauna Kea lands.

Administrative rules governing public and commercial activities on the Mauna Kea lands are necessary to provide effective protection of cultural and natural resources from certain public activities, and to help ensure public health and safety. Administrative rules currently in effect for the surrounding forest reserve and natural area reserve lands managed by the department of land and natural resources do not apply to the Mauna Kea lands. Examples of public and commercial activities that could be covered by administrative rules include:

(1) General access to sensitive resource areas, such as specific cultural features and identified natural resource habitat areas;

(2) Traffic and off-road vehicle management and control;

(3) Alcohol consumption;

(4) Recreational activities; and

(5) Commercial tour activities.

Access for traditional and customary native Hawaiian cultural and religious purposes shall be accommodated. The University of Hawaii shall encourage and foster a process of collaboration and involvement with the Mauna Kea lands advisory bodies and community interests to ensure that the process of developing administrative rules is accomplished with community participation and input.

The purpose of this Act is to authorize the board of regents of the University of Hawaii to:

(1) Charge fees and enter into lease agreements for the Mauna Kea lands;

(2) In consultation with the office of Hawaiian affairs, adopt rules to regulate public and commercial activities on Mauna Kea lands that are consistent with the administrative rules of the division of forestry and wildlife of the department of land and natural resources related to forest reserves and natural area reserves;

(3) In consultation with the office of Hawaiian affairs, establish and collect administrative fines for violations;

(4) Establish the Mauna Kea lands management special fund to assist the University of Hawaii in its task of regulating the use of the Mauna Kea lands; and

(5) Submit annual reports to the legislature.

SECTION 2. Chapter 304A, part IV, Hawaii Revised Statutes, is amended by adding a new subpart to be appropriately designated and to read as follows:

" . MAUNA KEA LANDS

§304A-A Definitions. As used in this subpart:

"Board of regents" means the board of regents of the University of Hawaii.

"Fees" includes rents on leases of Mauna Kea lands, moneys received for use of Mauna Kea lands, moneys attributable to commercial activities on Mauna Kea lands, and moneys received for the use of facilities and programs on Mauna Kea lands.

"Mauna Kea lands" means the lands that the University of Hawaii is leasing from the board of land and natural resources, including the Mauna Kea Science Reserve, Hale Pohaku, the connecting roadway corridor between Hale Pohaku and the Mauna

Kea Science Reserve, and any other lands on Mauna Kea that the University of Hawaii leases or over which the University of Hawaii acquires control or jurisdiction.

§304A-B Mauna Kea lands; fees; lease agreements. (a) The board of regents may charge a fee for use of the Mauna Kea lands and for the use of facilities and programs related to the Mauna Kea lands.

(b) The board of regents may enter into lease agreements for the Mauna Kea lands; provided that the University of Hawaii shall comply with all statutory requirements in the disposition of ceded lands.

(c) In establishing the fees, the board of regents shall be exempt from the public notice, public hearing, and gubernatorial approval requirements of chapter 91; provided that the fees shall be established at an open public meeting pursuant to chapter 92. The fees shall be deposited into the Mauna Kea lands management special fund established under section 304A-F.

§304A-C Mauna Kea lands rules. The board of regents may adopt rules pursuant to chapter 91 to regulate public and commercial activities on Mauna Kea lands.

In adopting these rules, the board shall:

(1) Strive for consistency with the administrative rules of the division of forestry and wildlife of the department of land and natural resources related to forest reserves and natural area reserves;

(2) Consult with the office of Hawaiian affairs to ensure that these rules shall not affect any right, customarily and traditionally exercised for subsistence, cultural, and religious purposes and possessed by ahupuaa tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights; and

(3) Hold at least one public hearing, in addition to the public hearing at which decision making on the proposed rule is made, on the island of Hawaii.

§304A-D Violations; penalties; costs; collection. (a) In consultation with the office of Hawaiian affairs, the board of regents may set and provide for the assessment and collection of administrative fines for violations of this subpart or rules adopted hereunder; provided that the fines shall be set as follows:

(1) For the first violation, not more than $2,500;

(2) For the second violation within five years of a previous violation, not more than $5,000; and

(3) For the third violation within five years of a prior violation and any subsequent violation, not more than $10,000.

(b) Each day that the violation continues shall constitute a separate offense.

(c) The costs of any enforcement proceedings, including the costs of contested case proceedings, may be assessed against a party found to be in violation.

(d) Any action taken to impose or collect the penalty provided for in this section shall be considered a civil action.

§304A-E Mauna Kea lands; reporting requirements. The board of regents shall report annually to the legislature, no later than twenty days prior to the convening of each regular session, on the Mauna Kea lands activities, current and pending lease agreements and fees, the status of current and pending administrative rules, income and expenditures of the Mauna Kea lands special fund established in section 304A-F, and any other issues that may impact the activities of the Mauna Kea lands."

