



*E ala ē me ke aloha a me ka ‘oia‘i‘o.*  
*Awaken with aloha and truth.*

**FR: E. Kalani Flores, Flores-Case ‘Ohana**

**RE: Written Comments for BLNR Agenda Item K-2 (July 22, 2022) - Mauna Kea Comprehensive Management Plan Supplement**

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## RECOMMENDED BOARD ACTIONS

**We urge the State Board of Land and Natural Resources (BLNR) to take the following actions regarding agenda item K-2 pertaining to the *Mauna Kea Comprehensive Management Plan 2022 Supplement: Management Actions Update* (Supplement):**

- 1) DEFER action on this proposed Supplement until comments and recommendations from this and other testimonies can be adequately addressed and not just systematically dismissed. Otherwise, approving this deficient plan as presented would be another example of just ‘rubber-stamping’ items without providing due diligence in these matters.**
- 2) INSTRUCT the UH to recognize that Native Hawaiian stakeholders as stipulated in the CMP to be consulted in a meaningful fashion and the same timely manner as other stakeholders as it pertains to existing and proposed new policies/plans associated with Mauna Kea.**
- 3) INCORPORATE necessary revisions to this Supplement based upon recommendations shared in this and other testimonies and comments as part of a “comprehensive review” by BLNR members.**
- 4) ESTABLISH procedures for members of the public to inform BLNR/DLNR when UH is not in compliance with the CMP and other conservation district rules.**

## SUMMARY OF COMMENTS

**The BLNR, Department of Land and Natural Resources (DLNR), and University of Hawai‘i (UH) have the affirmative duty and legal obligations to protect the natural and cultural resources, public land trust, and rights of the public and Kanaka Maoli (aka Native Hawaiians) connected with Mauna a Wākea (also referred to as Mauna Kea).**

The goal of the Mauna Kea Comprehensive Management Plan (CMP) was to provide the UH along with the former Office of Mauna Kea Management (OMKM) and now the Center of Maunakea Stewardship (CMS) with management actions to effectively and efficiently manage the uses and activities on Mauna Kea in a way that will preserve and protect its cultural and natural resources. Even with the CMP being approved by BLNR in 2009 along with subsequently approved sub-plans, why has the UH continued to impose substantial, significant, and adverse impacts upon the natural and cultural resources of Mauna Kea? And why has the BLNR/DLNR’s oversight been non-existent and significant aspects of UH’s mismanagement been allowed to continue?

**It’s very evident that UH’s role to advance astronomy on Mauna Kea, conflicts with its ability to properly manage these environmentally and culturally sensitive resources of a**

**public lands trust, also considered government lands of the Kingdom of Hawai‘i. The existing process has been politically driven to push through astronomical development on Mauna Kea by systematically ignoring community and Kanaka Maoli concerns for several decades and thus resulting in the overdevelopment of this conservation district. As it has been previously noted, there has been a failure to timely implement actions of the CMP.**

BLNR/DLNR, representing the State as the Lessor, has the sole legal obligation, duty, and responsibility to appropriately manage and protect these conservation and public lands of Mauna Kea. BLNR/DLNR has improperly delegated those duties and responsibilities resulting in non-compliance with the BLNR and UH Board of Regents (BOR) approved plans for Mauna Kea. The failure of BLNR/DLNR to assume their appropriate role as Lessor has resulted in substantial, adverse, and significant impacts to the natural, cultural, and historic resources on Mauna Kea. This matter has been previously brought to the attention of the BLNR/DLNR for several decades as noted below in the Hawaii State Auditor’s Report No. 05-13 (p. 30):

The lack of oversight by the department allows the university and its sublessees unchecked discretion on the use of Mauna Kea and leaves cultural and natural resources at risk for further damage.

**BLNR/DLNR is called upon to reverse a long history and pattern of not following their own rules set forth for the management of conservation lands and to enforce UH’s compliance with the CMP, sub-plans, and other master plans for Mauna Kea.**

## **SPECIFIC COMMENTS**

### **I. CMP Supplement is deficient, incomplete, & missing significant information**

**UH has presented the proposed Supplement in a deficient and incomplete manner that is also missing several significant narratives from the 2009 CMP.** This Supplement has been done in a very convoluted manner that would make it more difficult to properly implement the CMP in the future. Also, significant narratives have been purged from the CMP. In addition, the Supplement has failed to reference the applicability of the BLNR-approved CMP sub-plans (Cultural Resources Management Plan, Natural Resources Management Plan, Public Access Plan, & Decommissioning Plan) and how the proposed changes would be integrated into these sub-plans when moving forward with the CMP’s implementation. Likewise, the Supplement has failed to provide necessary general updates to the CMP and sub-plans. Similarly, the Supplement lacks any discussion of OMKM’s document entitled, *Implementing and Evaluating*

*the Comprehensive Management Plan for UH Managed Lands on Mauna Kea* (Implementation and Evaluation Plan).

**Recommendations:**

1) The specific proposed changes should be included in the Appendices instead of embedded within the narratives of the Supplement so that for future implementation these specific changes can be easily referenced. For example, the section in 1.2 (UPDATE TO LOCATION AND DESCRIPTION OF UH MANAGEMENT AREAS) of the Supplement should be extracted and included in the Appendices and identified as Section 3.1.1 similar to the 2009 CMP. Then section 1.2 of the Supplement could just include a narrative explaining the reasoning for the change. Likewise, relevant sections and tables of chapters 3-14 of the Supplement should be renumbered and blended with some of the existing narratives in the 2009 CMP and then included in the appendices as Section 7.

2) Certain relevant and significant narratives of the 2009 CMP should be retained in the Supplement instead of purging this information. For example, Chapter 3 (Cultural Landscape) has excluded a consequential amount of information and substantiating narratives. Also, detailed descriptions, background information and additional considerations of management actions were eliminated and should be retained in the updated Supplement. Compare *Section 7.1 Understanding and Protecting Mauna Kea's Cultural and Natural Resources* of the CMP with Chapters 3 and 4 of the Supplement.

3) There is no practical explanation of why the original heading of “Native Hawaiian Cultural Resources” was changed in Chapter 3 to “Cultural Landscape.” This is another attempt by the UH to diminish Native Hawaiian connections to Mauna Kea. If a change is made, it should be changed to “**Cultural Resources**” which is the term used at both the federal and state levels in reference to the protection and management of such resources especially as it pertains to definitions provided by the Advisory Council on Historic Preservation and the Council of Environmental Quality in relation to several federal laws and executive orders. Also, the reference to “Landscape” isn’t as inclusive to all cultural resources such as archaeological collections that UH has implied. In addition, the use of the term “Cultural Landscape” would require a complete overhaul and update to other aspects of the CMP including the sub-plan, Cultural Resources Management Plan.

4) Other specific recommendations to improve this deficient and incomplete Supplement are included in **Appendix A - Specific Recommendations** of this submittal.

## II. UH failed to adequately and timely consult with Native Hawaiian stakeholders in the review process

**UH failed to conduct a meaningful community engagement process and lacked adequate and timely consultation with Native Hawaiian stakeholders.** The CMP clearly outlined a community engagement and consultation process that also identified stakeholders who have cultural, legal, or political affiliation with Mauna Kea. See *4. Community Engagement Process (2009 CMP, pp. 4-1 - 4-7)* However, UH has continued a pattern of excluding the following CMP-identified Native Hawaiian stakeholders from the initial engagement, consultation, and review process.

- **Families** with lineal or historic relationship to Mauna Kea either through their genealogy, burials, or children's piko.
- **Hawaiian Cultural Practitioners** include those who access the UH Management Areas for religious and spiritual purposes and/or cultural ceremonies for the observance of events.
- **Hunters and Resource Gatherers** are individuals, families, and organizations that access the UH Management Areas to hunt and gather materials for cultural and subsistence purposes.

On the other hand, others such as those of the UH System, astronomy organizations, government agencies, commercial tour operators, etc. were initially engaged and given the opportunity to review and comment on the *Draft Outcome Analysis Report (OAR)* as noted below and in *Table B-1: Stakeholder Outreach for Draft OAR*. (emphasis underlined)

In accordance with the provisions of the CMP, CMS, which has replaced the Office of Mauna Kea Management (OMKM) as the entity responsible for overseeing the UH Maunakea Lands, prepared a Draft Outcome Analysis Report (Center for Maunakea Stewardship, April 2021) describing the progress that UH had made in implementing the management actions contained in the CMP and outlining the adaptations, adjustments, and changes that it believed should be made to those measures in the coming years. It circulated the draft OAR to agencies and advisors participating in the review process at the end of April 2021, and followed up over the following weeks with video-conference meetings with those agencies and advisors. It then used the written and oral feedback that it received to revise and finalize the OAR. (1.4.3 THE CMP MANAGEMENT ACTIONS UPDATE/SUPPLEMENT PROCESS, CMP Supplement, p. 1-6)

**It's very apparent that Native Hawaiian stakeholders were excluded from this review process.** Failing to engage Native Hawaiian stakeholders in this process contradicts the CMP guidelines and management actions as noted below. (emphasis underlined)

It is recommended that OMKM continue to consult with Native Hawaiian organizations and individuals on existing policies and proposed new policies. (CRMP, pp. 5-9 to 5-10)

Likewise, when it came to the review process of this Supplement as well as other UH plans such as the new *Master Plan for the University of Hawai'i Maunakea Lands*. Native Hawaiian stakeholders were **not** engaged early in this consultation process even though others were provided an opportunity to review and comment on a pre-draft over a year in advance. Instead, Native Hawaiian stakeholders, including ourselves, were only contacted by email on October 14, 2021 when comments were due on October 26th. This extremely late attempt at contact is perceived more as an afterthought or as a formality to state that consultation was attempted. There are no excuses why we and other cultural practitioners were **not** contacted earlier when the UH System, governmental agencies, elected officials, astronomy organizations, commercial tour operators, etc. were given the opportunity to review earlier pre-draft versions of this plan.<sup>1</sup> In addition, even when relevant and significant comments were submitted, they were systematically ignored. Firstly, the voice of the Mauna Kea observatories was clearly the overriding voice throughout this draft plan. Whereas, the voices of Native Hawaiian cultural practitioners were excluded during the initial process of drafting this plan as well as with the final version. Nearly 1,500 individuals submitted comments to the CMS by October 26, 2021. Likewise, the Flores-Case 'Ohana engaged in this process and provided written comments via email and also provided comments during a video conferencing meeting. However, the revisions made to the draft master plan were primarily "*minor copyediting changes*" without any substantial changes when the final version was presented to the BOR for their approval. Conclusively, the communication between the UH and Native Hawaiian stakeholders and community members was not timely and quite pathetic. Case in point, when this matter was brought forth for a special BOR meeting on December 16, 2021, CMS only sent us an email regarding this meeting the day before on December 15th.

**Why does the UH ask the public for input and comments/feedback, but is not going to apply any constructive critique and relevant recommendations to their policies/plans? This matter of the UH not implementing a meaningful community engagement process and lacking adequate and timely consultation with Native Hawaiian stakeholders has been**

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<sup>1</sup> See: Appendix A - Summary of Outreach and Consultation

**brought to the attention of UH for decades. These are examples of the systematic pattern of the UH not listening to Native Hawaiian stakeholders and community members regarding the proper management of the natural and cultural resources of Mauna Kea.**

This issue was noted in the CMP as well as in the recent *Independent Evaluation of the Implementation of the Mauna Kea Comprehensive Management Plan (Independent Evaluation)* prepared for DLNR in 2020 as follows (emphasis underlined):

Second, members of the Native Hawaiian community, both those who oppose and support UH’s management of Mauna Kea, were not consulted on matters related to cultural and resources issues. The CMP specifically identifies the Native Hawaiian stakeholders to include families with cultural and lineal connections to Mauna Kea, Kūpuna, cultural practitioners, the Office of Hawaiian Affairs and other Native Hawaiian groups. Representatives from these stakeholder groups have consistently commented that they were not consulted by OMKM on cultural issues, including removal of family shrines, stacking of Pōhaku, and identification of cultural sites.

Third, OMKM did not effectively engage with the community, in particular, members of the Native Hawaiian community, on education and outreach efforts, including decision-making process related to the management of Mauna Kea. Many Native Hawaiians on Hawaii Island feel disengaged and disrespected by OMKM. In particular, there is an absence of genuine consultation with the Native Hawaiian community that has resulted in greater mistrust of UH. Even with the Native Hawaiian constituency who strongly support OMKM and telescope development, OMKM has not taken the opportunity to involve them in their community outreach efforts. (*Independent Evaluation*, p. iii)

### **III. State governing boards have adopted a procedure of not listening during the public review process**

**Based upon our personal experience of being engaged in the public review process, public hearings appear to be just a formality as the decisions regarding the approval of permits or plans. Despite community members participating in board meetings and hearings and providing relevant testimony, such comments are systematically dismissed or ignored.**

**How can the appearance of impropriety be removed from this public review process?**

**Firstly, BLNR members should actually listen to public comments and read testimonies in their entirety and incorporate appropriate actions into decision making instead of just ‘rubber-stamping’ approvals.**

#### **IV. BLNR/DLNR have failed to ensure that UH is in compliance with its Mauna Kea management plans**

**Before BLNR approves permits or any other actions within the Mauna Kea Science Reserve (MKSr), the UH must be in compliance with the BLNR approved management plans and conditions of the Conservation District rules. Furthermore, BLNR/DLNR have the statutory obligation to ensure that UH is in compliance with these plans. Likewise, the BLNR is required to complete a “comprehensive review” prior to approving permits and associated management plans under HAR § 13-5-30.**

Highlighted below are examples of the UH’s non-compliance with the Mauna Kea CMP, associated sub-plans, and master plans.

**1. Firstly, UH’s non-compliance with the CMP management actions that are identified as “*CMP Monitoring, Evaluating and Updating*” is very evident as noted below:**

**MEU-1:** UH has failed to inform the public of “results of management activities in a timely manner.”

**MEU-2:** UH has failed to regularly review and update the CMP and sub-plans that were required in order to be in compliance with the rules of the Conservation District. The CMP was submitted to and approved by the BLNR on April 9, 2009. In addition, it’s been over a decade and UH failed to complete the five-year major review of this plan in a timely manner that was due April 2014 as stipulated in the CMP. Section 7.4.2 of the CMP outlines the requirements and process for monitoring, evaluating, and updating this plan as noted below. (emphasis underlined)

Regular monitoring and evaluation of the CMP is needed to determine if management actions are effective over time and are meeting management needs, and to ensure that the best possible protection is afforded Mauna Kea’s resources.

Monitoring and evaluation of the effectiveness of the CMP should occur annually, and an annual progress report should be prepared. A major review and revision of the CMP should occur every five years, using information contained in the annual reports. Five-year evaluation and revision should include consultation with federal and state agencies and the local community, to inform stakeholders on program progress, and to gather input on changes or additions to management activities. The CMP must also be updated to comply with any requirements or conditions imposed by the BLNR on the CMP upon acceptance of the plan. (CMP at 7-64)

The requirement for UH to conduct a “major review every five years” is further reiterated in the *CMP Implementation and Evaluation Plan* as outlined below:

4.2.2 Five-Year Management Outcome Analysis and CMP Revision The OMKM program should be subjected to a major review every five years, and the CMP should be revised, as necessary. This process should involve input from State and Federal agencies and the public. (CMP IP at 17).

CMP MONITORING, EVALUATION AND UPDATES		
Management		
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.	OMKM
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	OMKM
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.	OMKM

CMP MONITORING, EVALUATION AND UPDATES		
Management		
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.	Immediate
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	Short-term / As needed
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.	As needed

2010 Annual Plan to the BLNR, Status of the Implementation of the Mauna Kea CMP (pp. B-12, C-12)

CMP MONITORING, EVALUATION AND UPDATES			
Management			
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.	Ongoing	Reports are provided at the publicly held Mauna Kea Management Board Meeting. DLNR is represented on the Mauna Kea Management Board. NRMP 4.1.3.3 PAP 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 the resources.	Short-Term	Five-year CMP revision interval is 2014. Revision process initiated by OMKM for eventual submission to BLNR. NRMP 5.2 CRMP 5.5 PAP 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.	In Progress	Updates to the Master lease have been initiated. PAP 7

2015 Annual Plan to the BLNR, Status of the Implementation of the Mauna Kea CMP

MONITORING, EVALUATION AND UPDATES			
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.	Ongoing	Reports are provided at the publicly held MKMB Meetings.
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about the resources.	Ongoing	Five-year CMP revision interval was initiated in 2014. EnVision Maunakea and administrative rules will play a role in the updating the CMP.
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.	Ongoing	UH is preparing an EIS for a new land authorization for UH's lands on Maunakea. A Prep Notice was prepared and published in February 2018. UH is reviewing comments and is considering them in the development of the draft. The 2000 Master Plan is being replaced by a new version, with preparation ongoing. The 2009 CMP is being updated, with preparation of progress report and DLNR review ongoing.

2020 Annual Plan to the BLNR, Status of the Implementation of the Mauna Kea CMP

**Furthermore, BLNR/DLNR have failed to enforce UH's compliance with these significant management actions of the CMP even though these actions were identified in UH/OMKM's Annual Plans that have been submitted to BLNR since 2010.**

**2. UH has failed to implement and complete several significant components of these management action plans that required immediate implementation. The CMP identified specific management actions in order to protect the natural and cultural resources on Mauna Kea.**

OMKM was tasked with directly overseeing and implementing the management actions identified in the CMP Implementation and Evaluation Plan. However, there were several significant management actions that were originally listed in the 2009 timeframe as *Immediate (1-3 years)* and *Short-term (4-6 years)* that have not yet been implemented and accomplished.

**Subsequently, UH changed their reporting methods assigned to the progress status definitions. This resulted in having the existing CMP status reports being submitted annually to BLNR for review without any definitive dates listed for the implementation of these management actions that in many cases are considered crucial in the protection of Mauna Kea’s natural and cultural resources. In addition, the information included in the CMP status reports have been inaccurate or incomplete at times.**

**Furthermore, a thorough review and analysis of these CMP status reports by BLNR/DLNR has basically not occurred to ensure a timely and appropriate implementation of the CMP management actions. Records will clearly demonstrate that DLNR staff never completed any follow-up reports to the BLNR for those CMP status reports submitted between 2010-2017. It wasn’t until January 2018, after the second TMT contested case hearing, that DLNR-OCCL staff actually did a briefing with the Board regarding Mauna Kea. DLNR-OCCL did generate a staff report with general Mauna Kea background information to accompany the CMP status reports for 2018 and 2019. However, these two staff reports failed to articulate any type of review or analysis of these CMP status reports.<sup>2</sup> It’s uncertain what was generated by DLNR-OCCL staff for 2020 and 2021.**

One such example of these incomplete management actions is *FLU-2* in which UH was required to develop “land use zones” in the Astronomy Precinct based on updated cultural and natural resource information that would “*delineate areas where future land use will not be allowed and areas where future land use will be allowed*”. The following description outlines the significance and goal of completing management action **FLU-2 Land use zones**:

Any potential future observatories will be located inside the Astronomy Precinct.  
The goal of this process is to refine telescope siting areas defined in the 2000

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<sup>2</sup> See [OCCL - Maunakea Management](#)

Master Plan based on updated cultural and natural resource information (see Section 7.1.1 and Section 7.1.2). Land use zones will be developed that will delineate areas where future land use will not be allowed and areas where future land use will be allowed, but where compliance with prerequisite studies or analyses prior to approval of a CDUP, will be required. When assessing proposed infrastructure expansion, additional consideration will be given to the location of current infrastructure and previously disturbed areas (see Section 7.3.1). New land uses should be located close to existing infrastructure or previously disturbed areas, to reduce impacts on undisturbed areas and to minimize unnecessary damage to geological features. As stated in the 2000 Master Plan, all major undeveloped cinder cones and their intervening areas will be protected from future development by astronomical or other interests.