SECTION 3. Chapter 304A, part V, Hawaii Revised Statutes, is amended by adding a new section to be appropriately designated and to read as follows:

"**§304A-F Mauna Kea lands management special fund.** (a) There is established the Mauna Kea lands management special fund, into which shall be deposited:

(1) Appropriations by the legislature;

(2) All net rents from leases, licenses, and permits, including fees and charges for the use of land and facilities within the Mauna Kea lands;

(3) All moneys collected for violations of subpart of part IV; and

(4) Interest earned or accrued on moneys in the special fund.

(b) The proceeds of the special fund shall be used for:

(1) Managing the Mauna Kea lands, including maintenance, administrative expenses, salaries and benefits of employees, contractor services, supplies, security, equipment, janitorial services, insurance, utilities, and other operational expenses; and

(2) Enforcing administrative rules adopted relating to the Mauna Kea lands.

(c) No moneys deposited into the Mauna Kea lands management special fund may be used by the governor or the director of finance as a justification for reducing any budget request or allotment to the University of Hawaii unless the University of Hawaii requests the reduction.

(d) The University of Hawaii may establish separate accounts within the special fund for major program activities.

(e) All expenditures from the special fund shall be subject to legislative appropriation.

(f) For the purposes of this section, "Mauna Kea lands" shall mean the same as defined in section 304A-A."

SECTION 4. In codifying the new sections added by sections 2 and 3 of this Act, the revisor of statutes shall substitute appropriate section numbers for the letters used in designating the new sections in this Act.

SECTION 5. New statutory material is underscored.

SECTION 6. This Act shall take effect on July 1, 2009.

APPROVED this 18 day of JUN , 2009

GOVERNOR OF THE STATE OF HAWAII

Appendix C. Public Access Plan Participant Input

List of Participants

Notes from Mauna Kea Public Access Plan Roundtables

List of Participants

The following individuals participated in the PAP planning process in a variety of formal and informal ways.

Name		Organization
Andy	Adamson	Joint Astronomy Centre
Pua	Aiu	SHPD, DLNR
Alan	Akau	DOCARE, DLNR
Bruce	Aplin	Haleakalā National Park
Doug	Arnott	Arnott's Lodge & Hiking Adventures
Colin	Aspin	Institute for Astronomy
Kālepa	Babayan	Kahu Kū Mauna
Kenyan	Beals	Former Mauna Kea Ranger
Lars	Bergknut	NASA Infrared Telescope Facility
Steve	Bergfeld	DOFAW, DLNR
Pat	Bergin	Waimea Resident, MKMB
Billy	Bergin, DVM	Paniolo Preservation Society
Richard	Berner	VIS, Former Mauna Kea Ranger
David	Byrne	VIS
Mario	Calderara	Gemini
Richard	Chamberlin	Cal Tech
Clement	Chang	Nā Ala Hele, DLNR
Rob	Christensen	Smithsonian
Matt	Church	Former Mauna Kea Ranger
Paul	Coleman	UH Astronomer
Paul	Conry	DOFAW, DLNR
Dolores	Coulson	Gemini
Vernon	DeMattos	Joint Astronomy Centre
Theresa	Donham	SHPD, DLNR
Stephanie	Donoho	Hawai'i County Research & Development
Jimmy	Enocencio	OHA/ Kalalau Ranch and Victory Gardens
Hanalei	Fergerstrom	Temple of Lono/ Native Hawaiian Practitioner
Dale	Fergerstrom	Kamehameha Schools
Kalani	Flores	Native Hawaiian Practitioner and Cultural Educator
Shane	Fox	Mauna Kea Ranger
Betsy	Gagné	NAR, DLNR
Kūpono	Glenn	Snow Boarder
Richard	Ha	Hāmākua Springs

Name		Organization
Lisa	Hadway	NAR, DLNR/ MKMB Environment Committee
Saeko	Hayashi	Subaru
Arthur	Hoke	Kahu Kū Mauna
Roger	Imoto	DOFAW, DLNR
Patrick	Kahawaiola'a	Keaukaha Homesteaders Association
Tiffnie	Kakalia	Kahu Kū Mauna
Ahi'ena	Kanahele	Mauna Kea Ranger
Marshall	Kanehailua	Hawai'i County Police Department
Maryann	Karraker	Haleakalā National Park
James	Kauahikaua	Hawaiian Volcano Observatory/ MKMB Environment Committee
Eric	Kawamoto	DOCARE, DLNR
Irving	Kawashima	Nā Ala Hele, DLNR
Ku'ulei	Keākealani	Native Hawaiian Practitioner and Cultural Educator
Bill	Kikuchi	Former Aide to Senator Inouye
Larry	Kimura	Kahu Kū Mauna
Ka'iu	Kimura	'Imiloa Astronomy Center
Kyle	Kinoshita	Keck
Ron	Koehler	MKSS
Julie	Leialoha	OHA Forest Management, MKMB Environment Committee
Sam	Lemmo	OCCL, DLNR
Djon	Lim, MD, FACP	High Elevation Medicine
Bob	Lindsey	OHA
Kawika	Lovell	RCUH
Talmadge	Magno	Hawai'i Volcanoes National Park
Toni	Mallow	Kahu Kū Mauna
Bob	Masuda	UH Special Assistant
Rich	Matsuda	Keck
Caroline	Maxwell	VIS
John	McBryde	Snow Use/ Formerly with MKSS
Pat	McCoy	Pacific Consulting Services, Inc.
Ruby	McDonald	OHA
Nancy	McMahon	SHPD, DLNR
Callie	McNew	VIS Staff
Robert	Misajon	PTA Operations, Nā Ala Hele Advisory Council
Kamuela	Moraez	Snow Boarder
Stephanie	Nagata	OMKM
Ronald	Nahaku`elua	MKSS
Cynthia	Nazara	Kona Hawaiian Civic Club