These include the following pu‘u: Ala, Hoaka, Kūkahau‘ula, Līlinoe, Māhoe, Mākanaka, Poepoe, Poli‘ahu, and Ula. (CMP at 7-57 to 7-58)

This is a prime example of a management action that was initially identified for “**Immediate**” implementation, but was later changed to “**Ongoing**.” Later in the BLNR 2015 Annual Report submitted by the OMKM, *FLU-2* was still not implemented as required. As noted, “*This was originally listed for Immediate implementation. However, this task will require additional data gathered from baseline surveys of the resources.*” Then in the BLNR 2020 Annual Report, it clearly exhibits that this management action still wasn’t completed. Instead, there’s only a convoluted comment implying that UH doesn’t intend on completing this significant aspect of the CMP.

CONSIDERATION OF FUTURE LAND USE							
Facility Planning Guidelines							
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	As needed					
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	Immediate					

2010 Annual Plan to the BLNR, Status of the Implementation of the Mauna Kea CMP

COMPONENT PLAN: MANAGING THE BUILT ENVIRONMENT				
		Implementation Schedule	Comments	Sub Plans
<b>CONSIDERATION OF FUTURE LAND USE</b>				
<b>Facility Planning Guidelines</b>				
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	Ongoing	The Design Review Process, which incorporated the 2000 Master Plan's design guidelines, are being used in the review of the Thirty Meter Telescope project	NRMP 5.1.1
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	Short-Term	This was originally listed for immediate implementation. However, this task will require additional data gathered from baseline surveys of the resources.	NRMP 4.3.3.1

2015 Annual Plan to the BLNR, Status of the Implementation of the Mauna Kea CMP

COMPONENT PLAN: MANAGING THE BUILT ENVIRONMENT				
		Implementation Status	Comments	
<b>CONSIDERING FUTURE LAND USE</b>				
<b>Facility Planning Guidelines</b>				
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	Ongoing	The Design Review Process, which incorporated the 2000 Master Plan's design guidelines, were used in the review of the Thirty Meter Telescope project	
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	Ongoing	Areas previously mapped as off-limits for future land use through plans such as the Master Plan or CMP are used to limit any proposed activity. UH President Lassner confirmed that TMT was the last telescope to be built on undisturbed land. Resource data must be part of any proposal for major land use requests. HAR 13-5 allows for different types of land uses with each having its own requirements for preparing a land use application. Thus a single pre-prepared map cannot possibly address all potential scenarios.	

2020 Annual Plan to the BLNR, Status of the Implementation of the Mauna Kea CMP

**In order to protect the natural and cultural resources on Mauna Kea, UH should be mandated to implement these incomplete requirements and other significant management actions dating back to 2009 prior to approval of any new CDUPs within this Conservation District. Correspondingly, BLNR/DLNR should assume their prime responsibility to require UH's compliance with these management actions in a timely manner.**

**3. UH has failed to implement and complete the significant CMP/CRMP management action that required regular consultation and engagement with Native Hawaiians to protect their rights and practices associated with Mauna Kea.**

UH has drastically failed to engage and consult with Native Hawaiian stakeholders and the broader Hawaiian community beyond Kahu Kū Mauna and the Hawaiian Culture Committee (which is either inactive or has been terminated). Guidance into this matter is outlined in the CMP and CRMP (p. 5-9 to 5-10) as such (emphasis underlined):

**5.3 ON-GOING CONSULTATION WITH THE KAHU KU MAUNA COUNCIL AND THE HAWAIIAN CULTURE COMMITTEE**

Preservation planning recognizes the need to continue the process of consulting with the major stakeholders. A mechanism for accomplishing this goal with the

astronomy community already exists in the form of regular meetings with OMKM. Periodic reviews of the CRMP would involve all of the stakeholders. In view of all of the unresolved issues pertaining to cultural practices, it is the Native Hawaiian community that needs to be consulted on a frequent basis. Some of this is presently occurring with the Kahu Kū Mauna Council and the Hawaiian Culture Committee, but it will be broadened to include more of the Hawaiian community.

### **Management Actions**

It is recommended that OMKM continue to consult with Native Hawaiian organizations and individuals on existing policies and proposed new policies. Two specific recommendations are presented in Table 5-3.

Table 5.3. Management Actions for On-Going Consultation with Native Hawaiians.

- Develop a mechanism to assure that Kahu Kū Mauna is consulted on individual development projects.
- Provide a list of individuals, families, or organizations who should be consulted when individual development projects are proposed or when other issues arise that may be a concern.

One benefit of compiling a list of organizations and persons that should be consulted is that such a list could accommodate those who are concerned about a particular place or area but do not wish to disclose its location or the nature of its significance. They could appear on the roster as wanting to be consulted about any planned activity or issue occurring in the general vicinity and then decide if they wish to act on any concerns they have.

**According to the second TMT contested case hearing testimony of the OMKM Director, a list of Native Hawaiian individuals, families, organizations and cultural practitioners to be consulted still hadn't been finalized as of December 2016 despite this action item being identified with the CMP priority of High to Medium. What's most troubling is that this management action of compiling a list doesn't take over seven years to finalize. Without such a list, the UH was incapable of consulting and engaging with Native Hawaiian stakeholders and the broader Hawaiian community. It's uncertain if the newly formed CMS has since compiled a consultation list. If so, UH has still failed to engage and consult with Native Hawaiian stakeholders on a timely and frequent basis.**

**4. UH’s ineffective management and unlawful actions of its own employees and individuals under their jurisdiction have resulted in adverse impacts upon Mauna Kea’s natural and cultural resources. UH personnel and OMKM staff have failed to follow the existing rules and protocols as outlined by the CMP.**

Case-in-point, UH personnel (i.e. OMKM, MKSS, etc.) have been directly involved in the destruction and desecration of cultural resources on Mauna a Wākea. In 2013, the archaeological monitor for the geotechnical boring at the proposed TMT site identified cultural items consisting of “*the erection of two small upright boulders and placement of a ti leaf bracelet.*” It was also reported that these “*two upright stones were later dislodged by OMKM staff.*”<sup>3</sup> During the second contested hearing for CDUP HA-3568, a OMKM staff member testified under cross examination that he was the individual identified in this monitoring report who was involved with this incident. He testified further that he had intentionally knocked down an upright stone associated with Native Hawaiian cultural practices that was near the northern boundary of the proposed TMT site on the northern plateau and that he did not consult with Kahu Kū Mauna prior to taking this action. At that time, he was the cultural monitor working on behalf of OMKM at the site. In addition, he disclosed that Mauna Kea Rangers remove *ho’okupu* and items left on *ahu* even though they do not have the authority to do so. Also, he verified that he was not very familiar with the rules and policies pertaining to the protection of Native Hawaiian cultural practices and resources even though he was initially hired as the cultural advisor to OMKM in 2012.<sup>4</sup>



Figure 13. Newly placed upright boulders and ti leaf bracelet at the northern boundary of the TMT area.

<sup>3</sup> *Archaeological Monitoring Report: Geotechnical Boring for the Proposed Thirty Meter Telescope (TMT) in the Astronomy Precinct of Mauna Kea*, October 2013. Prepared by: Genevieve L. Glennon B.A. and Robert B. Rechtman, Ph.D. (p. 12)

<sup>4</sup> Wally Ishibashi Testimony. 11/16/16, Vol. 9 at 135-175.

In 2015, a Mauna Kea Support Services (MKSS) employee, without any authorization or consultation with the Kahu Kū Mauna cultural advisory group, initially bulldozed an *ahu* (altar) named Ka Uakoko associated with Native Hawaiian cultural practices. As it was reported by [Hawai‘i News Now](#), *“They dismantled our altar without the right protocol, without even having a cultural person there to walk them through it the right way -- they just grabbed the bulldozer and tossed it off to the side. So yeah, it’s very hurtful,”* stated JoJo Henderson. *“There’s cultural protocols that need to be put into effect. There’s administrative protocols and they’re not following those either. Everytime the chancellor or the president of the university goes out into the community and say that Hawaiian culture ‘means something. It is very important. It is significant’. It obviously is not,”* said Tiffnie Kakalia, the Kahu Kū Mauna Vice Chair. Kakalia says this incident is just the latest in a string of failures by the OMKM and UH to consult with Kahu Kū Mauna. *“The fact of the matter is the Hawaiian community is not being heard and not being valued, although it is being said that we are,”* said Kakalia.



Ka Uakoko *ahu* before it was bulldozed off the side of the embankment.

These incidents are only two recent examples that have been documented in detail. It is known that other incidents involving the destruction, desecration, or dismantling of cultural resources associated with Native Hawaiian practices have occurred through the actions of UH personnel.

**UH should adopt, implement, and enforce rules and procedures for the conduct of their staff and personnel as well as astronomy personnel operating within the Mauna Kea lands and resources under their management.**

**5. BLNR/DLNR failed to ensure that UH was in compliance with State laws with the BOR’s adoption of the 2022 *Master Plan for the University of Hawai‘i Maunakea Lands*. UH failed to prepare an Environmental Impact Statement (EIS) for this new Master Plan in accordance with Hawai‘i Revised Statutes, Chapter 343.**

Notwithstanding four state audits and community members and organizations, including Kanaka Maoli, expressing concern and providing testimony dating back to the 1970’s about the adverse impacts and threats to Mauna Kea, the State and the UH have continuously neglected their legal duties resulting in over [50 years of mismanaging](#) this revered and sacred mountain. Instead, they have prioritized astronomical development at the expense of properly caring for Mauna Kea’s natural and cultural resources. In addition, they have taken adversary positions and actions against Native Hawaiian cultural practitioners which have resulted in detrimental impacts upon Kanaka Maoli and their cultural practices and traditions.

Thorough examination of the UH’s own documents disclose that,

From a cumulative perspective, the impact of past and present actions on cultural, archaeological, and historic resources is substantial, significant, and adverse; the impacts would continue to be substantial, significant, and adverse with the consideration of the Project and other reasonably foreseeable future actions. (TMT FEIS, p. S-8)

**BLNR/DLNR should assume their prime responsibility to require UH’s compliance with all their plans associated with the lands of Mauna Kea.**

**V. Adverse impacts upon the sacred *piko* and resources of Mauna a Wākea**

**The actions of the BLNR/DLNR and UH to permit and advance the overdevelopment of astronomical facilities within an environmentally and culturally sensitive landscape has caused adverse impacts and irreparable harm upon the sacred *piko* as well as the natural and cultural resources of Mauna a Wākea.**

Mauna a Wākea is the inoa (name) reverberated by the ancestral guardians connected to this sacred mountain. In English, it literally means, "Mountain of Wākea". It’s within this name that unfolds the understanding of the significance of this mountain. Wākea (Sky Father) is personified in the atmosphere and heavenly realm that envelops Papahānaumoku (Mother Earth). As such, this mountain, unlike any other in the Pacific, pierces above the clouds into the realm of Wākea. It is the tallest mountain in the world over 33,000 feet when measured from the ocean floor to its summit. This mountain is also referred to as “Mauna a Kea”, “Mauna Kea”, or just “Mauna”.

According to *'ike kupuna*, indigenous knowledge and ancestral insight, the top of Mauna a Wākea is one of the three most sacred and significant places on Hawai'i Island. It is indeed a sacred *piko*. It is difficult to explain to those who have forgotten or lack an understanding of why such a place as Mauna a Wākea is sacred. The insight and knowledge of Mauna a Wākea as being *kapu* (sacred) was known from the remote past of the ancient ones. It is for this reason that amongst the countless ancestors of Kanaka Maoli and numerous *ali'i* (chiefly) dynasties that lived in these islands, they never built any large *heiau* (temples) on the summit in this realm that is considered *kapu*. This is the reason that none of the Mauna Kea archaeological surveys have ever located a traditional man-made structure on the summit. In the times of our ancestors, prior to structures being constructed, one would consult with individuals such as *kahuna kuhikuhi pu'uone* who specialized in protocols associated with the selection of such sites. In addition, consultation and direct communication between intermediaries and those of the ancestral realm associated with those places was an essential and integral part of the process so as not to create a physical and/or spiritual disturbance, disconnection, or imbalance between man and his *akua*, and between man and his environment. We charge that this process of consultation with those recognized as the ancestral *akua*, *kupua*, and *kupuna* of Mauna a Wākea was not done by the BLNR/DLNR, UH, or any astronomy projects built on the mountain.

There are several references in reports such as the Mauna Kea CMP and 2000 Master Plan acknowledging the sacred attributes of the landscape of Mauna a Wākea. A sampling of references from these reports that substantiate the sacredness of this mountain are copied below:

The physical prominence of Mauna Kea as well as its stationing nearest to the heavens holds a spiritual significance for the Hawaiian people, a significance that can be expressed in likening the mountain to a sacred altar. (CMP, p 1-3)

For some Hawaiians, Mauna Kea is so revered that there is no desire to ascend it, no desire to trespass on what is considered sacred space. Simply viewing the tower, the mountain, from afar, both affirms its presence, and reaffirms the sense of connection with both place and personage. For this reason, many Hawaiians feel that activities on Mauna Kea that lead to visible alterations of the landscape not only have a significant effect on the mountain itself, but also have a damaging effect on everything and everyone that is physically, genealogically, spiritually, and culturally tied to Mauna Kea. (CMP, p 1-4)

The ancient saying "*Mauna Kea kuahiwi ku ha'o i ka mālie*" (Mauna Kea is the astonishing mountain that stands in the calm) (Pukui 1983: No. 2147), expresses the universal feeling experienced by all who come in contact with this special place. Standing tall over the Island of Hawai'i, Mauna Kea is home to vast physical, natural and cultural resources (Figure I-1). From early adze makers to modern day astronomers, Mauna Kea has long been a special place for work, worship, and reflection. For native Hawaiians, both ancient and modern, the feelings for Mauna Kea go beyond wonder and

astonishment, to the recognition of the mountain as a sacred domain. These profound feelings of reverence are expressed in the saying: “*O Mauna Kea ko kākou kuahiwi la‘a*” (Mauna Kea, our sacred mountain). As with other ethnic cultures throughout the world, early Polynesians believed their highest points of land were the most sacred; and Mauna Kea having the highest mountain top in all of Pacific Polynesia, was considered the most sacred place of all. Standing tall over the island of Hawai‘i, Mauna Kea was host to early Hawai‘ian traditions which included religious practices, study of the heavens, and tool making in the Keanakāko‘i adze quarry. (2000 Master Plan, p I-1)

In an effort to erase the well-known and previously documented sacredness of Mauna Kea, UH purged all references to the sacred nature of this *piko* that’s been referenced in various accounts. In fact, the 2000 Master Plan included at least 25 references to this mountain’s sacredness. Whereas, the 2022 Master Plan reduced it to only one flawed reference as such, “*for some the mauna is sacred.*”

The greatest obstacle in the protection of sacred places is a lack of understanding of why these places are significant and so special. It has been forgotten when humans interacted with the natural forces and energies of this Earth. Those who have forgotten are products of their social, educational, and/or religious systems. From the modern mindset, most people can recognize the significance of a church building, appreciate the majestic and sacred architecture of a cathedral or synagogue, or be in awe of ancient pyramids and temple structures. However, it seems more difficult for modern minds to recognize that places in nature which bear no special markings or buildings are also considered sacred.

There are countless mountains around the world considered sacred by cultures past and present. These holy mountains are also keystones to indigenous religions that regarded these areas as the abodes of certain gods, goddesses, deities, divine beings, natural forces, and spirits. In addition, pilgrimages to sacred mountains have been taking place for thousands of years. Whether it is Mauna a Wākea, Mount Fuji in Japan, or Mount Shasta in California, their sacredness has resonated from centuries past.



Mauna a Wākea, Hawai‘i

<https://www.usgs.gov/volcanoes/mauna-kea/mauna-kea-will-erupt-again>



Mount Fuji, Japan

([http://images.pictureshunt.com/pics/m/mount\\_fuji\\_scenery-12120.jpg](http://images.pictureshunt.com/pics/m/mount_fuji_scenery-12120.jpg))



Mount Shasta, California

(<http://www.vibrakeys.com/wordpress/wp-content/uploads/2010/06/MountShasta-HolyMountain.jpg>)

Sacred mountains such as Mauna a Wākea, due to their geological composition and extreme height, are a *piko* (portal) that allows for the transference of energy from one source to another. This understanding is reflected in the traditional Hawaiian concept of the "triple *piko*" of a person. In essence, the *piko* on the summit of the mountain is comparable to the *piko* located on the tops of one's head at the fontanel. This perspective is also described in the Cultural Anchor of the CMP. [an abbreviated description is recopied below]

Mauna Kea is "*ka piko o ka moku,*" which means "Mauna Kea is the navel of the island." Understanding the word *piko* may give a deeper understanding of why Mauna Kea is the *piko*, or navel, of the island.

In terms of traditional Hawaiian anatomy, three *piko* can be found. The fontanel is the *piko* through which the spirit enters into the body. During infancy, this *piko* is sometimes "fed" to ensure that the *piko* becomes firm against spiritual vulnerability. For this reason, the head is a very sacred part of the anatomy of the Hawai'i native

The second *piko* is the navel. This *piko* is the physical reminder that we descend from a very long line of women. The care of this *piko* ensured two things: the healthy function of the child and the certification that the child is a product of a particular land base.

The final *piko* is the genitalia. The genitalia are the physical instruments that enable human life to continue. The health of all *piko* ensures that the life of the native person will rest on an axis of spirituality, genealogy and progeny.

When we understand the three *piko* of the human anatomy, we may begin to understand how they manifest in Mauna Kea. Mauna Kea as the fontanel requires a pristine environment free of any spiritual obstructions.

It is this *piko* on top of the summit where energies and life forces flow from the Creator and higher dimensions, through the realm of Wākea, and then into the Earth. Likewise, the *piko* on top of one's head where life force energies from the Creator and higher dimensions flows into one's body. On 4 March 2011, a photograph was taken from Waimea by Kehaulani Marshall showing a portal opening above the *piko* of Mauna a Wākea when such an event was occurring.

However, when the *piko* of the summit is obstructed with the physical excavation of the landscape, asphalt and cement pavement, metal posts implanted in ground, buildings, and construction, it curtails, restricts, or prevents this pure flow of energy. Thus, the development on the summit is causing adverse impacts and significant obstructions to the life force energies that flow into these islands through this *piko*.



Portal opening above the *piko* of Mauna a Wākea - Photo by Kehaulani Marshall

In addition, Mauna a Wākea anchors a very complex multi-dimensional over-fold, and does so through its very conscious geometric grid, complex frequencies, and unique electromagnetic field. The summit is also an area where vortexes of energy occur.

Vortexes are swirling eddies of electrical and magnetic energies. They are a function of the gravity and electromagnetic grids. Based upon the natural energy pattern due to the earth's

polarity, vortexes generally spin counterclockwise above the equator and clockwise below it. Vortexes distribute energy outward in what is termed electrical vortexes, and inward in what is termed magnetic vortexes. Some function as both. Mauna a Wākea is an example of an inward and outward vortex-portal complex.

However, the man-made electrical substation, power lines, and high voltage current that runs to the top of the summit for the existing telescopes is interfering and disturbing the electromagnetic fields and vortexes that naturally occur on the mountain..

Also, Mauna a Wākea resonates in harmonic oscillation with Mount Shasta in California, Mount Fuji in Japan, and other specific mountains around the world. As a result of this energetic connection between these mountains, these other areas are also impacted by what occurs on Mauna a Wākea.

## **VI. Adverse impacts upon ancestral *akua*, *kupua*, and *kupuna***

**The actions of the BLNR/DLNR and UH to permit and advance the overdevelopment of astronomical facilities within an environmentally and culturally sensitive landscape has caused adverse impacts and irreparable harm upon those *akua*, *kupua*, and *kupuna* of Mauna a Wākea.**

The term “*akua*” is being used in this document in a broad cultural context to be inclusive of gods, goddesses, deities, devas, nature spirits, divine beings, and natural forces. The ancestral *akua* that were recognized by our *kupuna* are those primarily embodied in the natural forces of nature. Likewise, they could take multiple forms (*kinolau*) such as animals, plants, and natural elements. Some were identified with names and some were not. The use of *akua* as a common noun is distinct and different when used as “Akua” or “Ke Akua” in the proper name form which typically refers to the Creator or God. The term “*kupua*” is used in this document in reference to other entities or supernatural beings who also have the ability to assume different forms.

Individuals with a western mindset and a lack of understanding might choose to dismiss the existence of *akua* and *kupua* completely as mythological folklore. While others might choose to dismiss their existence due to personal religious persuasions and/or social upbringings. The Earth, Universe, and Cosmos is teeming with life in many variant forms, forms vastly different from our own. Yet the consciousness inside is of the same Creator, same creative divinity as our own. It is narrow minded to believe that the human physical form is the only form of life.

There are several ancestral *akua* connected to Mauna a Wākea that have been recounted by our *kupuna* in their oral traditions and subsequently articulated in literature. Some of these accounts are referenced in the document, *Mauna Kea - Ka Piko Kaulana O Ka 'Āina* (2005), prepared by Kepā and Onaona Maly of Kumu Pono Associates, LLC for the OMKM. Also, in several documents, there are various references regarding the ancestral *akua* along with their connections to the sacred landscape on the summit of this mountain as noted below:

As a result of his exhaustive studies, Kepā Maly identified many traditional cultural properties on Mauna Kea. He documented ongoing traditional cultural practices associated with several of these. It is a sacred landscape that provides a connection, genealogically, physically, and spiritually to ancestral realms. The mythical creation of Mauna Kea is part of a Hawaiian cosmology that establishes a relationship between all things animate and inanimate. (CMP, p 1-2)

Native Hawaiian traditions state that ancestral *akua* (gods, goddesses, deities) reside within the mountain summit area. These personages are embodied within the Mauna Kea landscape – they are believed to be physically manifested in earthly form as various *pu‘u* and as the waters of Waiau. Because these *akua* are connected to the Mauna Kea landscape in Hawaiian genealogies, and because elders and *akua* are revered and looked to for spiritual guidance in Hawaiian culture, Mauna Kea is considered a sacred place. (CMP p 5-3)

The origins of Maunakea and its central place in Hawaiian genealogy and cultural geography are told in *mele* (poems, chants) and *mo‘olelo* (stories, traditions). Native Hawaiian traditions state that ancestral *akua* (gods, goddesses, deities) reside within the mountain summit area. Several natural features in the summit region are named for, or associated with, Hawaiian *akua*; these associations indicate the importance of Maunakea as a sacred landscape. Each part of the mountain contributes to the integrity of the overall cultural, historical, and spiritual setting (TMT FEIS, p 3-11).

Members of the Flores-Case ‘Ohana have connected with some of the *akua*, *kupua*, and *kupuna* of Mauna a Wākea through genealogical ties as well as through customary and traditional practices. Through *‘ike kupuna*, indigenous knowledge and ancestral insight, the following information and understanding were provided about those affiliated with this sacred mountain.

(Guardian - name not disclosed at this time), a guardian force of nature from the depths of Mauna a Wākea came forth to provide the following insight. [Note: It was felt as though it was a male presence and so his gender is referenced as such. Such beings, in truth are often not of either gender, but rather espouse certain frequencial attributes that humans define as male or female.] In a ceremony conducted on the summit on 8 May 2011, the presence of this guardian was personally witnessed. He came from the very depths of the mountain, way below the crust of the ocean floor, one who carries the ancient knowledge. He stated, “I come from the depths, the ancient *pōhaku*.” He is the guardian of the bottom, deep below in the earth. He was filled

with joy that we were there to listen. However, he was also filled with sadness because the observatories on her (the mountain's) shoulders and breasts were causing such desecration. He was aware of her feelings because they are all connected. Other guardians on the mountain have been awakened and are on alert regarding proposed (TMT) development. They are all in full communication with the Creator who can see all things through Wākea.

He declared that those who are planning to cause further desecration on Mauna a Wākea are "ignorant and lost." In addition, he explicitly stated a message to them, "You are responsible for what you do not know and you will be held responsible." He also mentioned that everyone is accountable for their own actions. Furthermore, he emphasized that, "You don't know what is coming when you do this, you have been warned." He is the one who has the power to shake the earth. Such a decision is not his, but would come from the Creator if needed to restore balance on the mountain.

(Guardian – rough English translation of name, “The one who sees far into the heavens”), an ancestral guardian connected to a *pōhaku* and previously unidentified site within the vicinity of the proposed TMT site. This guardian explained the significance of many of the sites on the northern plateau as they are interconnected like a large star map. Individuals from certain family lines were guided to come up to the mountain during certain times of the year to reestablish, construct, align, activate, and/or maintain these sites. The TMT construction activities of excavating, grading, and rock-crushing in the area have already caused a great disturbance amongst these sites and guardians. This ancestral guardian also reiterated some of the significant impacts that would result from the building of this telescope and the consequences of attempting to pursue this project on this sacred landscape.

Poliahu, “*ka wahine i ke kapa hau*” (the woman in the mantle of snow), is at times referred to as an *akua wahine*. She is a part of Mauna a Wākea and creates the rain, snow, hail, and sleet on this mountain. She serves as caretaker and guardian for the mountain and grants permission to certain spirits coming to the mountain. Poliahu has two attendants assisting her, Lilinoe and Lihau. She is a part of the landscape features with a highly evolved consciousness. Both oral and written Hawaiian traditional accounts have documented her connection to Mauna a Wākea. We have been present at times when she has shared her concerns about the existing and proposed further desecration on the mountain. She has explicitly remarked that she does not want the existing and any new observatories on this sacred mountain. They are blocking the *piko* on the summit. If she is dislocated due to the new telescope, it might create new problems and affect the weather patterns on the mountain as well as other areas on the island.

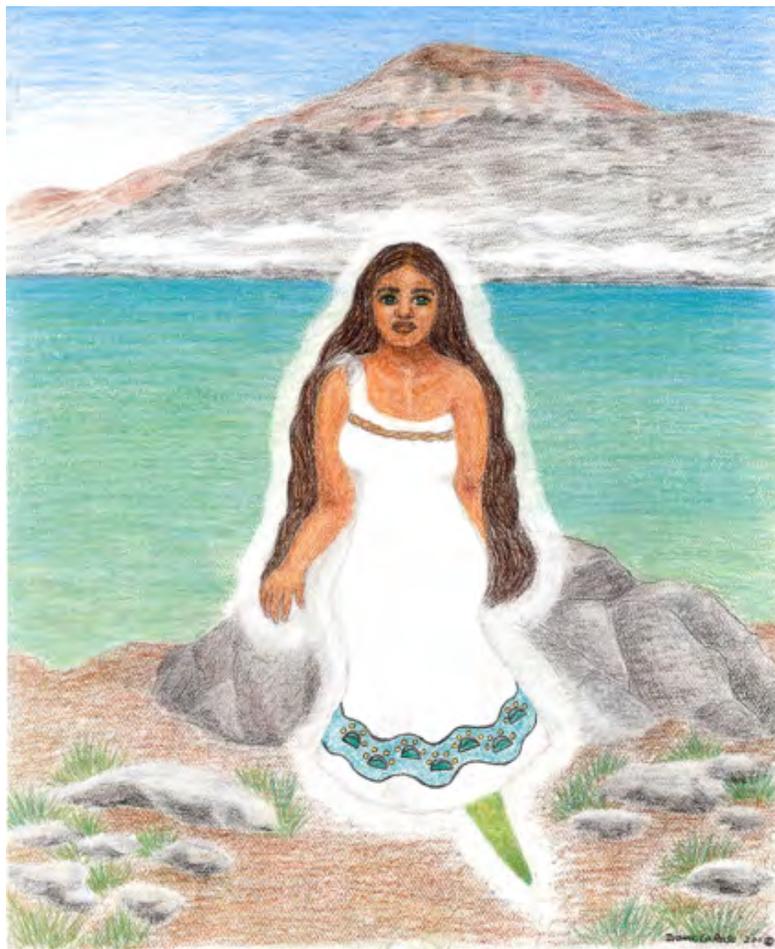


Poliahu by Herb Kawainui Kane

Mo‘oinanea, *mo‘o wahine* and guardian of Lake Waiau, is at times referred to as a *kupua*. She is described in several traditional accounts and has genealogical ties to the Mauna a Wākea. Firstly, it is difficult to explain or define who Mo‘oinanea is for those who may lack an understanding. The existence of her as a *mo‘o wahine* goes beyond anyone’s personal belief, cultural attributes, or religious persuasion. We contend that just because other individuals are not able grasp this understanding, do not easily dismiss Mo‘oinanea’s existence on Mauna a Wākea. Mo‘oinanea is a revered and significant figure in both oral and written Hawaiian traditional accounts that have documented her connection to Mauna a Wākea. She is able to communicate with individuals who have the cultural sensitivity and ‘gift’ to see, hear, and interact with her.

There are numerous traditional and family accounts describing the episodes, sightings, and interactions with *mo‘o* in these islands of Hawai‘i. They are often known to reside in freshwater tributaries, ponds, coastal areas, forests, and mountain zones. Their presence is not only documented in Hawai‘i, but their existence has been documented throughout the ages and by cultures around the world. These benevolent and fully conscious beings exist, and are as much a part of our Earth as humanity. They possess supreme divine intelligence and are extremely advanced. They are protectors of humanity and of the planet and are often closely aligned to the earth’s electromagnetic and crystalline energies and fresh waters. These *mo‘o* have been on the Earth since the beginning. They are indeed physical. They exist primarily in a higher parallel dimension, but do also bodily exist in our physical world. They do reproduce, and the ones on

our planet in the present, were all spawned and birthed on the earth. Likewise, they do have physical life spans and also have their own hierarchy and distinct genealogies.



Mo'oinanea by Diana LaRose

We have been present at times when Mo'oinanea has shared her personal accounts about herself and her family as well as described the type of cultural traditions our *kupuna* of old practiced on the Mauna a Wākea including pilgrimages to the top of the mountain. In addition, she has expressed her concerns about the existing observatories and proposed further desecration on the mountain. She has shared that the existing observatories have created obstructions and hazards for those who reside on Mauna a Wākea. Likewise, the proposed new observatory will adversely impact Mo'oinanea and others who dwell on the summit. When these guardians and caretakers of the natural elements on Mauna a Wākea are negatively impacted by human's actions, it will also impact the natural elements that are integrally connected to them. Consequently, these actions will also impact us as humans as the natural elements and

environment start to shift and change. There is an imbalance and disharmony that has been created on this sacred *piko*.

*Kupuna*, ancestors, including *ali'i* of the past, are also on Mauna a Wākea serving in different capacities or having come to this mountain under different circumstances. Some serve as guardians of various sites and places on the mountain. Others had ventured up to this sacred mountain during various different periods of time. Members of the Flores-Case 'Ohana have encountered and engaged with these *kupuna* on several occasions through our cultural practices, ceremonies, and visits on the mountain. One such group that we had encountered had fled up towards the top of their sacred mountain at the time after western contact (circa mid-1800's) when foreign diseases and epidemics swept through the villages along the Kona coast. Many of them were being persecuted by foreigners, particularly missionaries, during this time when many were dying by the hundreds. So for those who could, they fled up to the mountain to die in the realm closer to Wākea. One *kupuna* recounted this account as she was the last one alive amongst her family and others in her group. She sang to them as they each had passed away until she was the very last one to pass. There were literally hundreds of them who had passed during these times and their remains are scattered around the mountain depending upon where they ended up.

## **VII. Adverse impacts upon cultural resources and historic sites**

**The actions of the BLNR/DLNR and UH to permit and advance the overdevelopment of astronomical facilities within an environmentally and culturally sensitive landscape has caused adverse impacts and irreparable harm upon those cultural resources and historic sites connected to Kanaka Maoli and their practices.**

The BLNR/DLNR and UH have failed to follow the CMP and Cultural Resources Management Plan (CRMP), a sub-plan of the CMP, which provided OMKM with the tools it needs to meet its cultural resource management responsibilities. It begins by identifying key management objectives and goals that can be used in making budget decisions, assessing staffing needs, and setting up contracts for specialized services.

Likewise, BLNR/DLNR and UH have failed to follow the major objectives of the 2000 Master Plan including, but not limited to those noted below:

- promoting a greater understanding of the rich cultural heritage of Mauna Kea;
- preserving and managing cultural resources in a sustainable manner so that future generations will be able share in and contribute to a better understanding of the historic

properties that exist in the summit region, which is of major cultural significance to Hawaiians;

- maintaining opportunities for Native Hawaiians to engage in cultural and religious practices; and
- preserving the cultural landscape for the benefit of cultural practitioners, researchers, recreationalists, and other users.

Archaeologists contracted by the UH and astronomy projects to conduct archaeological inventory surveys and reports on Mauna a Wākea have failed to consult directly with cultural practitioners. As a result, these surveys have often misidentified historic sites, misinterpreted cultural practices, distorted Kanaka Maoli knowledge, and excluded traditional cultural properties. Furthermore, these surveys and reports tend to regurgitate information in past reports that were at times incomplete or inaccurate.

In addition, the State Historic Preservation Division has historically failed to protect the cultural resources and historic sites on Mauna a Wākea and have failed to consult with cultural practitioners during their reviews of these inventory surveys and reports.

In 1997, SHPD instituted a process of recording locations termed “find spots,” which are cultural resources that are either obviously modern features or features that cannot be classified with any level of confidence as historic sites because of their uncertain age and function. This action has put the status and protection of many actual historic and cultural sites in limbo.

Also, the BLNR/DLNR has failed to complete the CMP management action **CR-2** to finalize the application of designating Mauna Kea as a Traditional Cultural Property (TCP) under the National and State Historic Registers of Historic Places. The entire mountain region of Mauna Kea from approximately the 6,000 foot elevation to the summit, including the Mauna Kea Science Reserve, was identified in the Cultural Impact Assessment [CIA] Study (1999) as a potential TCP.

## **VIII. Adverse impacts upon Kanaka Maoli customary and traditional practices**

**The actions of the BLNR/DLNR and UH to permit and advance the overdevelopment of astronomical facilities within an environmentally and culturally sensitive landscape has caused adverse impacts and irreparable harm upon those cultural sites and our traditional and customary Kanaka Maoli cultural, spiritual, and religious practices.**

These practices are directly connected to the cultural sites and landscape of Mauna a Wākea which is further affirmed in the 2000 Master Plan:

All aspects of Hawaiian life were steeped in ritual. For the Hawaiian people, spiritual beliefs, cultural practices and all facets of daily life were intricately bound to the natural landscape of the islands. (p. V-2)

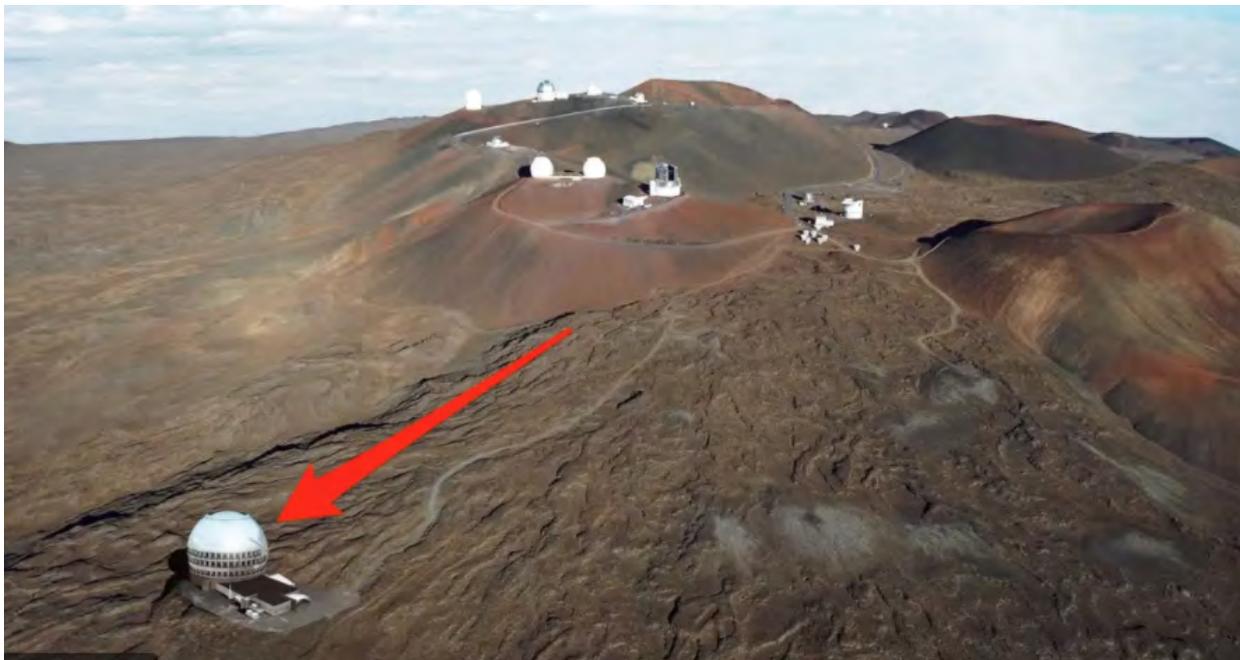
Thus, the destruction and desecration of cultural sites and the landscape, directly diminishes or extinguishes the associated practices. Cultural practitioners have been literally pushed off the summit (13,290 ft./4,050 m. elevation) of Mauna a Wākea due to the existing astronomy development. The once open space and view corridors on Kūkahau‘ula have been visually impaired by the existing telescopes and observatories. A cultural practitioner’s view planes and vantage points are blocked by several of these imposing structures. In addition, the constant noise and buzzing sounds from the electrical components of these observatories have impaired the once serene and peaceful environment.



Likewise, the proposed TMT project would forcefully push cultural practitioners even further below the 11,000 ft. elevation level on the northern plateau to find an unobstructed view and undisturbed area on this side of Mauna a Wākea as shown in the rendering below.

Furthermore, the TMT project proposes to be built in an undeveloped area amongst the hundreds of the documented and undocumented ahu (shrines) and cultural sites. The concentration and placement of these sites on this northern plateau was not randomly done by our *kupuna*. They were erected and established with specific intentions. Many of these ahu are interconnected similar to a star map. Embedded within these *ahu* and stones is *'ike kupuna* and ancestral knowledge along with ancestral guardians. As such, construction of the TMT observatory in this vicinity would sever our past, present, and future generational connections to the *'ike kupuna* and ancestral knowledge implanted at these sites. With the understanding that

many of these sites serve as depositories of ancient wisdom as well as multi-dimensional portals, the massive extent of destruction proposed in this culturally sensitive landscape would also adversely impact our Native Hawaiian customary and traditional practices that are still connected to these sites. Once this landscape is excavated by the proposed TMT construction, it can never be repaired and restored. Many of these sites are interconnected and the detrimental impact on those in the vicinity of the proposed TMT site would also negatively impact the other sites and ancestral guardians connected to them.



A rendering of TMT in its proposed location.

<https://www.businessinsider.com/thirty-meter-telescope-hawaii-protests-2015-10>

On the northern plateau, many of the sites have both visual and energetic alignments with each other as well as with other noted natural features such as the surrounding *pu'u*. Due to the massive height and size of the TMT observatory, if built it would cause significant visual, physical, and energetic obstructions amongst these sites as well as adversely impact Kanaka Maoli in a similar way.