Name		Organization
Rob	Pacheco	Hawai'i Forest & Trail, Ltd.
Michael	Parris	Hunter
Kimo	Pihana	Former Mauna Kea Ranger/ Native Hawaiian Practitioner
Stewart	Putland	Joint Astronomy Centre
Mike	Robinson	DHHL Land Manager
Skylark	Rossetti	Hawai'i Island Economic Development Board
Moana	Rowland	Nā Ala Hele, DLNR
Derrick	Salmon	Canada-France-Hawaii Telescope
Laura	Schuster	HVNP
Hans	Sin	DOFAW, DLNR
Kihalani	Springer	Kahu Kū Mauna
Judi	Steinman	Hawai'i Island Chamber of Commerce
Ed	Stevens	Kahu Kū Mauna
Branning	Sung	Hunter/ Nā Ala Hele Advisory Council
Ron	Terry	MKMB Environment Committee
Steven	Troute	PTA Community Relations
Ruby	Tzimeas	Kona Hiking Club
Don	Weir	Mauna Kea Ranger
Josh	Williams	VIS
Peter	Young	DHHL - 'Āina Mauna Legacy Program

Notes from Mauna Kea Public Access Plan Roundtables

September 16 & 23, 2009

Topic #1: What is pono behavior?

Question: What does pono behavior in the summit region mean to you?

- Respect for the culture
- Quiet
- Respect for authority of rangers, lawful, no speed, no stack rocks
- Relates to how you grow up – respect the mountain
- Tread lightly, take out what you bring, don't make new trails
- Recognize mountain's uniqueness, treat it as such
- Leave no trace
- Do unto others as you would have them do unto you. Take that same attitude towards the mountain.
- Realize your impacts, limit your sound and visual impacts
- Respect the mountain, people, and their cultural views of the mountain
- Respect biodiversity and sensitivity of the resources
- Not about me, people need to have a consciousness of that
- Respect the host culture
- Respect the rangers. They may need to understand Hawaiian rights. Reciprocal respect. Need to know the laws.
- Mutual respect – the way you drive, the way you interact among all users.
- Be humble
- Health aspects – may not be for everyone. Pono behavior for some may be not to go. There are other ways to access the mountain. This refers to children and people with medical conditions.
- Comply and be aware of laws and regulations
- Be aware of what you bring up there re: invasive species
- Everyone should have fun without being arrogant
- Respectful of the place and people who are disrespectful, nudge them, if need be, using the place as a vehicle for teaching
- Code of conduct – physical tone of voice and mindset
- As if you are in church – behave
- Like church – leave things the way you find them, learn about place before hand, don't move or take anything
- Behave like you are in school
- Do not litter. Behave lawfully
- Treat it like you own it and it's your own prized possession
- Hunter's etiquette as taught in Hunter's Education classes. It is necessary to educate re: the dangers before people go to the mountain
- Understand what is expected by the other users on the mountain, i.e. educate re: cultural issues. Provide assistance when needed. Look out for each other. Observe posted guidelines.

- Locals have been going all the time but they may not be reading signs and don't go into education/visitor center. Need to be more clear on what "respectful" means. How do you get people to observe the rules? Take a test?
- Balance – it's important to go to the summit to restore balance in Self
- "Sense of place" - need to educate people on why this place is so special. Once you know, you can be held accountable and this leads to a code of conduct.
- Responsibility for those who know and have a reverence of place to take responsibility to teach others how to be pono.
- Stay on the trail!
- Leave things as you see it – may have been left by a cultural practitioner
- Supposed to be a place of enjoyment and fulfillment – the rest will follow
- Look at the HP brochure
- Appreciate the values/all aspects of all users

Topic # 2: Management methods

Questions:

1. How do we encourage these "pono" behaviors?

2. One of the recommendations in "The Comprehensive Management Plan" would involve use of an entry gate and requiring everyone to get an orientation before being allowed up the summit road. That is one option. Any thoughts?

3. What might be other ways of promoting respectful/"pono" behaviors?

- Passive – educational enforcement, having a person without a uniform sharing info. in addition to signs and brochures
- Education needs to start before people visit the mountain in places like 'Imiloa and the schools.
- "Active" interpretation program – educational enforcement is preferred. Too heavy handed enforcement will seem intimidating. It is still good to have contractual enforcement.
- No gates except when closed for safety. The mountain is not a compound. Educational outreach – welcome the uniform. Educate kupuna and civic club members to become mentors for young people. Less restriction is better. Instead of listing all of the "no" things you can't do, be positive and emphasize what people CAN DO. Many people should be involved in educational outreach.
- Schools could educate the children beforehand about nature, safety. The challenge is how to reach those who don't stop at the educational center.
- If we misuse it, we can lose it.
- A gate is not about denying access, it is about safety. Baseline acclimation is essential and prior orientation. People should sign in so we know who is on the mountain. Who waives the responsibility for children? We should have waivers. Acclimation should be mandatory.
- There were traditional ways to ensure pono behavior. There should be some form of check in. It is too late if you wait to educate people when they are on the mountain already. It is everyone's responsibility to educate others. When 'Imiloa educates visitors it probably doesn't dissuade them from going to the mountain.
- Ads help. Take advantage of funding for PSAs.
- Many possible methods can be used together. Look at the data. Liability exposure?

- Astronomers don't want to discourage visitation. They want people to be safe. They don't like the idea of a gate but instead education. Increase the ranger program and capacity for visitors. Get hotels and observatories involved in promoting safety.
- The only logical way to manage is by controlled access. Entrance should be free if you have a Hawaii Driver's license, otherwise there will be a fee. Liability is the university's. Protect everyone by making sure you know who is going in and who has come out. Safety is important. Take people to high impact areas. Traffic can be horrendous and the road should be blocked during snow days and the number of cars limited. Pickups loading up with snow would not be allowed if there were a tram system. Most logical way for safety.
- Gate is like a seat belt. Without a gate the situation cannot be mandated.
- NAR is right there. Enforcement is an issue. Keep in mind that people feel it is their right. Ever since Hanauma Bay got controlled, locals don't go there anymore. The mountain is part of public trust lands. It is difficult to differentiate visitors from hunters.
- Coordinate whatever one jurisdiction does with the other jurisdictions. Communicate and cooperate.
- Lands are ceded. Only native Hawaiians have Hawaii State constitutional rights
- Welcome the sun with ho`okupu. Accommodation of all? Concern that people can't go if they are not educated. Humu`ula sheep station was suggested as a place for an educational center where people could be given a card of completion that is valid for one year.
- "Passive" info – pamphlets, signs, video. Gate – can't get educated there because you can't stop too long. Gate helps more with strict rules for safety.
- Large fairly simple interpretive signs. Guidelines – are responded to. There should be lots of positive interaction with rangers. Want absolute minimum of primary enforcement. Observatories don't want to close the "owners" out of their house. Observatories are the "guests." Safety- good to have information available at a staffed information center.
- Most emergencies have occurred because people didn't know. Not opposed to a required class. Concern about a gate – would like it to be 24 hours because hunters get an early start, e.g. 3 AM
- Similar to Waipi'o – signs that include proper conduct. Kiosk – show the card that you have taken a class
- Against a gate – not what Hawaii is. Proactive education, positive signage should be tried first and should be interactive, attractive. Including Hawaiian language. Gate should come later if passive education does not work.
- Don't feel we are at the gate stage yet. Need better signage! Mauna Kea signs are terrible. HP would need major changes for a gate to be used. Would need 3 lanes. It is not at the tipping point yet.
- Hunter Education was very valuable. I would be in favor of education and signage.
- Pono behavior education should begin in the communities before people get up there. Want to be proactive. There may be a need for a gate in the future. Need an information center that is attractive and someone is there to actively inform people. Class would be good. Cultural practitioners could teach what proper behavior is.
- Need to start earlier and not try to jam information into people once they get there. Commercial tour businesses should do a class. 'Imiloa should offer a class and could disseminate information. Tap education systems – schools beginning with elementary all the way through university. Streamline the info. via existing school system. Having a presence at the mountain is also important. Multi-faceted management
- Pono begins at home. Gate communicates attentiveness. Certified and card carrying.
- Use visitor channel! Newspapers. Kawaihae gate did not work well. Mauna Kea is not at the card level yet. Implementation is difficult
- The Kawaihae system doesn't work – it is inconvenient. Cool way is better first.

Topic # 3: Hawaiian Traditional and Customary Rights

Questions:

1. What are your suggestions for accommodating native Hawaiian traditional and customary practices while providing for the safety of cultural practitioners when the summit road is closed to the general public due to unsafe conditions?

2. In the interest of ensuring public safety in this remote area while respecting native Hawaiian traditional and customary practices on the mountain, how can comfortable interactions between cultural practitioners and the rangers be promoted?