Other detriments to Kanaka Maoli practices on Mauna a Wākea was the extent and manner in which policies were developed by the UH to further curtail, extinguish, and criminalize such practices. These policies were developed without adequate consultation with cultural practitioners and adopted with a 'rubber-stamped' process for approval. Specific aspects of these policies are unjustified and are considered a grievous attack against Kanaka Maoli practices. Examples of these policies are listed below:

### ***Policy for CR-5***

#### The Placement and Removal of Offerings

1. Offerings shall not be placed on existing historic properties, roadways, pathways or existing structures or areas used for operations.
2. Offerings including food will be removed.
3. Any offerings that present health, safety or environmental concerns issue shall be removed.
4. All applicable Hawaii state laws and regulations shall apply.

Comments re *Policy for CR-5*: This policy that prevents the placement of offerings on “*existing historic properties*” as well as excluding food offerings contradicts fundamental customary and traditional practices of Native Hawaiians. HAR §13-276-2 defines a “**historic property**” as “*any building, structure, object, district, area, or site, including heiau and underwater site, which is over fifty years old.*” As such, this policy prevents the placement of an offering on or at Kūkahau‘ula which is actually a historic property and also identified as a Traditional Cultural Property (SIHP No. 50-10-23- 21438) occupying an area of approximately 463 acres. The irony to this policy is that the existing telescopes were allowed to be placed on the environmentally and culturally sensitive Kūkahau‘ula, yet a cultural practitioner would be prevented from placing a *ho‘okupu* (offering) on this same Kūkahau‘ula due to this policy. Likewise, a cultural practitioner would be prevented from placing a *ho‘okupu* (offering) on any of the existing *ahu* (shrines) if they’ve been individually identified as a historic property. Moreover, the entire Mauna Kea Science Reserve is within the Mauna Kea Summit Region Historic District (SIHP No.50-10-23-26869) which was determined eligible for listing on the National Register of Historic Places. Since this historic district is also considered a “historic property”, this policy prevents the placement of an offering anywhere in the MKSR. [see Figures 2-4 and 2-6 of the Cultural Resources Management Plan, a sub-plan of the CMP]

### ***Policy for CR-6***

Visitation and use of ancient shrines for Hawaiian Cultural observances is allowed on Maunakea lands managed, on a case by case basis, by the University of Hawaii provided the use does not violate Chapter §6E of the Hawaii Revised Statutes. The Office of Maunakea Management shall be notified a week prior to any such visit. Notification can be in writing or via email. See Office of Maunakea Management website for contact information. If there is a group of more than 10 people who wish to visit an ancient

shrine they must also submit a Special Request form found on the Mauna Kea Visitor's Center website at <http://www.ifa.hawaii.edu/info/vis/visiting-maunakea/research-group-visits-and-military/group-visits.html> in addition to the notification of the Office of Mauna Kea Management.

Comments re *Policy for CR-5*: This policy unnecessarily and unjustly singles-out Native Hawaiian cultural practitioners in having to notify and justify their practices to the OMKM. What guidelines will be applied and who is qualified in the OMKM to determine “*on a case-by-case basis*” if a visitation to a cultural shrine is appropriate or not? Policy for CR-5 already prevents the placement of offerings at these shrines, this policy further curtails access to these cultural sites. Also, there isn't any justification for cultural practitioners being required to submit a Special Request form for a group of more than 10 people visiting a cultural site. In comparison, a Special Request form isn't required for a similar sized group visiting any *heiau* or other cultural shrines within the State Parks.

#### ***Policy for CR-7***

Policy for erecting and maintaining new cultural features such as, for example, shrines, alters or ahu:

1. Any Native Hawaiian who would like to construct a new cultural feature shall, prior to any construction or preparation for construction, register the proposed site of the new cultural feature with the OMKM. OMKM will keep a record of the location and contact information of the responsible party. Responsible party means the person who registers the proposed site.
2. New cultural features shall be placed out of plain sight, or a minimum of 100 yards from existing roads and in designated areas to discourage copycat behavior. Plain sight includes areas close to or adjacent to roads, parking areas, driveways or within 100 yards of buildings.
3. New cultural features shall not be placed in any areas used for operations.
4. Any and all new cultural features shall not be placed in any area that would create a risk to public health, safety or the environment.
5. New cultural features shall be placed at least 200 feet from existing historic sites.

6. New cultural features shall be made of natural materials from the surrounding area, but shall not be removed from existing historical sites. Removal, disturbance or damage to historic sites is a violation of state law, HRS §6E-11.
7. New cultural features are to be maintained by the responsible party .
8. Upon observation that the structure has been disturbed or damaged, OMKM shall contact the responsible party.
9. If the new cultural feature is constructed from or includes in its composition materials that are not from the surrounding area it will be removed and the incongruous materials disposed of.
10. New cultural features that have not been registered with the OMKM prior to construction may be subject to removal.
11. All applicable Hawaii State laws and regulations shall apply.

Comments re *Policy for CR-7*: This policy basically eliminates the established customary and traditional practice of Native Hawaiians erecting an *ahu* (shrine) on Mauna a Wākea that is evidenced by the hundreds of other shrines erected on this sacred mountain by our *kupuna*. Part 2 of this policy stipulates that these “*cultural features shall be placed out of plain sight, or a minimum of 100 yards from existing roads*” and further states, “*Plain sight includes areas close to or adjacent to roads, parking areas, driveways or within 100 yards of buildings.*” The irony to this policy is that the existing telescopes were allowed to be visible from all parts of the summit (including from the other parts of the island), yet a cultural practitioner would be prevented from erecting an *ahu* anywhere visible from “*plain sight*” or “*a minimum of 100 yards from existing roads*”. Based upon these guidelines, practically the entire summit and all along the roadways would be restricted. In addition, Part 5 prevents *ahu* from being “*placed at least 200 feet from existing historic sites.*” It is very apparent that these policy stipulations were developed without consultation with cultural practitioners associated with the cultural practice of building and consecrating *ahu*. In a similar manner as done by our *kupuna*, the placement and site selection for an *ahu* is not just randomly done. They are erected and established with specific intentions and might be interconnected with existing sites regardless if they are historic or are in plain sight.

In the development of these policies, UH has misconstrued Hawaii State Constitution, Article XII, Section 7 which 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. [Add Const Con 1978 and election Nov 7, 1978]”*

In respect to XII, Section 7, UH erroneously implied, “*While traditional and cultural rights are recognized as an important aspect of our political heritage the Hawaii State Constitution also tasks the state with the regulation of these rights.*”

Comments re this statement: Firstly, these rights are an important aspect of our **cultural heritage** vs “*our political heritage.*” The State is actually **tasked with protecting these rights** vs. “*the regulation of these rights.*”

**The UH’s process for developing and approving these policies lacked any adequate consultation with Native Hawaiian stakeholders, Kanaka Maoli community, Hawaiian organizations, and cultural practitioners. Furthermore, when comments were provided at meetings, they were systematically ignored. Consequently, the manner in which these policies were developed are reflective of the adversary actions the OMKM has enacted against cultural practitioners and the failure to protect the practices and rights of Native Hawaiians.**

## CONCLUDING REMARKS

Members of the Flores-Case ‘Ohana have participated at all levels of the public review process pertaining to Mauna a Wākea such as attending board meetings and hearings, submitting testimony, entering into contested case hearings, and filing legal appeals. Based upon our personal experience, it’s very evident that the State (inclusive of the Governor, Attorney General Office, BLNR, DLNR, UH, BOR, OMKM, CMS, their contracted law firms, hearing officers, other agencies and individuals) have taken very adversary positions and actions against Native Hawaiian stakeholders which have resulted in detrimental impacts upon our cultural practices and traditions associated with Mauna a Wākea. Likewise, the State has systematically ignored community and Native Hawaiian concerns dating back to the 1970’s regarding the overdevelopment of the environmentally and culturally sensitive landscape of this sacred mountain.

The comments presented in this document highlight significant deficiencies and lack of accountability in this review process of the proposed Supplement. Comments put forth are specific to the items presented and were not intended as an assessment of all aspects of the proposed CMP Supplement, 2009 CMP and associated sub-plans as there was insufficient time and resources to do so.

The true aspect of stewardship entrusted to the BLNR/DLNR as well as the UH for our precious public lands in conservation districts is to ensure that these significant areas are acknowledged, preserved for present and future generations, and not systematically destroyed. In essence, the astronomy development on the summit of Mauna a Wākea has been conducted as a commercial enterprise under the guise of science, educational, and economic opportunities that has resulted in the cumulative impacts upon the natural and cultural resources as being substantial, significant, and adverse due to over 50 years of mismanagement.

Everyone is responsible and accountable for their intentions and their actions in the *wao akua*, this sacred space known to our *kupuna* as Mauna a Wākea. On this *mauna*, one must interact in a manner that is **pono**, upright in the presence of the ancestral connection that binds us through space and time to teachings, traditions and lifeways that have continued because of the *kuleana* that has been passed down from one generation to the next.

It is important to remember that many peoples, including Kanaka Maoli, have a reverential relationship with the living Earth as our 'Mother' or 'Grandmother'. The cultural perspective of *mālama ʻāina* and *aloha ʻāina*, to care for the land and nature with sincere love and respect, is at the heart of Kanaka Maoli cultural traditions. For those who are listening, what is our *ʻāina* trying to tell us during these times of change?

Kanaka Maoli and their allies throughout Hawaiʻi and the world have risen like a mighty wave and are committed to protecting their beloved Mauna a Wākea from further desecration and destruction. May the following links to documented experiences from the Ala Hulu Kupuna to the summit assist all in understanding the Kanaka Maoli's deep connection to their sacred mountain.

[\*Like a Mighty Wave; Maunakea: Sacred Mountain, Sacred Conduct; We Are Mauna Kea; Sacred Mountain: Mauna Kea; Standing Above the Clouds; Mauna Kea – Temple Under Siege\*](#)



*Kū Kia‘i Mauna*

## APPENDIX A - SPECIFIC RECOMMENDATIONS

- 1) The proposed changes should be included in the Appendices instead of embedded within the narratives of the Supplement. For example, the section in 1.2 (UPDATE TO LOCATION AND DESCRIPTION OF UH MANAGEMENT AREAS) of the Supplement should be extracted and included in the Appendices as Section 3.1.1. Likewise, relevant sections and tables of chapters 3-14 of the Supplement should be renumbered and blended with some of the existing narratives in the 2009 CMP and then included in the appendices as Section 7.
- 2) Certain relevant and significant narratives of the 2009 CMP should be retained in the Supplement instead of purging this information.
- 3) CHAPTER 3 CULTURAL LANDSCAPE - this heading and all other references should be changed to **Cultural Resources**.
- 4) 3.4.1 CR-1: ENGAGE WITH CULTURAL COMMUNITY AND DEVELOP AND MAINTAIN APPROPRIATE GUIDANCE REGARDING CULTURAL ISSUES  
[As previously discussed, UH has drastically failed to engage and consult with Native Hawaiian stakeholders and the broader Hawaiian community as noted in the *Independent Evaluation* prepared for DLNR in 2020. How will BLNR/DLNR ensure that this will not continue in the future?]

The following should be revised/added as underlined:

To achieve this, UH will continue to work cooperatively with KKM, families with lineal/cultural/historic connections to Mauna Kea, Native Hawaiian cultural practitioners, hunters and resource gatherers, the Office of Hawaiian Affairs (OHA), and other Native Hawaiian groups and individuals. In carrying out this work:

Maintaining a CR-1 mailing list (with a preference for email communication) that includes individuals and families that self-identify as Native Hawaiian, including those that self-identify as having lineal/cultural/historic connections to Mauna Kea and/or as cultural practitioners, hunters and resource gatherers, OHA, and other Native Hawaiian groups and individuals. The CR-1 mailing list will be updated regularly.

Conducting meaningful community engagement and timely consultation with those on the CR-1 mailing list when other stakeholders associated with Mauna Kea are engaged in the review process of existing or new policies/plans.

5) 3.4.2 CR-2: SUPPORT APPLICATION FOR DESIGNATION OF SUMMIT AS TCP  
[Members of the public aren't able to comment on this section because the copy of the Supplement posted by DLNR is missing *Figure 3.1: Potential Traditional Cultural Properties in the UH Management Areas.*]

6) 3.4.5 CR-10: IMPLEMENT THE HISTORIC PROPERTY MONITORING PLAN  
[UH should consult with and include input from those on the CR-1 mailing list regarding the "still-to-be-acted-upon" recommendations from the archaeological monitoring reports for the identified SIHP sites listed.]

7) CHAPTER 9 INFRASTRUCTURE AND MAINTENANCE  
[IM-10 - All UH and astronomy facilities should be required to immediately start the process for removing existing cesspools and converting to zero-discharge wastewater systems instead of waiting until 2033.]

The component plans also identify areas where management needs overlap and management actions can be shared, while still accomplishing the desired outcome of each component plan. Cross-references are made to related component plans as needed.

## 7.1 Understanding and Protecting Mauna Kea's Cultural and Natural Resources

### 7.1.1 Native Hawaiian Cultural Resources

This section provides information and management actions to protect, preserve, and enhance the cultural resources of the UH Management Areas. As described in Section 5 cultural resources include historic properties and cultural practices and beliefs. Historic properties include archaeological sites and traditional cultural properties.

CMP management actions are based on a comprehensive archaeological survey and fieldwork of the UH Management Areas conducted between 2005 and 2008 and consultation with the major stakeholders, including the Native Hawaiian community, cultural practitioners, families with lineal connections to Mauna Kea, astronomers, and other interested parties. See Section 4.3.

#### *Desired Outcome*

Increase understanding and appreciation of Native Hawaiian history and cultural practices related to Mauna Kea to ensure that these practices are protected and respected. Identify, document the condition of, and protect cultural resources and historic properties in the UH Management Areas.

#### *Current Status*

A summary of the cultural resources found in the UH Management Areas is presented in Section 5.

Mauna Kea is a culturally significant site and is considered sacred by many Hawaiians. The summit region is designated as a historic district by the SHPD and is also eligible for listing on the National Register of Historic Places. In 2000, SHPD designated two areas within the UH Management Areas, Kūkahau'ula and Pu'u Līlinoe as TCPs. Some in the Hawaiian community have suggested that the entire area above 6,000 ft (1,829 m) should be designated a TCP. There are Native Hawaiians who continue to access the UH Management Areas to exercise traditional and customary practices, including the gathering of mamake, ko'oko'olau, and māmane, and others who access through the area for contemporary cultural practices and subsistence uses, burying the *piko* of their children, religious observances, scattering of ashes and visiting of *na iwi* kupuna. Mauna Kea continues to be a living resource.

Archaeological surveys and fieldwork identified and recorded 223 historic properties, of eleven types, within the UH Management Areas – including three, possibly four sites within the boundaries of the Astronomy Precinct – and one historic site complex at Hale Pōhaku (see Section 5.4).<sup>1</sup> All of the known historic properties and their locations in the UH Management Areas have been catalogued. This information will serve as baseline documentation against which any alteration or damage can be compared. The historic properties located within the 19.3-acre parcel at Hale Pōhaku have been mitigated through detailed site recording, collection of surface artifacts, and excavations. The road corridor under UH management has not been completely surveyed for culturally significant sites. No new sites were

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<sup>1</sup> The Astronomy Precinct is contained within the boundaries of the UH Management Areas and is further defined in Section 3.1.1. One of the sites is near a boundary line and without a surveyed boundary of the Astronomy Precinct, it is difficult to discern the exact location of the site relative to the boundary.

found in an archaeological survey of a 100-foot wide corridor on both sides of the road from Hale Pōhaku to the parking lot below Pu‘u Hau Kea (Williams 1987).

The archaeological survey and fieldwork for the UH Management Areas identified several confirmed burial sites, many other probable burials, and a large number of shrines.<sup>2</sup> How many of the burials and shrines are visited by family members is unknown, but family visitation is a cultural practice that must be protected and considered in the management of the UH Management Areas. Based upon the information gathered for the CMP, there are no known burials within the Astronomy Precinct. Treatment and disposition of previously identified Native Hawaiian burials are determined by the Hawai‘i Island Burial Council (HIBC). Chapter 6E-43.6 (HRS) and administrative rule 13-300-40 outline the procedures for dealing with inadvertently discovered human remains.

Tampering with ancient sites is prohibited under State historic preservation law. Chapter 6E, HRS, protects historic properties from alteration or destruction.

Access to areas on Mauna Kea and the right to engage in traditional and customary practices is not only accepted and supported, it is a right protected under the Hawai‘i constitution.<sup>3</sup> Traditional and customary cultural practices are taking place in the summit region as a whole, as well as at specific locations within the boundaries of the UH Management Areas (see Section 5).

Unrestricted access is one factor contributing to the degradation of cultural resources on Mauna Kea (see Section 6.3). It has been recognized that signage related to the protection of historical sites and appropriate cultural practices is needed (see Condition 13 of the 1995 *Revised Management Plan for the UH Management Areas on Mauna Kea* (DLNR 1995)). To date, these signs have not been placed.

One of the entities created by the 2000 Master Plan is Kahu Kū Mauna (Guardians of the Mountain). The nine member council advises MKMB, OMKM, and the UH-Hilo Chancellor on matters of Hawaiian culture affecting the UH Management Areas. The council comprises individuals from the Native Hawaiian community (see Section 3.3.1). Members of the council are consulted and their advice taken under strong advisement when uses or management actions are proposed for the UH Management Areas.

### **Need**

The cultural resources are subject to actual and potential degradation. Without planned protections and a commitment to implement plans, irreversible damage to Mauna Kea’s cultural resources is likely to continue. This CMP contains guidelines for long-term management of cultural resources and outlines a range of strategies and activities for their protection, identification, documentation, preservation, interpretation, and traditional use. The CMP also contains guidelines for consultation and education regarding cultural resources. These strategies reflect a series of general guidelines including:

- Recognizing that Mauna Kea is sacred to Native Hawaiians.
- Recognizing the need to continue consulting with the Native Hawaiian community, including cultural practitioners and families with lineal and historic connections to Mauna Kea, when formulating plans, protocols, and policies.
- Recognizing that cultural practices evolve over time and that management needs may change.

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<sup>2</sup> Known Native Hawaiian burials within the UH Management Areas are, according to State historic preservation law, termed “previously identified,” in that they have been recorded either through previous archaeological surveys or by other types of site visits, or through information provided by Native Hawaiian organizations to SHPD or the island burial council (cf. §6E-43.5(e)(2) and HAR §13-300-24(B)).

<sup>3</sup> Hawaii Revised Statutes, Sections 1-1 and 7-1, and Article XII, Section 7 of the Hawaii State Constitution protect traditional and customary practices, including gathering rights and access.

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- Ensuring a balanced approach between traditional customary practices related to cultural properties and the need to protect natural resources and historic properties.

A consistent theme of the CMP management component plans is that culturally sensitive and appropriate educational information is the most effective and efficient method of protecting cultural and natural resources. Visitors to Mauna Kea should be educated regarding the cultural landscape of Mauna Kea, including cultural practices, historic properties and their sensitivity to damage, and the rules and regulations regarding the protection of historic properties. For example, pointing out to visitors and cultural practitioners the impacts of leaving offerings will likely result in a reduction of this activity by those who are not engaging in it for religious practice or tradition. Section 7.1.3 describes educational and awareness needs and management actions in more detail.

Accurate and complete information is a critical component in management planning. Baseline documentation on all known historic properties within the UH Management Areas has been virtually completed. HAR §13-277-6 (8) requires monitoring of historic properties in order to ensure their long term preservation. A monitoring program for historic properties is needed to track changes over time, providing a valuable tool for resource protection.

Documenting and monitoring historic properties captures only part of the cultural history and resources related to Mauna Kea. Of equal importance is a need to recognize and document traditional and customary cultural practices. Culture is dynamic, and it is likely that new practices will evolve in the future. Efforts to compile information and conduct new cultural research about Mauna Kea, including more oral history documentation, must continue. This will ensure that such information is not lost, that the range of practices is captured as culture evolves, and that policies and procedures that are developed for resource protection do not impede traditional and customary practices. Some cultural practitioners may be reluctant or refuse to discuss their beliefs and practices, potentially limiting the ability to identify every single belief and practice and variations between practitioners.