- Work with the observatories to identify and create a safe area if visitors are under distress
- Check in is necessary, we need to know who is on the mountain, they can be escorted by a ranger
- Weather can change suddenly after you are already on the mountain. If the road is closed, it is only common sense not to go.
- Accommodation- there are lower pu'u that can provide similar experiences to the summit. Set up an altar that can receive ho`okupu – provide alternatives
- If someone wants to go, they will. If can't drive they can choose to walk instead. Who has the liability?
- When the road is closed it is dangerous. I even disagree with the astronomers going up when the road is closed. No one should go. Agree with accommodations. Elements are welcoming you at the lower elevation.
- Cultural practitioners are not stupid. Having something available at lower elevations in the event of bad weather would be good. Liability is a concern.
- Accommodation is the way to go 99% of time. For the rest of the 1% mitigate hazards somehow. Use radio communication.
- Empower rangers to ask practitioners individually in the event of dangerous conditions: "What can we do to accommodate you?"
- Work with practitioners ahead of time to find out what acceptable accommodations would be.
- Educate rangers and astronomers about Hawaiian cultural practices.
- Practices are not the same depending on how you were taught and where you are from. Don't be argumentative. Allow as long as practice is lawful.
- Practitioners may not want to share information on their practices.
- Astronomers could use more education so they can be sensitive to cultural practices.
- Rangers should come off the mountain and develop rapport with practitioners before they get there.
- Practitioners may not be involved in social groups. It would be best to have Hawaiian rangers. May lessen the chance of conflict. Hawaiian sensitivity
- Don't allow conflicting activities to occur. Manage to avoid.
- Would like to know about cultural practices. It would be good to know whatever is not sacred.
- Rangers have always been accommodating.
- Practitioners can be escorted if safety personnel is available
- At night, rangers could accommodate and escort. When the road is closed due to hazardous conditions no one should be allowed on the mountain. Not aware of any traditional and cultural practices that would need to access the mountain under hazardous conditions.
- Both conditions merit caution and discouragement

- Escorting is good but ranger could be endangered. Escorting practitioners at night may work. Safety – practitioners should not be allowed access if road is closed to all
- Night access should be allowed but escort is not necessary if practitioner is staying close to the road. There is a safety in going with others. In severe weather no one should be allowed and an explanation can be given. The safety of rescuers needs to be considered.

Topic #4: Accommodating Growth

Questions:

1. In light of the current increases in visitation and the likelihood of this trend continuing, should increased visitation be accommodated by providing more restroom facilities, shelters, parking, educational programs, or discouraged by not providing such comforts and programs?
2. What should managers look for to monitor the impacts of public activities on the mountain?

- Do we want it like a tourist attraction? We want it to stay quiet. Even though it is difficult don't build more facilities
- Shuttle service would be okay. Limit vehicles to limit erosion. Make accommodations for practitioners. Restrooms should be provided but not obvious or visible.
- Visitor center is already too small. If you don't improve things it is embarrassing. Improve visitor center.
- Changes will be inevitable. When? Tipping point has not been reached yet. We will need to be proactive.
- People are coming anyway even if facilities are inadequate now. It will cause problems if we don't provide adequate facilities.
- Need to create alternatives. 'Imiloa should provide an alternative and duplicate the experience.
- If added infrastructure will mitigate problems, we need to build them.
- Visitor center is lacking. The road is a limiting factor. Provide an alternative. Crash barriers are needed on the road.
- Provide a transport system, improve the visitor center capacity. When do you start saying no?
- People are still coming even without comforts. Don't make it too comfortable
- We can bring science and culture together. Need to foster understanding, not only of the Hawaiian culture.

Signs of impact to be watched:

- Trash and erosion
- Cultural site baselines – monitor changes
- Trash, erosion, misbehavior
- Erosion – especially from vehicles
- Increased traffic – is behavior actually worsening?
- Impact on cultural resources, e.g. people moving them. Need baseline data
- Actively monitor and utilize the help of students. Need to ask higher institutions of learning to help with research
- Driving off road. Mimicking cultural behavior. Respect what is already there.

- # of people who are off road on foot needs to be monitored. The higher the number, the greater the impact.
- Need to determine what the carrying capacity of the mountain is
- Impacts that are positive should also be monitored as a result of educational efforts. Educational efforts that are having a positive impact should be supported.

Appendix D. Correspondence from KAHEA

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KAHEA

THE HAWAIIAN-ENVIRONMENTAL ALLIANCE

PROTECTING

NATIVE HAWAIIAN

CUSTOMARY &

TRADITIONAL RIGHTS

AND OUR FRAGILE

ENVIRONMENT

Office
1149 Bethel Street, Ste. 415
Honolulu, HI 96813

Mailing Address
P.O. Box 37368
Honolulu, HI 96837

toll-free phone/fax
888.528.6288

www.KAHEA.org
kahea-alliance@hawaii.rr.com

KAHEA: the Hawaiian-Environmental Alliance is a non-profit 501(c)3 working to protect the unique natural and cultural resources of the Hawaiian islands. KAHEA translates to English as "the call."