It is imperative that the management plan not adversely affect the constitutionally protected right to access for the exercise of traditional and customary practices. In order to ensure this, it is important to identify the access needs for cultural, religious, and spiritual practices. As the advisory body on cultural matters, Kahu Kū Mauna or the Hawaiian Cultural Committee of the MKMB shall invite and consult with families with lineal and historic connections to Mauna Kea, *kūpuna*, cultural practitioners, the Office of Hawaiian Affairs and other Native Hawaiian groups on developing culturally appropriate protocols to ensure access for engaging in traditional and customary practices while minimizing adverse impacts to cultural and natural resources.

Like the protection of access to traditional and customary practices, protection and preservation of human burials and cultural resources will be paramount. Full compliance with the Burial Laws (HRS, Chapter 6E), including the preparation of a Burial Treatment Plan for the known and potential Native Hawaiian human burial remains, will be strictly adhered to. Future activities and uses within the UH Management Areas involving construction or other ground-disturbing work have the potential of encountering human burials. All applicable rules and regulations pertaining to “inadvertent discoveries” shall be followed (see Section 6.4). Procedures related to cultural resources should be clearly explained to any contractors and to all staff of OMKM and other University entities that participate in any future construction activities. It should be possible to preserve the historic properties in the Astronomy Precinct through avoidance and the establishment of buffers. Buffer zones around historic properties will help maintain their integrity. Monitoring during construction activities is addressed in Section 7.3.2.

Management plans are not static. To provide adequate protection of cultural resources, continual reevaluation of policies and procedures within organizations and coordination among agencies is

necessary. The University and all University organizations associated with Mauna Kea, such as OMKM and MKSS, must coordinate with DLNR, SHPD, and in some cases, the HIBC and local law enforcement, in order to successfully implement protective measures for the historical and cultural resources of the UH Management Areas. In addition, because the boundaries of the cultural landscape extend outside of the UH Management Areas, UH must work closely with DLNR to develop policies and implement procedures to monitor cultural resources. As the advisory body on cultural resources, Kahu Kū Mauna shall be consulted about all issues that may require their counsel.

Enforcement personnel such as rangers not only help deter actions that may damage cultural resources or that are illegal; they can also serve in an educational capacity. OMKM rangers currently maintain a presence on the mountain, but because they lack enforcement authority, they are limited in their effectiveness. The presence of enforcement personnel is critical to the protection of resources and to visitor safety (see Section 7.2.2). Rules must be established to protect and preserve the resources of Mauna Kea. Enforcement of rules is a critical element of future management.

A variety of federal and state laws cover the effects of proposed actions on historic properties and cultural practices (see Section 3.4). In general, it is likely that activities that do not require ground disturbance or alteration of existing environments may not require a permit. Conversely, in the Conservation District, research activities, construction, observatory-related projects, or any other project that may result in ground disturbance or impacts to historical sites or cultural practices, may require some type of permit. A sufficient number of enforcement personnel are necessary to ensure that rules and regulations are followed as directed by permits (see Section 7.2.2 and Section 7.4.1) or the CMP.

### *Management Actions*

The BLNR has previously identified management actions to address the needs described above.<sup>4</sup> This CMP adopts those management actions where appropriate as follows:

1. There shall continue to be an Office of Mauna Kea Management and a Mauna Kea Management Board, whose mission shall continue to be:

Achieve harmony, balance and trust in the sustainable management and stewardship of the Mauna Kea UH Management Areas through community involvement and programs that protect, preserve and enhance the natural, cultural and recreational resources of Mauna Kea while providing a world-class center dedicated to education, research and astronomy.

The Mauna Kea Management Board shall include, but not be limited to, a representative of the Department and Native Hawaiian interests, environmental interests, and the business community. The Office of Mauna Kea Management shall regularly consult with and seek advice from Native Hawaiians, Native Hawaiian organizations, and environmental organizations.

2. The Office of Mauna Kea Management shall oversee compliance with the permit and report any known or suspected non-compliance or violations to the Department.

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<sup>4</sup> BLNR previously imposed the following management actions when they granted the Outrigger Telescopes CDUP. The CDUP was subsequently reversed by Judge Hara. However, the BLNR's management actions are consistent and applicable to the CMP. Accordingly, the following conditions have been cited verbatim except where the reference was to the "Outrigger Telescopes permit" and has been replaced with the generic term "permit."

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3. On June 30 of each year, the Office of Mauna Kea Management shall submit to the Board of Land and Natural Resources a written report detailing its activities generally, and with particularity its activities with respect to its responsibilities under the permit.
4. All persons involved with construction activities, including, but not limited to, the construction manager, contractors, supervisors, and all construction workers, and all persons involved in operation and maintenance activities, including, but not limited to, scientists and support staff, shall be educated about the historical and cultural significance of the Mauna Kea summit area, and shall be given training as to what constitutes respectful and sensitive behavior while on the summit area. A detailed plan for complying with this condition (including both the content of training and the procedures for implementation, including, but not limited to, a means for certifying persons who have completed the training program) shall be developed by the Office of Mauna Kea Management following consultation with Kahu Kū Mauna or other Native Hawaiians or Native Hawaiian organizations known to have cultural ties to Mauna Kea, and reviewed and approved by the Department. A specialist or specialists in the field of Native Hawaiian culture shall be selected by the Office of Mauna Kea Management with the concurrence of the Department for the purpose of implementing the compliance plan, including, but not limited to, the conduct of educational and training programs for all persons described in this condition. To be qualified for appointment to this position(s), a person shall have worked as a Native Hawaiian cultural specialist and shall be knowledgeable of the types of cultural resources and practices relating to the summit of Mauna Kea. The criteria or qualifications for the cultural specialist shall be developed in consultation with Kahu Kū Mauna, in consultation with families with lineal and historic connections to Mauna Kea, *kūpuna*, cultural practitioners, the Office of Hawaiian Affairs, and other Native Hawaiian groups.
5. During all periods of construction (including, but not limited to, the delivery of construction materials to the site or to staging areas), there shall be on-site a construction monitor, whose responsibility shall be to monitor compliance with the terms and conditions of the permit as related to construction activities.

The on-site construction monitor shall have the authority to order that any or all construction activity must cease if and when, in the construction monitor's judgment, (a) there has been a violation of the permit that warrants cessation of construction activities, or (b) that continued construction activity will unduly harm cultural resources; provided that the construction monitor's order to cease construction activities shall be for a period not to exceed seventy-two (72) hours for each incident. All orders to cease construction issued by the construction monitor shall be immediately reported to the Chairperson and the Office of Mauna Kea Management. The Chairperson may issue a cease and desist order to extend the period of time that construction activity is prohibited, or such other order as the Chairperson deems appropriate.

The construction monitor shall be selected by the Office of Mauna Kea Management with the concurrence of the Department. The construction monitor shall have experience and be knowledgeable in construction management. Prior to assuming on-site duties, the construction monitor shall have completed the educational and training program above.

6. Whenever construction, operations or maintenance activities include earth movement or disturbance, a trained archaeologist, selected by the Office of Mauna Kea Management and approved by the Department, shall be on site to monitor any impacts, real or potential, of construction activity on archaeological and historical resources. The archaeological monitor shall be funded by the project.

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7. In addition to the statutory requirements of Hawai‘i Revised Statutes chapter 6E, if an inadvertent discovery of any human burial is discovered in the course of construction, operation or maintenance of the project, the person making the discovery shall seek the advice and recommendation of either the Hawaii Island Burial Council or Kahu Kū Mauna, recognized lineal or cultural descendant, for treatment of the inadvertently discovered burial.

Pursuant to the legal requirements under the Hawai‘i Supreme Court’s ruling in *Ka Pa‘akai*, access to UH Management Areas for Native Hawaiian traditional and customary practices shall not be restricted, except where safety, resource management, cultural appropriateness, and legal compliance considerations may require reasonable restrictions:

1. Access for traditional and customary practices, including the gathering of cultural resources, including but not limited to mamake, ko‘oko‘olau, māmane, ‘awa, and ōwī.
2. Access for families to visit *na iwi kupuna* (the bones of their ancestors).
3. Access to scatter ‘*ohana* ashes.
4. Access through the trails located within the UH Management Areas for subsistence gathering and hunting.
5. Access for families to continue to bury their ‘*ohana piko*.
6. Access for traditional and customary practices, including religious and spiritual observances, pilgrimage, offerings, and prayers.
7. Access for families to gather water from Lake Waiau for religious and spiritual purposes.
8. In the event of disputes or determination of appropriateness of traditional and customary practices, including cultural, historical, and natural resources, Kahu Kū Mauna and/or the MKMB Hawaiian Cultural Committee in consultation with families with lineal and historic connections to Mauna Kea, *kūpuna*, cultural practitioners, the Office of Hawaiian Affairs and other Native Hawaiian groups shall provide cultural guidance on the appropriateness of the practice and appropriate cultural protocols.

The following table lists additional management actions to address the needs described above. For items identified with an asterisk, additional considerations are described after the table.

**Table 7-1. Management Actions: Native Hawaiian Cultural Resources**

<b>Management Action</b>	
<b>Management</b>	
CR-1*	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, <i>kūpuna</i> , 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.
CR-2	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.
<b>Cultural Practices</b>	
CR-4*	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices.
CR-5*	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings

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<b>Management Action</b>	
CR-6*	Develop and adopt guidelines for the visitation and use of ancient shrines.
CR-7*	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.
CR-8*	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.
CR-9*	A management policy for the cultural 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.
<b>Historic Properties</b>	
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.
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.
CR-12*	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.
CR-13*	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB’s Hawaiian Culture Committee, the Hawai‘i Island Burial Council, the Office of Hawaiian Affairs, recognized lineal or cultural descendants, and SHPD.
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.

Additional Considerations for Management Actions

*CR-1. Appropriate procedures regarding cultural issues*

Culturally appropriate protocols developed in consultation with Kahu Kū Mauna, families with lineal and historic connections to Mauna Kea, cultural practitioners, *kūpuna*, the Office of Hawaiian Affairs and other Native Hawaiian individuals and organizations may describe culturally appropriate practices and what may be considered culturally disrespectful behaviors that should either be discouraged or, perhaps, banned altogether. Subject to compliance with the legal requirements for access to traditional and customary practices of the State Constitution, no restrictions shall be placed on any Native Hawaiian cultural observance except those observances that are considered culturally inappropriate by a collective consensus of Kahu Kū Mauna, the MKMB Hawaiian Culture Committee, families with lineal and historic connections to Mauna Kea, *kūpuna*, cultural practitioners, the Office of Hawaiian Affairs and other Native Hawaiian groups. Access shall not be denied or unduly restricted for Native Hawaiians wanting to visit sites such as burials or shrines or exercise their religious and spiritual practices within the UH Management Areas. Public tours of burial sites shall be prohibited. The rangers or other management staff shall be notified of visits to burial sites prior to the visits for security and safety reasons.

*CR-4. Collection of information on traditional and customary cultural practices*

Several methods may be used to establish a process for the ongoing collection of information on traditional and customary cultural practices and their significance. OMKM should partner with educational institutions such as the UH-Hilo and Hilo Community College, to establish an oral history program that would memorialize the traditional and customary practices associated with Mauna Kea. Native Hawaiian families or communities that have a connection to Mauna Kea shall be invited to work with OMKM to identify traditional and customary practices associated with Mauna Kea and ensure those practices are protected and respected (see Section 7.1.3).

*CR-5. Guidelines for the culturally appropriate removal of offerings*

One practice that has become a major management issue in many places in Hawai'i is the placement of offerings on altars. Offerings include both biodegradable items (e.g., leis and foods such as bananas) and a variety of other objects, including unmodified stones, artifacts, prayer flags, and crystals. Accumulations of offerings can have an adverse effect on the integrity of historic properties as well as on natural resources. In most cases, to protect resources, offerings must be removed; however, this process must be done in a culturally appropriate manner. Guidelines will include a stipulation that food offerings be removed immediately following the ceremony, and a means of handling non-food offerings during and after removal. Consultation with cultural practitioners is critical to the development of these guidelines. A culturally trained staff person or a specially designated individual shall be responsible for the removal of offerings.

*CR-6. Guidelines for the visitation and use of ancient shrines*

Guidelines for the visitation and use of ancient shrines are necessary to provide a mechanism that allows for access and use by modern cultural practitioners yet preserves their integrity and the underlying meaning they had for the ancestors that built them. Guidelines shall include the provision that access shall not be denied or unduly restricted for any Native Hawaiian wanting to visit the shrines within the UH Management Areas. No restrictions shall be placed on any observance or practice that is deemed culturally appropriate (see *CR-1 Appropriate procedures regarding cultural issues*), as long as the practice does not violate Chapter 6E, which prohibits the alteration of historic properties. Practitioners shall be informed of the same general rules and precautions as are all public users. A program to regularly monitor the condition of ancient shrines shall be established and if effects of heavy use become apparent, measures will be considered to control access (see CR-9, CR-13, and CR-14).

*CR-7. Determining the appropriateness of constructing new Hawaiian cultural features*

This is an extremely sensitive issue as most Native Hawaiians will be the first to say that it is not their *kuleana* to judge the cultural practices of another Hawaiian. However, the intent of this management measure is to develop a process to determine culturally appropriate protocols. Kahu Kū Mauna and/or the MKMB's Hawaiian Cultural Committee in consultation with families with lineal and historic connections to Mauna Kea, *kūpuna*, cultural practitioners, the Office of Hawaiian Affairs and other Native Hawaiian groups will work in collaboration to develop these protocols. Guidelines should be adopted to assist in formulating culturally appropriate protocols (e.g., to determine which kinds of features and locations are appropriate or inappropriate, as well as if and when a regulatory review process is necessary). Construction of new features will be evaluated to determine whether a CDUP is required. New construction not complying with the applicable protocols, the conditions imposed by guidance provided by Kahu Kū Mauna, MKMB, and/or the MKMB Hawaiian Cultural Committee or administrative rules, if/or when adopted, will be dismantled.

*CR-8. Management policy on the scattering of cremated human remains*

The scattering of the ashes of cremated human remains and the burial of urns in the summit area of Mauna Kea are on-going cultural practices. These private affairs are not well known or documented, but they may impact historic properties. One recommendation is to adopt a policy similar to that recently instituted at Hawai'i Volcanoes National Park, with the following considerations:

The scattering of cremated human remains requires a special use permit. A death certificate is required to obtain a special use permit. Conditions of the permit include: scattering must take place in a such a manner and in such a location that the ashes will not be located and identified as human remains; no memorials, plaques, photos or flowers may be left behind; the permittee recognizes and is aware of the sensitivity of this activity and agrees to perform it in a discrete and private manner; all local, state, and county rules and regulations must be followed; violation of

the terms and conditions of the permit may result in the immediate revocation of the permit and/or other law enforcement action.<sup>5</sup>

However the ultimate determination will be based upon appropriate cultural consultation and applicable rules.

*CR-9. Management policy on the piling and stacking of rocks*

*Ahu*, which are created by placing single rocks or stacks of rocks on boulders and outcrops, dot the landscape in the summit area of Mauna Kea. Most of the 336 “find spots” recorded in the 2005–2007 archaeological survey are piled and stacked rocks. Such features, which are widespread in Hawai‘i, may have as their basis a traditional cultural practice, but whose purpose and meaning have probably changed over time. At the same time, there is reason to believe that a large number of the single rock features and small concentrations of piled or stacked rocks on Mauna Kea are modern and that many were constructed by non-Hawaiian visitors in the last decade or so.

The management policy for piling and stacking rocks could be similar to that recently instituted at Hawai‘i Volcanoes National Park (Kubota 2005). A culturally trained staff person will be responsible for the culturally appropriate removal of rock piles that are made on Mauna Kea. Visitors to and users of Mauna Kea will be educated about the importance of preserving the cultural landscape, with particular attention to prohibitions on the piling and stacking of rocks.

*CR-10. Historic Property Monitoring Program*

A historic property monitoring program would provide a plan for monitoring the condition of identified historic properties within the UH Management Areas. The primary purpose of monitoring these sites is to determine what uses, if any, are affecting historic properties and the degree and frequency of these effects. This information would, in turn, help in developing ways to prevent or minimize the occurrence of damaging uses. The long-term effects of human activities and natural processes on historic properties shall be monitored and management policies adjusted, as needed. Inventories of areas that have not yet been surveyed, such as the road corridor, should be a priority. In addition, new discoveries and Hawaiian cultural features that are newly erected should be described and their locations recorded, so that they can be protected and monitored as part of this program. The recording and monitoring of new cultural features may depend on what guidelines or policies are adopted for new cultural features. While the recording of new features should be done, to continue the process of developing a baseline, the monitoring of all features, which already number over 300, would be an overwhelming and expensive task and would need to be sensitive to the desire of some Hawaiians to not have their features recorded. The findings of the historic property monitoring program will be used to inform management decision-making.

*CR-12. Establishing buffer zones around historic sites*

In order to protect all known historic sites within the Astronomy Precinct, a specified buffer shall be established around each site, if and when a specific set of development plans is proposed. OMKM and Kahu Kū Mauna will work with DLNR, including SHPD and appropriate divisions, on establishing buffers. Each buffer would vary in size based on the area of potential effect, which is defined as the geographic area or areas within which an action may affect historic properties. HAR §13-277-4 requires buffer zones to be established to ensure that the integrity and context of historic properties are preserved. Establishing and marking buffers with fences, the most common type of buffer, would draw attention to the sites, and is not recommended unless a site needs to be identified for a particular activity.

To mitigate potential visual impacts associated with buffers, their use will be limited to historic sites threatened by a specific activity. If the threat is temporary, such as nearby construction using heavy

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<sup>5</sup> Derived from <http://www.nps.gov/havo/parkmgmt/scattering-of-ashes.htm>

equipment, the buffer will be removed after the activity is complete. If the threat is permanent, such as from a hiking trail near a shrine, a permanent buffer will adhere to design standards similar to those for interpretive signage and blend with the natural landscape as well as any associated interpretive signage. Permanent buffers will be designed to achieve the desired protective effect with minimal introduction of foreign materials to the environment or alteration of the environment. Where appropriate, buffers will mark critical portions of the buffer zone rather than create a barrier to entry.

#### *CR-13. Burial Treatment Plan*

Components of the burial treatment plan should include documenting inadvertently exposed burials and reburial sites for inclusion in the historic property catalogue; appropriate treatment protocols for human remains exposed due to natural causes; and monitoring protocols for burial sites. The burial treatment plan must adhere to all state laws and shall be approved by SHPD in consultation with the HIBC and where appropriate, recognized lineal and cultural descendants, and Kahu Kū Mauna. Determinations on the treatment and disposition of inadvertent discoveries of human remains fall to the DLNR and SHPD, in consultation with the HIBC, the Office of Hawaiian Affairs, and any known descendants (cf. §6E-43.6, HRS, and HAR 13-300-40). Although circumstances for each inadvertent burial find may differ, the procedures specified in §6E-43.6(a) through (c) should always be followed. Depending on the results of consultation with Kahu Kū Mauna and other stakeholders, including the HIBC and any known descendants, treatment measures may also include the covering up or securing of any exposed skeletal remains.

### 7.1.2 Natural Resources

This section provides information and management recommendations to ensure the protection, preservation, and enhancement the natural resources of the UH Management Areas.