Mr. Jeff Melrose
s. Deborah Chang
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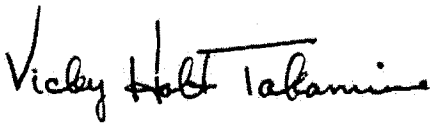

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Appendix E. General Lease

Lease Terms and Conditions

The master lease (General Lease S-4191, dated June 21, 1968) between DLNR (Lessor) and the University of Hawai'i (Lessee) expires on December 31, 2033. The master lease may be terminated at any time by the Lessee or for cause by the Lessor. DLNR's reserved rights include water, trails and access, hunting and recreation, and use of the land. The Lessee agrees to: maintain the premises in a clean and orderly condition; prevent waste or improper or unlawful use of premises; use the lands as a scientific complex, and as a scientific reserve to prevent intrusion of activities inimical to the scientific complex; not discriminate against anyone based on race, creed, color or national origin for those using and enjoying the premises; and observe and comply with all applicable laws, rules, ordinances, and regulations. The lease allows for the construction of improvements (buildings, infrastructure and other improvements), with BLNR's approval. The Lessee also agrees to protect the cultural and natural resources by not damaging or destroying any object of antiquity, prehistoric ruin or monument of historical value and by securing the approval from BLNR before planting vegetation in order to prevent the introduction of undesirable plant species into the area.

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GENERAL LEASE NO. S-4191

THIS INDENTURE OF LEASE, made this 21st day of June, 1968, by and between the STATE OF HAWAII, by its Board of Land and Natural Resources, pursuant to the provisions of Section 103A-90(b), Revised Laws of Hawaii 1955, as amended, hereinafter referred to as the "LESSOR", and the UNIVERSITY OF HAWAII, a body corporate, whose post office address is 2444 Dole Street, Honolulu, City and County of Honolulu, State of Hawaii, hereinafter referred to as the "LESSEE",

WITNESSETH THAT:

FOR and in consideration of the mutual promises and agreements contained herein, the Lessor does hereby demise and lease unto the said Lessee and the said Lessee does hereby rent and lease from the Lessor, all of that certain parcel of land situate at Kaohe, Hamakua, County and Island of Hawaii, State of Hawaii, and more particularly described in Exhibit "A", hereto attached and made a part hereof.

TO HAVE AND TO HOLD, all and singular the said premises, herein mentioned and described, unto the said Lessee, for and during the term of sixty-five (65) years, to commence from the 1st day of January, 1968, and to terminate on the 31st day of December, 2033.

RESERVING UNTO THE LESSOR THE FOLLOWING:

1. Water Rights. All surface and ground waters appurtenant to the demised premises, together with the right to enter and to capture, divert or impound water; provided, that the Lessor shall exercise such rights in such manner as not to interfere unreasonably with the Lessee's use of the demised premises; provided, further, that the Lessee shall have the right to use the waters of Lake Waiau for any purpose necessary or incidental to the use permitted by this lease on the following conditions:

a. No drilling or disturbance of Lake Waiau's bottom, banks or areas adjacent thereto shall be permitted;

b. No activity shall be permitted which will result in the pollution of the waters of Lake Waiau;

c. Lessee shall not take or divert any of the waters arising from springs which furnish the water supply for Pohakuloa; and no alterations to said springs shall be made by Lessee.

2. Access. All rights to cross the demised premises for inspection or for any government purposes.

3. Hunting and Recreation Rights. All hunting and recreation rights on the demised lands, to be implemented pursuant to rules and regulations issued by said Board in discharging its fish and game or state parks responsibilities; provided, however, that such hunting and recreation activities shall be coordinated with the activities of the Lessee on the demised lands; and provided, further, that such hunting and recreation activities shall be limited to day-light hours only.

4. Right to use Demised Lands. The right for itself, and its successors, lessees, grantees and permittees, to use any portion of the lands demised and the right to grant to others rights and privileges affecting said land; provided, however, that, except as otherwise provided herein, no such use shall be permitted or rights and privileges granted affecting said lands, except upon mutual determination by the parties hereto that such use or grant will not unreasonably interfere with the Lessee's use of the demised premises; provided, further, that such agreement shall not be arbitrarily or capriciously withheld.

THE LESSEE, IN CONSIDERATION OF THE PREMISES, COVENANTS WITH THE LESSOR AS FOLLOWS:

1. Surrender. The Lessee shall, at the expiration or sooner termination of this lease, peaceably and quietly surrender and deliver possession of the demised premises to the Lessor in good order and condition, reasonable wear and tear excepted.

2. Maintenance of the Premises. The Lessee shall keep the demised premises and improvements in a clean, sanitary and orderly condition.

3. Waste. The Lessee shall not make, permit or suffer, any waste, strip, spoil, nuisance or unlawful, improper or offensive use of the demised premises.

4. Specified Use. The land hereby leased shall be used by the Lessee as a scientific complex, including without limitation thereof an observatory, and as a scientific reserve being more specifically a buffer zone to prevent the intrusion of activities inimical to said scientific complex.

Activities inimical to said scientific complex shall include light and dust interference to observatory operation

~~during hours of darkness~~ and certain types of electric or electronic installation on the demised lands, but shall not necessarily be limited to the foregoing.

5. Assignments. The Lessee shall not sublease, sub-rent, assign or transfer this lease or any rights thereunder without the prior written approval of the Board of Land and Natural Resources.

6. Improvements. The Lessee shall have the right during the existence of this lease to construct and erect buildings, structures and other improvements upon the demised premises; provided, that plans for construction and plot plans of improvements shall be submitted to the Chairman of the Board of Land and Natural Resources for review and approval prior to commencement of construction. The improvements shall be and remain the property of the Lessee, and shall be removed or disposed of by the Lessee at the expiration or sooner termination of this lease; provided, that with the approval of the Chairman such improvements may be abandoned in place. The Lessee shall, during the term of this lease, properly maintain, repair and keep all improvements in good condition.

7. Termination by the Lessee. The Lessee may terminate this lease at any time by giving thirty (30) days' notice in writing to the Lessor.

8. Termination by the Lessor. In the event that (1) the Lessee fails to comply with any of the terms and conditions of this lease, or (2) the lessee abandons or fails to use the demised lands for the use specified under paragraph 4 of these covenants for a period of two years, the Lessor may terminate this lease by giving six months' notice in writing to the Lessee.

9. Non-Discrimination. The Lessee covenants that the use and enjoyment of the premises shall not be in support of any

policy which discriminates against anyone based upon race, creed, color or national origin.

10. General Liability. The Lessee shall at all times, with respect to the demised premises, use due care for safety, and the Lessee shall be liable for any loss, liability, claim or demand for property damage, personal injury or death arising out of any injury, death or damage on the demised premises caused by or resulting from any negligent activities, operations or omissions of the Lessee on or in connection with the demised premises, subject to the laws of the State of Hawaii governing such liability.

11. Laws, Rules and Regulations, etc. The Lessee shall observe and comply with Regulation 4 of the Department of Land and Natural Resources and with all other laws, ordinances, rules and regulations of the federal, state, municipal or county governments affecting the demised lands or improvements.

12. Objects of Antiquity. The Lessee shall not appropriate, damage, remove, excavate, disfigure, deface or destroy any object of antiquity, prehistoric ruin or monument of historical value.

13. Undesirable Plants. In order to prevent the introduction of undesirable plant species in the area, the Lessee shall not plant any trees, shrubs, flowers or other plants in the leased area except those approved for such planting by the Chairman.

IN WITNESS WHEREOF, the STATE OF HAWAII, by its Board of Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and these presents to be duly executed this 21st

day of June, 1968, and the UNIVERSITY OF HAWAII, by its Acting President and VP for Business Affairs has caused these presents to be duly executed this 17th day of June, 1968, effective as of the day and year first above written.

STATE OF HAWAII

By: _____
ACTING Chairman and Member
Board of Land and
Natural Resources

And By: _____
Member
Board of Land and
Natural Resources

UNIVERSITY OF HAWAII

By: _____
Its ACTING President

And By: _____
Its

APPROVED AS TO FORM:

_____
Deputy Attorney General
Dated: 5-8-68

mm
Proofed by:

EXHIBIT "A"

MAUNA KEA SCIENCE RESERVE

Kaohe, Hamakua, Island of Hawaii, Hawaii

Being a portion of the Government Land of Kaohe

Beginning at a point on the south boundary of this parcel of land, the coordinates of said point of beginning referred to Government Survey Triangulation Station "SUMMIT 1955" being 12,325.95 feet South and 471.84 feet West, as shown on Government Survey Registered Map 2789, thence running by azimuths measured clockwise from True South:-

1. Along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 135° 00' 18,667.62 feet;

2. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, still on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 225° 00' 18,667.62 feet;

3. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, still on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 281° 18' 04.6" 5173.56 feet;

4. 207° 49' 06.5" 841.83 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;

5. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 1200.00 feet, the chord azimuth and distance being: 297° 49' 06.5" 2400.00 feet;

6. 27° 49' 06.5" 841.83 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;

7. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 306° 59' 47.4" 1824.16 feet;

8. 227° 29' 00.9" 2805.06 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;

9. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 1500.00 feet, the chord azimuth and distance being: 317° 29' 00.9" 3000.00 feet;

10. 47° 29' 00.9" 2805.06 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;

11. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13200.00 feet, the chord azimuth and distance being: 325° 31' 55.2" 701.87 feet;

12. 245° 46' 12.7" 2760.45 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;

13. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 2000.00 feet, the chord azimuth and distance being: 335° 46' 12.7" 4000.00 feet;

14. 65° 46' 12.7" 2760.45 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;

15. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 352° 14' 32.9" 3563.50 feet;

16. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, still on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 45' 00' 18,667.62 feet to the point of beginning and containing an AREA OF 13,321.054 ACRES.

EXCEPTING and RESERVING to the State of Hawaii and to all others entitled thereto, the Mauna Kea-Humuula and Mauna Kea-Umikoa Trails, and all other existing trails within the above-described parcel of land, together with rights of access over and across said trails.

ALSO, EXCEPTING and RESERVING to the State of Hawaii, its successors and assigns, the waters and all riparian and other rights in and to all the streams within the above-described parcel of land.