While past management planning for the Mauna Kea area has focused on development planning (i.e., *2000 Mauna Kea UH Management Areas Master Plan* (Group 70 International 2000)) and guiding uses of the area (i.e., *1995 Revised Management Plan for the UH Management Areas on Mauna Kea* (DLNR 1995), which focused on public access), the CMP addresses the protection and preservation of natural resources in the UH Management Areas. The CMP is based on a comprehensive review of existing scientific studies, biological and physical resource inventories, and historical documentation. The CMP also examines human uses of the area, with particular emphasis on their current and potential impacts on natural resources. The CMP was developed with the following concepts in mind:

1. The high-elevation areas of Mauna Kea represent a unique global resource that should be preserved for future generations.
2. Management activities shall be focused on limiting the impacts of human activities on natural resources.
3. The planning and execution of natural resources management programs will involve input from the larger community, including scientists, educators, volunteers, and the public—as well as from natural resource managers.
4. Long-term global environmental factors such as climate change must be taken into account when planning natural resource management activities.
5. Natural resources management planning will use an ecosystem approach.<sup>6</sup>

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<sup>6</sup> An ecosystem consists of the plants, animals, and microorganisms within an area; the environment that sustains them; and their interactions. Ecosystem can be as tiny as an isolated wetland containing only a few species or as huge as a tropical rainforest containing thousands of species.

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6. Adaptive management techniques will be used.
7. The biological and physical resources found in high elevation areas of Mauna Kea and the unique ecosystems that encompass them deserve further study by researchers and managers.

### *Desired Outcome*

Increase understanding of the status of natural resources (biotic and abiotic), and identify threats to these resources in order to better protect and preserve unique geological features, ecosystem functions, subalpine and alpine habitats, and biological communities through adaptive management of stressors and threats.

### *Current Status*

There are many unique geological features and biological communities within the UH Management Areas. The summit area consists of an alpine stone desert with scattered *pu'u* (cinder cones) that support a unique aeolian invertebrate community that includes the wēkiu bug. Below the summit lie the alpine grasslands and shrublands where the Mauna Kea silversword is found. Remnant subalpine māmane woodlands in the area of Hale Pōhaku support the Palila and other native birds, as well as unique insect communities. A review of the natural resources found in the UH Management Areas is presented in Section 5.2 of this CMP.

Threats to the natural resources found in the UH Management Areas are reviewed in Section 6.3. Not all of these threats are of the same magnitude, and not all threats are currently impacting resources on the mountain. For example, air pollution and noise pollution are currently considered to be minor threats in high-elevation areas on Mauna Kea. This may change with time, and so, for completeness, all known potential threats are addressed in the CMP. The threats to natural resources currently considered to be of the highest priority for management action include habitat alteration, invasive species, population decline, and climate change. Table 7-2 lists the sections in the CMP that address each threat.

**Table 7-2. Potential and Known Threats to Natural Resources in the UH Management Areas**

Resource	Threat	CMP Section
Habitat	Habitat alteration and loss	7.1.2
		7.1.3
		7.3.3
		7.3.4
Air	Air pollution	7.3.2
Water	Groundwater contamination	7.3.1
Soil	Soil contamination	7.3.1
	Erosion	7.3.1
	Solid Waste	7.3.1
Auditory Environment	Noise	7.3.2
Flora and Fauna	Invasive species	7.1.2
	Population decline and loss of diversity	7.1.2
	Scientific research and sample collection	7.2.1
	Fire	7.4.1
	Climate change	7.1.2
	Barriers to species migration	7.1.2

**Need**

Natural resources are subject to actual and potential degradation. Without planned protections and a commitment to implement plans, irreversible damage to Mauna Kea's natural resources is likely to continue. This CMP contains guidelines for the long-term management of natural resources and outlines a range of strategies and activities for their protection.

Sustainable management of the UH Management Areas should allow for multiple uses and activities including astronomy and other scientific research, education, recreation, and cultural practices. Sustainable management requires establishment of programs that protect, preserve, and enhance the natural resources of Mauna Kea. The following management measures are necessary to accomplish this goal:

- *Preservation of sensitive habitats and unique high-elevation ecosystems in UH Management Areas, including within the Astronomy Precinct.* One of the most efficient ways of preserving a sensitive ecosystem is to limit future development in the area. This objective has been met, to a large extent, by the establishment of the 525-acre Astronomy Precinct at the summit (Group 70 International 2000) as further defined in Section 3.1.1. Development is allowed only within the Astronomy Precinct and at Hale Pōhaku (19.3 acres). The 2000 Master Plan sets aside 10,760 acres for the preservation of natural and cultural resources. An additional measure of protection for sensitive habitats within the Astronomy Precinct can be achieved by prohibiting development of any currently undeveloped *pu'ū* at the summit.
- *Enhancement of existing native communities and unique habitats.* Enhancement refers to projects, programs, or management activities that contribute to the conservation of natural resources through such means as landscaping, establishing native gardens, and outplanting native species in sensitive habitats or in unique natural areas, to increase plant density and species diversity. Enhancement activities should be conducted primarily in high-use areas where native biological communities may have become degraded or disturbed.
- *Mitigation for planned damage to sensitive ecosystems.* Mitigation is the planned creation of new habitat or the restoration of existing habitat, to replace habitat that is destined to be destroyed or disturbed by development. All proposed new land uses (such as development) that will damage or permanently destroy sensitive habitats should address the need for mitigation and propose suitable mitigation activities.
- *Rehabilitation of damaged ecosystems.* Rehabilitation is the repair of habitat following an unplanned disturbance, such as a vehicle accident, hazardous materials spill, or erosion event. Rehabilitation emphasizes the repair of ecosystem processes, productivity, and services.<sup>7</sup> Rehabilitation differs from mitigation in that it occurs only as-needed and cannot necessarily be planned for.
- *Restoration of damaged ecosystems.* Ecosystem restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (Society for Ecological Restoration International Science & Policy Working Group 2004). The goal of ecosystem restoration is to return an ecosystem to its historic condition, including physical structure, soil development, hydrological processes, species composition, and biodiversity. Restoration can occur on a variety of scales, from a small, localized effort to a project encompassing an entire

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<sup>7</sup> Ecosystem services are the processes by which the environment produces resources that we rely on, such as clean water, timber, and pollination of native and agricultural plants. For more information, see the Ecological Society of America web site, <http://www.esa.org/ecoservices/comm/body.comm.fact.ecos.html>.

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mountaintop. In most cases, funding and time are the limiting factors preventing large-scale restoration. In addition to general ecosystem restoration, cinder habitat shall be restored following decommissioning of telescopes at the summit (see Section 7.3.3). Cinder habitat on summit *pu'u* shall be restored following the removal of telescopes and that this will be funded by the entity that controls the telescope.

Several federal and state laws apply to management and protection of natural resources (see Section 3.4). All management actions and activities must comply with these laws and regulations.

Enforcement personnel such as rangers are necessary to ensure that rules and regulations are followed as directed by law and permit requirements (see Section 7.2.2 and Section 7.4.1). OMKM rangers currently function in an interpretative capacity only, as they have no enforcement power. OMKM rangers help deter user actions that may damage resources or that are illegal, but they cannot issue citations or enforce regulations pending legislative enforcement authority. It is recommended that rangers be deputized, so that they can more effectively protect the natural resources in the UH Management Areas. This is discussed in more detail in Section 7.2.2.

OMKM is the entity designated in this CMP with responsibility for monitoring tenant observatories for compliance with the conditions of their CDUPs (see Section 7.2.2), and twice a year, rangers shall conduct compliance inspections at each observatory, to verify that the provisions of its CDUP are being met. Continued inspections are necessary to ensure that environmental safeguards are implemented.

Natural resource management activities and policy development should be conducted so as to protect the rights of Native Hawaiian cultural practitioners. This may mean allowing access, as needed, to otherwise closed sensitive areas for specific cultural uses. Consultation with Kahu Kū Mauna on cultural issues related to site access and permitted activities shall continue.

### ***Management Actions***

The BLNR has previously identified management actions to address the needs described above.<sup>8</sup> This CMP adopts those management actions where appropriate as follows

1. All persons involved with construction activities, including, but not limited to, the construction manager, contractors, supervisors, and all construction workers, and all persons involved in the operation and maintenance activities, including but not limited to, scientists and support staff, shall be educated about the environment, ecology and natural resources of the Mauna Kea summit area, and shall be given training as to what constitutes appropriate behavior while on the summit area for the protection for the natural resources. A detailed plan for complying with this condition (including both the content of training and the procedures for implementation including, but not limited to, a means for certifying persons who have completed the training program) shall be developed by the Office of Mauna Kea Management following consultation with scientist and environmental organizations knowledgeable about the Mauna Kea summit area, and reviewed and approved by DLNR.
2. Prior to entry into the Mauna Kea UH Management Areas, all construction materials, equipment, crates, and containers carrying materials and equipment shall be inspected by a trained biologist, selected by the Office of Mauna Kea Management and approved by the DLNR, who shall certify that all materials, equipment, and containers are free of any and all flora and fauna that may potentially have an impact on the Mauna Kea summit ecosystem.

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<sup>8</sup> See footnote 4.

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3. Whenever construction activities include earth movement or disturbance, a trained entomologist, selected by the Office of Mauna Kea Management and approved by the DLNR, shall be on site to monitor any impacts, real or potential, of construction activity on the wēkiu bug.

The following table lists management actions to address the needs discussed above. For items identified with an asterisk, additional considerations are described after the table.

**Table 7-3. Management Actions: Natural Resources**

Management Action	
<b>Threat Prevention and Control<sup>9</sup></b>	
NR-1*	Limit threats to natural resources through management of permitted activities and uses.
NR-2*	Limit damage caused by invasive species through creation of an invasive species prevention and control program.
NR-3*	Maintain native plant and animal populations and biological diversity.
NR-4*	Minimize barriers to species migration, to help maintain populations and protect ecosystem processes and development.
NR-5*	Manage ecosystems to allow for response to climate change.
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.
<b>Ecosystem Protection, Enhancement, and Restoration</b>	
NR-7*	Delineate areas of high native diversity, unique communities, or unique geological features within the Astronomy Precinct and at Hale Pōhaku and consider protection from development.
NR-8	Consider fencing areas of high native biodiversity or populations of endangered species to keep out feral ungulates (applies to areas below 12,800 ft elevation).
NR-9*	Increase native plant density and diversity through an outplanting program.
NR-10*	Incorporate mitigation plans into project planning and conduct mitigation following new development.
NR-11*	Conduct habitat rehabilitation projects following unplanned disturbances.
NR-12*	Create restoration plans and conduct habitat restoration activities, as needed.
<b>Program Management</b>	
NR-13*	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.
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.
<b>Inventory, Monitoring and Research</b>	
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.
NR-16*	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.
NR-17	Conduct research to fill knowledge gaps that cannot be addressed through inventory and monitoring.
NR-18	Develop geo-spatial database of all known natural resources and their locations in the UH Management Areas that can serve as baseline documentation against change and provide information essential for decision-making.

Additional Considerations for Management Actions

*NR-1. Limit threats to natural resources through management of permitted activities and uses*  
 Management of uses and activities is discussed in Section 7.2.1.

<sup>9</sup> See Table 7-2 for sections in the CMP that discuss management actions to prevent and control threats not addressed here. These include habitat alteration, air pollution, contamination of groundwater and soil, erosion, solid waste, noise pollution, scientific research and sample collection, and fire.

*NR-2. Limiting damage caused by invasive species*

Management tools to deal with invasive species include preventing new species from becoming established and controlling established species. Monitoring is a necessary component of both these tools. Prevention and control measures for invasive species to consider include

- Work with neighboring land managers to control invasive plants and animals that occur near property borders.
- Remove or control populations of invasive species at the developed areas of Hale Pōhaku and along Summit Access Road, to prevent spread into the UH Management Areas.
- Remove any species or individuals that appear to have been intentionally introduced to the UH Management Areas. Report any observation of intentional introductions to USDA Animal and Plant Health Inspection Service and DLNR.
- Request that everyone who comes up the mountain brush down their clothes and shoes to remove invasive plant seeds and invertebrates (see Section 7.1.3).
- Require wash-down of all construction vehicles and heavy equipment before they enter Hale Pōhaku or the UH Management Areas (see Section 7.3.2).
- Evaluate installation of a vehicle wash-station, to remove invasive plant seeds and invertebrates from vehicles.

*NR-3. Minimizing population decline and loss of native biodiversity*

The goal of maintaining native plant and animal populations and biological diversity in the UH Management Areas can be accomplished through the following objectives: 1) minimizing human-induced population declines or loss of biodiversity; 2) detecting changes in population size of rare or protected native species; 3) determining causes of population declines; and 4) restoring declining populations through adaptive management. Causes of population declines may include invasive species, habitat alteration, hunting and sample collection, wildfires, pollution, loss of pollinators and seed dispersers, genetic bottlenecks (inbreeding depression), small population size, and climate change.

*NR-4. Minimizing barriers to species migration*

Barriers to migration may include habitat alteration through development, the presence of invasive species, low dispersal rates or small population sizes of the migrating species, and missing species in the new habitat, such as prey items or symbiotic species. For example, if development is blocking the movement of a native plant species, a potential management action would be to conduct outplanting and restoration projects on the other side of the development (downslope, if species are moving to lower elevations, or upslope, if species are moving to higher elevations).

*NR-5. Addressing climate change*

Detecting the impacts of climate change will require monitoring of changes in climate and natural resource abundance and distribution. Monitoring climate change is a global, collaborative effort to which the University could contribute by collecting weather data at Hale Pōhaku and in the UH Management Areas and providing it as a public resource for use in climate change modeling and other studies.

The goal of managing ecosystems to allow for response to climate change can be accomplished through 1) detecting the impacts of climate change through long-term monitoring; 2) understanding the impacts of climate change on natural resources; 3) aiding or supplementing natural migration of communities using adaptive management (see NR-11); and 4) collaborating with other landowners and managers on Mauna Kea.

*NR-7. Delineating areas for protection*

Areas considered for protection may include

- Cultural and historical resources
- Unique geological features ((Lockwood 2000)
  - Undeveloped *pu'u*
  - Glacial features (high standing rock outcrops)
  - Sub-glacial lava-ice contact features
- Habitat for important, rare, threatened, or endangered native species, including
  - Wēkiu bug
  - Mauna Kea silversword
  - Palila
  - Hawaiian hoary bat
  - Māmane trees

*NR-8. Fencing plan to control feral ungulates*

Non-native feral ungulates feed on the native flora and fauna in the UH Management Areas. Fencing areas of high native biodiversity or populations of endangered species in areas below the 12,800 foot elevation will help protect natural resources from feeding activity. A fencing plan will identify priority areas for fencing protection when funds become available, and should consider whether a CDUP or other approval is necessary before fences can be constructed.

*NR-9. Increasing native plant density and diversity through an outplanting program*

Native plant density and diversity can be increased by planting greenhouse- or field-grown plants in sensitive or unique habitats, using native plants in landscaping at Hale Pōhaku, and by creating educational native gardens. The native gardens will also help educate the public by providing living examples of unique and rare plant species found in the area. Only plants grown from locally obtained seeds or stock should be used. All plantings must be first cleared through DLNR.

*NR-10. Mitigation planning*

All future development in the UH Management Areas should include mitigation plans for preventing or repairing damage to sensitive habitats caused by construction and development activities. Any habitat that will be permanently removed should be replaced on at least a one-to-one basis, through either creation of new habitat, restoration of degraded existing habitat, or by permanent protection of similar unique habitats.<sup>10</sup> Mitigation plans should be paid for and prepared by the project proposer, but should be reviewed and approved by the University and DLNR. If the disturbed habitat contains protected species or other critical habitats, mitigation plans may also have to be approved by state and federal agencies. Mitigation projects should include a minimum of two to five years follow-up monitoring, to assess the results of the project. The length of time that monitoring must occur will depend on the scale of the project and the organisms for which the habitat is being mitigated. Mitigation projects on the summit should focus on creation of new wēkiu bug habitat. Mitigation projects conducted at Hale Pōhaku should focus on restoration or enhancement of existing māmane woodlands.

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<sup>10</sup> Mitigation projects that result from a planned impact to critical habitat or threatened or endangered species will have different requirements, which will be determined by the USFWS. The ratio of disturbed to restored land in mitigation projects required by the USFWS depends on a number of factors, including the quality of the habitat destroyed, the type of habitat destroyed, and the quality of the restored habitat. Hale Pōhaku lies within Palila critical habitat.

*NR-11. Habitat rehabilitation*

Rehabilitation activities should be conducted when unintentional damage occurs. If desired, habitat can be restored rather than rehabilitated. Examples of rehabilitation projects include cleanup of contaminant spills, roadside repair projects following vehicle accidents, and erosion repair projects.

*NR-12. Restoration*

The goal of restoring damaged ecosystems can be achieved through the following objectives: 1) creating restoration plans, 2) conducting restoration activities, and 3) monitoring and maintaining restoration projects. Examples of restoration projects to conduct in the UH Management Areas include: restoration of wēkiu bug habitat in disturbed areas (e.g., near trails and existing observatory facilities); roadside restoration projects; silversword restoration projects; māmane woodland restoration through fencing, invasive species control, and out-planting; and habitat restoration following observatory decommissioning (see Section 7.3.3).

It is recommended that plans be coordinated with other agencies. Many of these agencies have existing restoration programs or projects that might be expanded to include UH Management Areas, provide assistance or funding, or provide guidance and techniques for restoration planning.

*NR-13. Increasing collaboration and cooperation between OMKM and state and federal agencies*

Currently there is no mechanism for integrated or coordinated management of Mauna Kea's natural resources, including lands outside of the UH Management Areas. No regular meetings are held between the governmental agencies with management responsibilities for Mauna Kea. Increasing communication between the stakeholders on the mountain and identification of opportunities for collaboration can be achieved in part through the development of an interagency working group involving all entities that are responsible for, or involved in, natural resource management in high elevation areas (above 6,200 ft, or 1,900 m)<sup>11</sup> on Mauna Kea, including the University, state and federal agencies, non-profit organizations, and other agencies and persons involved in the day-to-day management of Mauna Kea lands.

*NR-16. Conducting regular, long-term monitoring*

The results from monitoring and research programs should be used to adjust management policies, as needed, to better manage the resources (adaptive management). Long-term monitoring should include monitoring of enhancement, mitigation, and restoration projects to determine whether projects have been successful and to provide guidance for future management activities.

### 7.1.3 Education and Outreach

The purpose of this section is to provide information and management recommendations to improve upon its education and outreach efforts. Education includes providing information about natural, cultural, and astronomical resources to the public, through on-site and off-site materials and programs. Outreach includes activities to increase public participation in the stewardship of Mauna Kea, through community consultation and community involvement in resource management activities, through volunteer based programs.

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<sup>11</sup> For simplicity's sake, the working group, at least in the beginning, should focus on the high elevation areas. The cutoff (6,200 ft) was chosen because it is recognized as the boundary above which subalpine vegetation begins on Mauna Kea (Mueller-Dombois and Fosberg 1998). However, the working group may decide to change the area covered once it convenes.

## 4. COMMUNITY ENGAGEMENT PROCESS

This section describes the extensive community engagement process that was undertaken to involve the community throughout the development of the CMP. It also explains the consultation principles, based upon fundamental Hawaiian cultural values, which were used to engage the public in the development of the CMP.

### 4.1 Basis for Consultation

Clearly, many in the community believe the basis for the preparation of the CMP for the UH Management Areas stems, in large part, on the ruling by Judge Hara in January 2007. In the face of this decision, the University recognized the necessity to “step back” and re-evaluate its perspectives on management of Mauna Kea, as well as the circumstances and history that led them to the present state. This self-assessment revealed shortcomings in past planning and management efforts and underscored the need to address them during the CMP process.

During the recent Outrigger Telescope permitting process, many in the Hawaiian community experienced frustration as they attempted to express their perspectives and suffered psychological and spiritual hurt as their values and traditions were not given the attention and respect they deserved. As a result, they lost trust in the University as a responsible steward of the UH Management Areas and criticized the University for circumventing its own management policies. Subsequently, many individuals dissociated themselves from the process or resorted to other venues to express their views and advocate their position.

The University acknowledges these feelings and frustrations, and recognizes that a process of meaningful engagement and dialogue is necessary. The challenge in the CMP process has been to re-engage the individuals who lost confidence and trust in the University, to participate in a consultation process that will have far reaching effects to the entire community.

### 4.2 Consultation Principles

The consultation process is intended to be not only responsive to community involvement, but also attempts to establish a meaningful relationship between the University and the community. As with any relationship, shared commitments and values are central to its health and longevity. The University implemented its community consultation process grounded in several principles that are intended to be the foundation for sustaining a long term relationship with the community. These principles, common in most cultures, are especially important in a Hawaiian context.

**Purposeful or *Mākia*** – The time and attention of the community is very important. The University recognizes that community consultation must be mindful in order to be meaningful. The basis for consultation and dialogue with the community is to listen, discuss, understand and identify appropriate management strategies for the UH Management Areas.

**Respectful or *Mahalo*** – The University acknowledges the importance of a genuine dialogue with the community, and recognizes that past efforts and interaction with the community may not have attained this level of respect. The importance of “asking for permission” before acting and being grateful for the opportunity to discuss issues cannot be overstated.

**Humility or *Ha’aha’a*** – The University further acknowledges that in the development of previous plans for Mauna Kea many in the Hawaiian community were hurt by the lack of sensitivity, awareness, and

understanding. The University further recognizes that future management cannot be successful without first seeking to heal these pains. “Listening” with attention, respect, and compassion is very important.

**Trust or *Hilina‘i*** – As with any relationship, trust is fundamental. The University recognizes and commits to being truthful, open, and honest in the development of the CMP even if it meant that not everyone’s viewpoint or recommendation would be incorporated into the CMP although we thoughtfully listened to what everyone had to say.

**Thoughtful or *No‘ono‘o*** – As with any management plan, words must be translated into action. It is therefore essential and critical that the CMP be prepared in a way that best reflects the spirit and interests of the community, notwithstanding that members of the community may have differing perspectives.

**Consistency or *Pono*** – The University understands that when the CMP is implemented, it is especially important that its actions are consistent with the contents of the plan. Doing so not only validates the content of the plan, but also reinforces the input provided by those who contributed to its preparation and strengthens the relationships that were formed during the process.

**Continuity or *Ho‘omau*** – The University recognizes that community consultation is not a limited process for a specific issue. Successful management and stewardship are contingent upon long term relationships based on mutual trust and understanding. These relationships must be continually fostered and maintained to sustain the resources.

**Responsibility or *Kuleana*** – Responsibility is reciprocal for both the University and the community. The University commits to being a responsible steward of Mauna Kea’s cultural and natural resources. Similarly, the community must commit to working in partnership with the University to manage the resources so that they may be sustained for future generations.

### 4.3 Consulted Parties and Stakeholders

The mere presence and visibility of Mauna Kea suggests that anyone who can see the summit or who has heard of it may have a view or opinion as to its management. There are also a number of families, organizations and agencies who have an active (and in some cases, genealogical) relationship to Mauna Kea. The views of the general public are important and have been given due consideration in the development of the CMP. However, there are certain stakeholders whose views and perspectives were given careful consideration because of their cultural, legal, or political affiliation with Mauna Kea. They include the following:

**Kahu Kū Mauna** (Guardians of the Mountain) was established as an advisory body to the OMKM, MKMB and UH-Hilo specifically on cultural issues.

**Families** with lineal or historic relationship to Mauna Kea either through their genealogy, burials, or children’s *piko*.

**Hawaiian Cultural Practitioners** include those who access the UH Management Areas for religious and spiritual purposes and/or cultural ceremonies for the observance of events.

**Natural Resource Scientists** who are studying the physical and biological elements for the purposes of science and protection of the unique natural environment found within the UH Management Areas.

**Astronomical Community** are the scientists, engineers, technicians, and workers who access the UH Management Areas to either maintain the telescopes and their associated facilities or who gather and use the data.

**Hunters and Resource Gatherers** are individuals, families, and organizations that access the UH Management Areas to hunt and gather materials for cultural and subsistence purposes.

**Archaeologists and Historic Preservationists** who study and seek to preserve the oral history, physical structures, and cultural stories associated with past uses of Mauna Kea.

**Government Agencies** (federal, state, and local) who either have regulatory oversight of activities of the resources or who are in a contractual relationship (i.e., lease agreement) for the use of the UH Management Areas.

**Elected Officials** who serve the island of Hawai‘i at the county, state and federal levels.

**Office of Hawaiian Affairs** which works towards the betterment of Native Hawaiians.

#### **4.4 Consultation Process and Methods**

The University’s sought to re-establish a meaningful community relationship with the general public and particularly with the range of stakeholders involved with the UH Management Areas. To achieve this goal, a multi-faceted consultation process was undertaken. A deliberate attempt was made by the University to initiate the request with various stakeholders to “listen” to them in a setting or forum of their choosing. The following is a brief description of the approaches that were engaged in to reach out to the community and some of the results of that engagement:

**Individual and Small Talk Story Sessions.** For many Hawaiians who previously dissociated themselves from community dialogues, requests were made to meet them in informal, one-on-one meetings. Similarly, elected officials and government agencies were given individualized briefings. For various Hawaiian families, cultural practitioners and resource gatherers, requests were made for smaller talk-story sessions where the discussion could be confidential and respectful. In each of these meetings, not only did the University seek to listen and hear the issues raised, but it also provided information regarding Mauna Kea, the CMP, and its intentions for better management of the UH Management Areas. Since the start of the CMP process in the fall of 2007, the University or its representatives<sup>1</sup> requested and held over 150 individualized or small group meetings. Appendix A1 is a list of all the individuals and groups that we met with throughout the CMP process.

**Traditional Public Meetings.** In an effort to reach out to the broader Hawai‘i Island community, two rounds of public meetings were held in Hilo, Kona, and Waimea. The first round of meetings was held from May 6-13, 2008 primarily to inform the community about the CMP process and to listen to its concerns and issues regarding Mauna Kea. The second round of meetings was held from November 14-18, 2008 to follow-up with the community and provide information on the management concepts that were being developed based in part on their concerns and issues. Appendix A2 contains the announcements and attendance sheets. Two presentations were made to BLNR at its duly noticed public meeting (April 11, 2008 and October 10, 2008). A presentation was also made before the Office of Hawaiian Affairs Beneficiary Advocacy and Empowerment Committee (July 23, 2008) and OHA’s Native Hawaiian Historic Preservation Council (June 30, 2008 and December 15, 2008).

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<sup>1</sup> The University retained the services of a consultant team to develop the CMP. The consultant team initiated and represented the University in the community consultation process.

**Statewide Survey.** To independently gauge the community's understanding of Mauna Kea, the cultural, environmental and scientific issues related to Mauna Kea, a statewide telephone survey was conducted in March 2008. In total, 635 telephone interviews were conducted on Kaua'i (100), O'ahu (150), Maui (111), and Hawai'i (135 in Kona and 139 in Hilo). Of the total, 164 respondents self identified as Native Hawaiian. The results of this survey are contained in Appendix A3.

**Establishment of a Website.** The University sponsored the creation of a website in late 2007 to reach any interested person who had internet access. Not only does the website, [www.maunakeacmp.com](http://www.maunakeacmp.com), provide information about Mauna Kea, the CMP process, and links to various documents, it also allows users to submit their questions, comments, and concerns electronically. The website also provides the email address, mailing address, and fax number for persons interested in submitting written comments. Appendix A4 is a copy of the information posted on the website.

**Media Coverage.** During the CMP development process questions were raised by the Hawai'i Island and major daily print media about the CMP, its role in management, and the preparation process. Consistent information was provided to the media through the assemblage of media kits that contained a fact sheet and other relevant background material. Additionally, the University sought to meet with the editorial boards for the major daily and the Hawai'i Island newspapers to provide them with similar information and respond to their questions. Appendix A5 is a sampling of the media coverage.

**Mauna Kea CMP Newsletter.** In a further attempt to keep the community informed on the status of the CMP process as well as the results of what was heard in the community through outreach efforts, a newsletter was posted on the website and mailed to those who participated in the public community outreach process. Appendix A6 is a copy of the newsletter.

**Kūpuna Workshops on Astronomy.** Pursuant to a desire by the community, and in particular Auntie Mabel Tolentino, a Waimea Kupuna who wanted to have a better understanding about astronomy, several of the observatories and Kahu Kū Mauna collaborated in convening a series of workshops entitled, *Sharing Astronomy with Kupuna*. Appendix A7 is a copy of the workshop flyer and schedule.

**Outreach to Engage the Plaintiffs in the Outrigger Telescopes Lawsuit.** The University recognized that the Plaintiffs involved in the Outrigger Telescopes' lawsuit, which formed the basis for Judge Hara's 2007 ruling, represented an important stakeholder interest group. As such the Plaintiffs were proactively contacted through their legal counsel on at least two separate occasions to seek their participation in the CMP process. Appendix A8 contains the two letters that were sent to the Plaintiffs' attorneys. The Plaintiffs felt it inappropriate to participate in the CMP process because at that time the University was appealing Judge Hara's decision. At a later date, the University withdrew its appeal of Judge Hara's decision.

**Institute for Astronomy's Plans to Remove and Decommission Obsolete Telescopes.** During the community engagement process a recurrent theme heard from both Hawaiian and non-Hawaiians was that since the summit of Mauna Kea is so culturally significant, the community would like to see a specific plan that shows the removal of obsolete telescopes from the summit and decommissioning plans for each of the observatories, including restoration plans. Appendix A9 contains a series of related communications including: a letter to IfA requesting this information; IfA's letter dated July 15, 2008 proposing a Revised Plan for the Mauna Kea Observatories; the letters IfA sent to each of the observatories regarding their decommissioning plans; and responses from each of the observatories acknowledging their responsibilities for removal and restoration as provided under their sublease with the University.

**Association of Hawaiian Civic Clubs Resolutions.** Pursuant to a request from the Big Island Hawaiian Civic Club, the Association of Hawaiian Civic Clubs (AHCC) took formal action at their annual convention to adopt a resolution, “that it strongly urges the State of Hawai‘i Board of Land and Natural Resources, approve a Comprehensive Management Plan covering the lands leased to the University of Hawai‘i on Maunakea Mountain.” The AHCC passed another resolution urging the legislature to authorize OMKM to develop administrative rules for Mauna Kea. Appendix A10 is a copy of the Resolutions.

#### **4.5 Comment Review and Issue Formulation**

During the course of listening to stakeholders and the Hawai‘i community throughout the CMP development process, a broad range of concerns and issues were put forth. Included among them were statements regarding religious and spiritual beliefs, cultural practices, cultural and natural resources, legal matters, education, economic development, social justice, land use, management, and communication. Given the diversity of comments received, an effort was made to identify recurrent issues or concerns that would foster the formulation of the CMP management recommendations. Issues were evaluated in the context of the CMP scope, the current lease between the University and DLNR, existing statutes and rules, and other similar parameters regarding the University’s use and stewardship of the UH Management Areas. Comments were received from some individuals who believe that all astronomy on Mauna Kea should be halted, all telescopes removed, and that Mauna Kea should be restored and preserved solely for cultural and religious purposes. While such perspectives are understandable, they were not consistently held across the community; in fact, they were put forth by relatively few individuals.

One of the most consistent viewpoints was that science (astronomy) can co-exist within the cultural and natural resource setting of the UH Management Areas. This perspective was held across nearly all groupings and individuals ranging from families that have a lineal or a historic connection to Mauna Kea to individuals who reside on neighbor islands. Beyond this generally held belief however, perspectives varied with regard to how such uses should occur and be managed and it is from these viewpoints that the management actions, detailed in Section 7 were established.

#### **4.6 Framing the Management Concepts**

Based on a review of the community input, several trends emerged that allowed for the framing of distinct management concepts. These concepts were used as precursors or guides in the development of the specific management actions detailed in Section 7.

*The cultural integrity and significance of Mauna Kea must be preserved*

Many individuals, Hawaiian and non-Hawaiian, believe that the CMP and the University’s management of their lands on Mauna Kea must be grounded in Native Hawaiian understanding and values. From this point, a range of concepts were suggested as to how culture can be preserved and integrated as part of the CMP management framework. For example, suggestions arose not only for an orientation for persons accessing the UH Management Areas, but also for a substantial educational outreach component that would bring the culture and science from Mauna Kea to classrooms or other forums.

*Multiple uses and activities must be managed*

The UH Management Areas are currently accessed for cultural and religious purposes, astronomy, subsistence hunting and gathering, archaeology, scientific research, and sightseeing and recreation. It is clear to the community that improved management is necessary. Some suggestions for improvement were

aimed at the people accessing the area and included: access control procedures, signage, improved education, and orientation.

*Development within the Astronomy Precinct must be controlled*

One of the more consistent comments from the community was that additional controls were necessary for astronomy-related development in the summit region. The community approached this issue from several viewpoints. Many believe that the 13 existing facilities are too many and disapprove of adding more. Others believe that some of the existing telescopes must be decommissioned before any new telescope is constructed. The basis for this was not only to preserve a “zero net gain” of telescopes, but also because of the recognition that decommissioning is perhaps the most tangible form of actually listening to the community’s concerns that before new telescopes can be considered some obsolete facilities must come down.<sup>2</sup> Some individuals focused on the telescopes themselves and held that should a new telescope be constructed on Mauna Kea, it should be the best in the world not only for scientific purposes, but also reflect the Hawaiian commitment to excellence – *kūlia i ka nu‘u*.

Other commenters applied a land use planning approach and identified specific areas within the summit region that should be preserved and not used for telescope development because of the presence of *‘iwi kupuna*, cultural sites, and use for ceremonial purposes. While others focused on site restoration, remediation of environmental contaminants, and management of hazardous substances.

*The University must restore its trust and confidence with the community.*

One of the broader issues that emerged from the community consultation was that many Native Hawaiians continue to feel emotional pain and distrust of the University and its management of UH Management Areas. Reconciliation and re-establishment of confidence in the University is difficult to convey solely through a document such as the CMP, but must occur through action and implementation. The community was clear in its desire to be consulted on a regular basis and to be actively involved in the management decision-making process.

The community also holds the University, including UH-Hilo, IfA, OMKM, the MKMB and others accountable, to be consistent and coordinated in implementing the CMP. More specifically, that plans and policies not be circumvented and that the lines of communication and coordination are well maintained between all the University entities. The community further expects transparency from these entities as management decisions are contemplated and agreed upon.

The community also expressed the view that the amount of resources (funding, staffing, facilities, and equipment) and legal authority to manage the UH Management Areas is insufficient. This view was expressed particularly with regard to OMKM Rangers and their lack of ability to enforce rules governing use and access within the UH Management Areas.

#### **4.7 Commitment to Consultation**

Using the management concepts identified above, the specific management actions detailed in Section 7 were assembled. In the spirit and intent to maintain a continued consultation, the draft CMP management actions were presented and discussed with the community in October and November 2008.

These meetings, referenced in Section 4.3, were similar to the first round of meetings insofar as individual stakeholders were contacted for one-on-one or small group meetings, and publicly-noticed community meetings were held in Hilo, Kona and Waimea. During this process, the draft CMP management actions

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<sup>2</sup> Although issues related to future astronomical developments and decommissioning were a recurring theme in the community outreach project, these issues are beyond the scope of the CMP but have been identified in Section 2.1.4 as policy issues.

## Mauna Kea Comprehensive Management Plan

were validated by many stakeholders and community members as having addressed a number of their initial concerns, particularly with regard to ensuring that cultural values, practices, and access are preserved.

However, despite the cautious optimism expressed, stakeholders continued to express frustrations that the CMP management actions do not go far enough to ensure compliance and commitment by the University to the policies it previously established. As noted above, however, the true test of the effectiveness of the CMP will lie with its implementation and the extent to which the University and its subsidiary agencies can continue to embrace the values outlined in Section 4.2.

## Appendix B. Summary of Outreach and Consultation

CMS sought and benefitted greatly from the input of many stakeholders in the preparation of preliminary and final draft versions of sections of the Draft Outcome Analysis Report that was published on April 30, 2021. Their participation typically included such things as: (i) reviewing and commenting on preliminary draft versions of portions or all the document and/or (ii) meeting with UH representatives to discuss elements of the report. Those that were contacted and/or participated are summarized in Table B-1.

**Table B-1: Stakeholder Outreach for Draft OAR**

UH System	Meeting Occurred and/or Comments Received
Regent Alapaki Nahale-a	
David Lassner, President	
Michael Bruno, Provost	
Vassilis Syrmos, VP	
Hawai‘inuiākea School of Hawaiian Knowledge, Dr. Jonathan Osorio	
UH School of Ocean & Earth Science & Technology, Dr. Donald Thomas	
UH School of Travel Industry Management, Dr. Daniel Spencer	
UHH Chancellor	
UHH Chancellor’s Maunakea Advisory Committee	
Hanakahi Council	
Member of UHH Physics & Astronomy Dept.	
Native Hawaiian Affairs Program Officer	
Pūko‘a Council	
‘Imiloa	
CMS Team	•
MKMB	•
KKM	•
Environment Committee	•
<b>Astronomy Organizations</b>	
IfA	
UHH Hōkū Ke‘a	
CFHT	•
Keck	
UKIRT	
IRTF	
Subaru	
Gemini	
VLBA	
JCMT	

SMA	
TMT	
AURA	
<b>Federal Agencies</b>	
Army PTA	
Hakalau Forest, USFWS	
US Forest Service, Dept. of Agriculture	
<b>State Agencies</b>	
DLNR/BLNR	•
Hawai‘i Tourism Authority	
DHHL	
Office of Hawaiian Affairs	
Mauna Kea Forest Restoration Project	
Mauna Kea Watershed Alliance	
<b>Community Members/Organizations</b>	
PUEO	
Kui‘walu	
Gerald DeMello	
<b>Commercial Tour Operators</b>	
Super Vacation Hawai‘i	
Arnott’s Lodge & Hiking Adventures	
Taikobo Hawai‘i	
Mauna Kea Summit Adventures	
Hawaii Forest & Trail	
<b>Visitor, Commerce &amp; Economic Development</b>	
Island of Hawaii Visitors Bureau	
Japanese Chamber of Commerce	

**IMPLEMENTING AND EVALUATING THE  
COMPREHENSIVE MANAGEMENT PLAN FOR  
UH MANAGED LANDS ON MAUNA KEA**

February 2010



Office of Mauna Kea Management

640 N. Aohoku Place, Room 203

Hilo, Hawaii 96720



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## Implementation and Evaluation

### Acronymns

BLNR	Board of Land and Natural Resources
CMP	Comprehensive Management Plan
CRC	Cultural Resource Coordinator
CRMP	Cultural Resources Management Plan
DLNR	Department of Land and Natural Resources
DOCARE	Division of Conservation and Resources Enforcement (DLNR)
DOFAW	Division of Forestry and Wildlife (DLNR)
GIS	Geographic Information System
GPS	Global Positioning System
MKMB	Mauna Kea Management Board
OMKM	Office of Mauna Kea Management
MKSS	Mauna Kea Observatories Support Services
NAR	Natural Area Reserve
NARS	Natural Area Reserve System
NRC	Natural Resource Coordinator
NRMP	Natural Resources Management Plan
PAP	Public Access Plan
SHPD	State Historic Preservation Division (DLNR)
UH	University of Hawai‘i
UHH	University of Hawai‘i at Hilo
VIS	Visitor Information Station

# 1 Introduction

Implementing the Mauna Kea Comprehensive Management Plan (CMP) requires careful planning, sufficient funding, adequate staffing, and ongoing review and evaluation of program successes and failures. This document provides a strategy for implementing the Mauna Kea CMP, with a focus on immediate and short-term needs. It also identifies a methodology for evaluating the success of the plan and for determining any needed changes in management strategies.