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Appendix F. DLNR Policy for Commercial Activities on State Owned and Managed Lands and Waters

Policy for Commercial Activities on State Owned and Managed Lands and Waters Department of Land and Natural Resources

RECOMMENDATIONS APPROVED ON 1/30/98:

1) The Board accepted the final report of *Findings and Recommendations* from the Department's Commercial Use Task Force, and acknowledged the fine work of the Task Force in establishing the basis for the Department's commercial use policies.

2) The Board adopted the following commercial activity policies and directed the Department to develop appropriate standards and processing mechanisms to implement these policies as needed with the following caveats:

- This should be done in a timely but transparent manner to assure that all affected constituencies are aware and participate where appropriate;
- It should not unreasonably affect outstanding permits, licenses, and existing memoranda of understanding;
- The diversity of resources managed by the Department will require different implementation approaches;
- The current funding constraints will delay some actions needed for full implementation of these policies; and
- All relevant commercial activity proposals brought forward for Board approval will have considered these commercial activity policies.

POLICY # 1:

The Department, when considering commercial activity proposals or management actions on state owned lands and waters, will use the following hierarchy of priorities:

a. The Natural or Cultural Resource - The highest priority should go to the conservation of the resource. Only if an activity can be done in a way that does not **unduly damage** the resource, should it be allowed.

b. The General Public - If use or activity by the public can be done without undue damage to the resource, it should be the next priority.

c. *Commercial Activities* - Commercial activities should be considered only if their impacts do not impinge on the resource, #a above, or use by the general public, #b, above.

If public and commercial activities are occurring, and resource impacts indicate that restrictions or controls need to be imposed, these should first be levied on commercial operators. The general public is the last group to have restrictions and controls imposed on them.

POLICY # 2:

The principles of ***Limits of Acceptable Change*** should be used to monitor and manage intensities of use.

POLICY # 3:

Any new permits for commercial activity should have explicit conditions to allow DLNR ability to change levels or terminate certain activities based upon stated limits of acceptable change. This will insure that managing agencies have timely opportunities to remedy any problems that occur as a result of that permit.

POLICY #4:

The ***Managing Agency*** has the lead responsibility to coordinate an applicant's activity application. The Managing Agency is responsible to inform other appropriate agencies and solicit comments much in the way present CDUA applications are handled by the Lands Division. Any environmental documentation (e.g. environmental impact statements and/or assessments) needed to process any commercial activity will be the responsibility of the applicant.

POLICY #5:

The ***Managing Agency*** can issue activity permits for routine activities and not for profit organizations without Board approval. Memoranda of understanding can be established for not for profit organizations to cover a range of activities. Very significant activities and/or those requesting multiple years should go to the Board for approval.

POLICY #6:

Reasonable fees for commercial users should be assessed based either on a percentage of gross revenues, per user, or expected impacts of their activity. While any group conducting an activity should be encouraged to also perform work that improves the

resource, or mitigates their presence, there should be no guaranteed waiver of all fees for service of this kind. Not for profit groups that charge fees only to cover administrative costs can be exempted from fees.

POLICY #7:

The Department will compile a list of eligible sites for commercial activity. The list will also note the intensity of commercial activity that will be permitted. The list will be periodically reviewed and updated.

Definitions:

Activity - A pursuit that does not involve the changing or alteration of land or water areas, or existing structures on those land or water areas. In general, activities are those things that take place on the resources in a passive way , do not involve any resource extraction, or do not require the imposition of change on the resource.

Commercial Activity - The collection by a party or their agent of any fee, charge, or other compensation shall make the activity commercial except when such fee, charge, or other compensation is for the sale of literature allowed under Chapter 13-7-7, HAR. . Nonprofit status of any group or organization under Internal Revenue or Postal Laws or regulations does not in itself determine whether an event or activity arranged or managed by such a group or organization is noncommercial. Not for profit groups that charge only a nominal fee for administrative costs that utilize a public facility or resource at a frequency and/or magnitude that does not significantly contribute to the degradation of the facility and/or resource will be considered non-commercial.

Ecotourism - Travel to Hawaii's natural, cultural, and historic attractions to experience and study Hawaii's unique environment, heritage and culture in a manner which is ecologically responsible and sustainable, and sustains the well-being of local communities.

Group - A collection of people that assemble for the same purpose or event.

Limits of Acceptable Change - A concept of assessing impacts to the resource. Under this concept, descriptors are established indicating what level of change or impact is tolerable, or what level it takes to trigger some kind of remedial action. If a resource is unduly impacted, restrictions are imposed, regardless of the number of users.

Managing Agency - The Managing Agency is that lead Division or office that has jurisdictional responsibility for the area being considered for an activity. If a proposed activity takes place on more than one jurisdiction, the division or office having the greatest area of resource will be considered as the Managing Agency.

Undue Damage or Impact - Includes excessive damage, or those impacts which cannot be economically remedied, given a managing agency's resources.

Use - If a proposed action will involve a change or construction, this is considered a use.