## 1.1 Management Entities

UH Hilo, through its Office of Mauna Kea Management (OMKM), together with the Mauna Kea Management Board (MKMB) and the Kahu Kū Mauna Council, comprise the University of Hawai‘i’s management entity for its managed lands on Mauna Kea. The University of Hawai‘i at Hilo (UHH), through OMKM, is responsible for implementing the CMP for UH Management Areas on Mauna Kea. On management issues, OMKM consults with Kahu Kū Mauna Council and MKMB. The latter shall recommend a course of action. OMKM reports MKMB’s recommendations directly to the UHH Chancellor, who in turn forwards their recommendations to the University of Hawai‘i (UH) President for final decision. If required, the UH Board of Regents has final approval.

While policy-making authority ultimately rests with the UH Board of Regents, development of policy matters related to UH Management Areas on Mauna Kea originates with OMKM and UH Hilo, and as needed, in coordination with other UH divisions, State and Federal agencies, and appropriate community organizations. In the review and approval process for projects, including major projects, UH Hilo follows the guidelines established in the 2000 Master Plan, and protocols and policies established by the Board of Regents.

The roles of the various University entities involved in the management of UH Management Areas are outlined in Table 1.

**Table 1. University of Hawai‘i Divisions with Responsibility for Mauna Kea**

UH Division	Roles and Responsibilities
University of Hawai‘i Hilo Chancellor	<ul style="list-style-type: none"> <li>• Oversight of OMKM</li> <li>• Authorized to sign commercial tour use permits<sup>1</sup></li> </ul>
Office of Mauna Kea Management	<ul style="list-style-type: none"> <li>• Oversees efforts to protect, preserve and enhance the natural, cultural, and recreational resources of Mauna Kea.</li> <li>• Day-to-day management of the cultural and natural resources of the UH Management Areas</li> <li>• Ensure compliance with and implementation of the 2000 Master Plan and the 2009 Mauna Kea CMP</li> <li>• Manages together with Mauna Kea Observatories Support Services (MKSS) the ranger program</li> <li>• Oversees commercial permits</li> <li>• Approves film permits</li> <li>• Coordinates with other stakeholders, both public and private, on issues related to Mauna Kea</li> <li>• Works with other agencies on issues that are related to the mountain but are outside their jurisdiction</li> </ul>

<sup>1</sup> The University is responsible for the regulation of commercial tour and film activities.

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UH Division	Roles and Responsibilities
Mauna Kea Management Board	<ul style="list-style-type: none"> <li>• Volunteer board representing the community</li> <li>• Advises UHH Chancellor on activities, operations and land uses planned for Mauna Kea</li> <li>• Has advisory committees (MKMB Environment Committee, the Wēkiu Bug Scientific Committee, the MKMB Hawaiian Culture Committee, and the Public Safety Committee)</li> </ul>
Kahu Kū Mauna	<ul style="list-style-type: none"> <li>• Volunteer council appointed by MKMB</li> <li>• Advises MKMB, OMKM, and the UHH Chancellor on Hawaiian cultural matters affecting the UH Management Areas</li> </ul>
Mauna Kea Observatories Support Services	<ul style="list-style-type: none"> <li>• Funded by and operates under the direction of the observatories through the Mauna Kea Observatories Oversight Committee</li> <li>• 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)</li> <li>• Conducts Summit Access Road maintenance (including weekly grading of unpaved portion of road and snow removal)</li> <li>• Manages the Visitor Information Station (VIS)</li> <li>• Manages together with OMKM the ranger program</li> </ul>
Mauna Kea Rangers	<ul style="list-style-type: none"> <li>• On-site management of public health and safety               <ul style="list-style-type: none"> <li>- Distributes safety brochure</li> <li>- 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</li> <li>- Manages road closures for safety reasons</li> <li>- Provides emergency assistance when necessary</li> </ul> </li> <li>• On-site management of public access               <ul style="list-style-type: none"> <li>- Conducts summit patrols to observe and document activities</li> <li>- Provides information on the unique natural, cultural, and scientific resources; directs visitors to established hiking trails; and educates visitors on prohibited or destructive activities</li> <li>- Monitors commercial tours</li> <li>- Manages visitors on peak use days</li> <li>- Performs site maintenance activities including litter removal and trail maintenance to deter use of non-established trails</li> <li>- Supports other approved activities (e.g. filming, research) to ensure that impacts are minimal</li> <li>- Conducts twice yearly observatory Conservation District Use Permit compliance inspections</li> </ul> </li> </ul>

### 1.2 Management Actions

The Mauna Kea CMP contains a set of management actions designed to address the identified needs in managing the UH Management Areas. Management actions are organized by topic into component plans (see Table 2 and Appendices A and B). Each component plan has a specific desired outcome goal and an associated statement of need. The component plans address the range of management challenges from protecting resources, to managing access and use, to managing the built environment, to managing operations.

## Implementation and Evaluation

**Table 2. Mauna Kea CMP Component Plans**

Section	Component Plan
7.1	Understanding and Protecting Mauna Kea's Resources
7.1.1	Native Hawaiian Cultural Resources
7.1.2	Natural Resources
7.1.3	Education and Outreach
7.1.4	Astronomy Resources
7.2	Managing Access and Use
7.2.1	Activities and Uses
7.2.2	Permitting and Enforcement
7.3	Managing the Built Environment
7.3.1	Infrastructure and Maintenance
7.3.2	Construction Guidelines
7.3.3	Site Recycling, Decommissioning, Demolition and Restoration
7.3.4	Considering Future Land Use
7.4	Managing Operations
7.4.1	Operations and Implementation
7.4.2	Monitoring, Evaluation, and Updates
7.5	1995 Management Plan Controls

In addition to the management actions outlined in the Mauna Kea CMP, four sub-plans have been developed to provide specific recommendations and guidance. The sub-plans include:

- *Natural Resources Management Plan for the UH Management Areas on Mauna Kea (NRMP)* (September 2009)
- *Cultural Resources Management Plan for the UH Management Areas on Mauna Kea (CRMP)* (October 2009)
- *Mauna Kea Public Access Plan (PAP)* (January 2010)
- *Decommissioning Plan for the Mauna Kea Observatories* (January 2010)

Implementation of these plans will occur in conjunction with the Mauna Kea CMP. They will be referenced for detail and utilized to provide additional guidance as needed.

### 1.3 Programmatic Management Actions

Most of the desired outcomes, needs and management actions of the Mauna Kea CMP are presented in the component plans. However, there are several management actions at the programmatic level that apply to the overall OMKM management program and will be implemented as part of OMKM's general management strategy. These programmatic management actions include:

1. Establish cultural and natural resources management programs within OMKM.

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Obtain sufficient funding to support the programs (see Section 3). Hire staff members (see Section 2.2.1). Contract out high-priority, field-intensive projects such as baseline inventory studies, to ensure they are conducted quickly.

2. Continue to engage the MKMB committees in the review of proposals, projects, and management plans, and in making recommendations to the MKMB.

The establishment of the MKMB and its associated committees has enabled the broader community to become directly involved in advising on the management of Mauna Kea. The committees have been useful in involving a range of interests to ensure a collaborative and informed management planning process. Boards and committees will interact to achieve agreement on management goals, objectives, and activities.<sup>2</sup>

3. Continue to develop working relationships with Federal and State agencies.

Currently there is no mechanism for integrated or coordinated management of Mauna Kea's resources (including lands outside of the UH Management Areas). No regular meetings are held between the governmental agencies with management responsibilities for Mauna Kea—in particular involving OMKM and the various divisions of the Department of Land and Natural Resources (DLNR). Significantly, because there is so little interaction between the various State and Federal agencies responsible for the management of Mauna Kea, applicable rules and regulations in the UH Management Areas are little enforced. Development of coordinated management between State and Federal agencies and OMKM is discussed in Section 2.3.

4. Conduct public outreach and education to increase awareness of Mauna Kea's unique resources and their threats, increase community involvement in decision-making processes, and inform the public about progress regarding the protection of Mauna Kea's resources.

An information/education effort will support public participation and build management capacity related to adopted management actions. OMKM shall encourage and seek out community participation, including Native Hawaiians, in educational and outreach efforts. Informing the public about OMKM's management activities will help reassure the public that Mauna Kea's resources are being protected. Education and outreach activities are discussed in Section 7.1.3 of the CMP, and also in the CRMP, NRMP and PAP.

5. Establish legal authority for OMKM to promulgate rules and enforce regulations on Mauna Kea properties leased by the University of Hawai'i.

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. UH must now conduct a public process to develop public access-related administrative rules, which are subject to review and approval of the Board of Land and Natural Resources (BLNR). Principles and policies to guide UH in this process are provided in the PAP.

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<sup>2</sup> As the advisory board for OMKM, MKMB has responsibility for making final recommendations, based on input from committees including Kahu Kū Mauna and the MKMB Environment Committee. Potential conflicts between interests must be considered as this is done.

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6. Manage access to the summit to reduce impacts to cultural and natural resources.

Unrestricted access to the summit region can negatively impact resources. Strategies are provided in Sections 7.2 and 7.5 of the CMP, and also in the CRMP, NRMP, and PAP.

7. Follow the review process for new project proposals adopted by the MKMB.

This process is designed to ensure participation of relevant entities, compatibility with recommendations in approved management plans, and protection of cultural and natural resources when considering proposed future land uses.

## 2 Implementation Planning

OMKM and related entities provide day-to-day management of activities designed to protect the cultural, natural, recreational, and scientific resources of Mauna Kea. The Mauna Kea CMP and its related sub-plans provide a detailed framework for program development to shape management activities. Implementation of the Mauna Kea CMP involves prioritizing activities and conducting the management actions in a structured format in order to ensure adequate resources are available and desired outcomes are being met. Main components of an implementation plan include:

- A schedule for implementing priority management actions
- An estimate of the technical and financial resources and authorities needed to implement the plan
- Interim milestones to determine whether management actions are being implemented
- Criteria by which to measure progress toward achieving desired outcomes and goals
- A monitoring and evaluation framework to evaluate the effectiveness of implementation efforts

### 2.1 Schedule and Priorities

The implementation schedule for the Mauna Kea CMP identifies a timeframe for when each management action will be implemented and accomplished. The implementation schedule ranges from: Ongoing (currently being implemented), Immediate (1-3 years); Short-term (4-6 years); Mid-term (7-9 years); to Long-term (10+ years) (see Appendix B).<sup>3</sup> In most cases OMKM is either directly responsible for implementing the action or for ensuring its implementation by others (see Appendix C). Current efforts are focused on maintaining ongoing activities, ensuring resources to implement immediate and short-term actions, and beginning the planning process for mid-term and long-term actions. Inherent in this initial schedule is a prioritization of actions that focuses on solidifying a foundation for management activities that builds on the existing capacity. Immediate and short-term goals focus on hiring personnel, filling data gaps, and conducting monitoring to better inform management needs. Longer-term actions involve ongoing implementation, maintenance of the expanded program activities and development and execution of new activities resulting from the implementation of earlier management actions.

The primary immediate needs are for conducting baseline inventories and establishing research and monitoring efforts to fill data gaps and provide an on-going process for data collection to inform management efforts. Until good information about the resources has been obtained, it is difficult to plan with certainty the best methods for protection. Since there are some significant data gaps, in particular for

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<sup>3</sup> In cases where an action continues after it is initially developed or implemented, the shading continues to denote ongoing activity.

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natural resources, a considerable portion of the management effort and funding in the immediate and short-term will be focused on filling these gaps.<sup>4</sup> Inventories of cultural resources have been completed and the interpretation of the findings will be used to inform management actions. In addition, the development of policies and/or protocols for the range of cultural practices will be a time-consuming project in the first few years of CMP implementation. On-going activities in the immediate term, including monitoring, developing and implementing administrative rules, conducting public outreach and education, and training VIS personnel, staff, rangers, and observatory personnel will necessitate a substantial commitment of time and funding.

The adaptive management approach calls for continuous review and revision of activities based on the successes and failures of efforts. As described in Section 4.2.2, new, expanded, or amended management actions will be identified and incorporated into management strategies. **However, in the immediate and short-term, more focus will be placed on filling basic information gaps, which is essential to informing management.**

Table 3 summarizes the current number of management actions by component plan and implementation schedule. Appendix A contains a summary table of the Mauna Kea CMP management actions arranged by component plan, including implementation schedules and related sub-plan section references. Appendix B presents more detailed implementation schedules for each management action. Appendix C identifies entities responsible for implementation.

**Table 3. Number of Mauna Kea CMP Management Actions Planned for Implementation**

Component Plan	Implementation Schedule (as of 2010)						
	Ongoing	Immediate	Short-term	Mid-term	Long-term	Completed	As needed
<b>7.1: Understanding and Protecting Mauna Kea's Resources</b>							
7.1.1: Native Hawaiian Cultural Resources (14)	1	10	2			1	
7.1.2: Natural Resources (18)	2	5	3	3	2		3
7.1.3: Education and Outreach (8)	3	2		2	1		
7.1.4: Astronomy Resources (2)	2						
<b>7.2: Managing Access and Use</b>							
7.2.1: Activities and Uses (12)	7	2	2			1	
7.2.2: Permitting and Enforcement (8)	4	1				2	1
<b>7.3: Managing the Built Environment</b>							
7.3.1: Infrastructure and Maintenance (14)	1	4	3	3	2		1
7.3.2: Construction Guidelines (9)							9
7.3.3: Site Recycling, Decommissioning, Demolition & Restoration (3)							3

<sup>4</sup> As of the first draft of the CMP, no quantitative baseline inventories of the natural resources on UH Management Areas have been conducted except for the wēkiu bug, and therefore, the true state of the natural resources is currently unknown. Completion of the baseline inventories will necessitate a re-evaluation of the management actions recommended in CMP Section 7 and in the NRMP.

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Component Plan	Implementation Schedule (as of 2010)						
	Ongoing	Immediate	Short-term	Mid-term	Long-term	Completed	As needed
7.3.4: Considering Future Land Use (7)		1					6
<b>7.4: Managing Operations</b>							
7.4.1: Operations and Implementation (5)	4		1				
7.4.2: Monitoring, Evaluation, and Updates (3)		1	1				1
<b>7.5: 1995 Management Plan Controls (1)</b>							1

## 2.2 Personnel, Training, Equipment, and Facilities

OMKM has identified the initial staffing requirements and facilities needs for implementation of the CMP, including oversight of the cultural and natural resources management programs and expansion of the ranger program.

### 2.2.1 Personnel Requirements

Minimum personnel requirements for implementation of the CMP are presented in Table 4. Several of the positions listed below are existing funded OMKM positions or volunteer boards or committees. New positions requested include: Cultural Resource Coordinator (CRC); Natural Resource Coordinator (NRC); Education and Outreach Coordinator; GIS and Database Coordinator; Projects Administrator; Archaeologist; Chief Ranger; two additional rangers; fiscal support; and internal legal counsel.

The on-site ranger program has demonstrated effectiveness in protecting public health and safety, educating the public, and providing for resource protection. With a large spatial extent to cover, and the impending need to enforce administrative rules, there is a need to expand this program. There are currently no dedicated natural or cultural resources management personnel within OMKM—all resource management activities are currently conducted by other existing staff or contractors. A range of management actions could be conducted by contractors, including geographic information system (GIS) services, archaeological monitoring, natural resources baseline inventories, hydrological and climate studies, human activities studies, traffic and parking studies, and other research projects.

**Table 4. Personnel Requirements**

Position	Role	Current Status	Location	Funding Status
<b>ADMINISTRATIVE</b>				
OMKM Director	Oversight, guidance	Exists and filled (Interim director)	OMKM Hilo	Currently funded
OMKM Associate Director	Oversight, guidance	Exists and vacant	OMKM Hilo	Currently funded
Secretary	Clerical Support	Exists and filled	OMKM Hilo	Currently funded
Student help	General support	Exists and filled	OMKM Hilo	Currently funded
Projects Administrator	Administrative duties	Position does not yet exist	OMKM Hilo	Funding requested
Fiscal Support	Administrative duties	Position does not yet exist	OMKM Hilo	Funding requested

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Position	Role	Current Status	Location	Funding Status
Internal Legal Counsel	Legal support	Position does not yet exist	OMKM Hilo	Funding requested
Mauna Kea Management Board	Oversight, guidance	Exists and filled	Various (meets at OMKM Hilo)	Unfunded volunteers
<b>PROGRAMMATIC</b>				
Kahu Kū Mauna Council	Cultural guidance on management issues	Exists and filled	Various (meets at OMKM Hilo)	Unfunded volunteers
MKMB Environmental Committee	Oversight, guidance	Exists and filled	Various (meets at OMKM Hilo)	Unfunded volunteers
Cultural Resources Coordinator	Implementation of CMP / CRMP	Needed	OMKM Hilo, VIS	Funding requested
Natural Resources Coordinator	Implementation of CMP / NRMP	Needed	OMKM Hilo, VIS	Funding requested
Education and Outreach Coordinator	Outreach and education	Needed	OMKM Hilo, VIS	Funding requested
GIS and Database Coordinator	Implementation of CMP	Needed	OMKM Hilo	Funding requested
Volunteers	Implementation of CMP	As needed	Various	Unfunded volunteers, but requires oversight
Contractors	Implementation of CMP	As needed	Various	Requires funding (project specific)
Resource Librarians	Document retrieval and organization	Exists and filled	OMKM Hilo	Currently funded
<b>PUBLIC ACCESS, SAFETY, AND EDUCATION</b>				
Chief Ranger	Oversight guidance; visitor safety and outreach, and resource protection	Needed	VIS OMKM Hilo	Funding requested
Rangers	Visitor safety and outreach; resource protection	Exists and filled (5)	VIS	Currently funded
Rangers (additional)	Visitor safety and outreach; resource protection	Needed (2)	VIS	Funding requested
VIS Staff	Visitor outreach and education	Exists and filled through MKSS	VIS	Currently funded staff and unfunded volunteers
MKSS	Facility support	Exists and filled	Hale Pōhaku, VIS	Currently funded

### 2.2.2 Training Requirements

A training plan for employees and volunteers will be developed. Training needs to be addressed in the plan include specialized ranger training, field-personnel training, volunteer training and general staff training. General training requirements include review of applicable laws and regulations, basic cultural and natural resources orientation, education and outreach methods appropriate to Hawai‘i, and standard procedures for documenting potential violations (for non-enforcement personnel). Training requirements for all OMKM personnel involved in field-based management activities include general safety training, 4-

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wheel drive vehicle operation, orientation to working at high elevations, emergency response, CPR and first aid, Global Positioning System (GPS) operation, and recognition of culturally significant areas and items and protected flora and fauna. All staff who access the mountain should receive safety orientation and basic cultural and natural resources training. It is also advisable to provide basic emergency response training (including CPR and first aid) to all VIS staff. Education and training requirements for the CRC include gaining an intimate familiarity with the written literature on Mauna Kea’s cultural resources, including historic properties and cultural practices, and detailed knowledge of the location and status of historic properties in the UH Management Areas. Prior to hiring, the NRC should have extensive training in natural resources management issues, preferably in the form of a graduate degree and relevant work experience. On hiring, initial training would include training in project management and familiarization with the plant and animal species found on Mauna Kea, with emphasis on protected species.

### 2.2.3 Facilities and Equipment

Facilities and basic equipment needed to implement the CMP (not including administrative facilities and equipment already possessed by OMKM) include:

**Table 5. Facility and Equipment Requirements**

Facilities	Equipment
<u>OMKM Hilo</u> Office space for Education and Outreach Coordinator, CRC, NRC , GIS and Database Coordinator, Projects Coordinator, Archaeologist, Fiscal Support, legal counsel and Chief Ranger	Computers for all new hires and general software; printers, database software, and GIS software Digital cameras (one for each field person) Walkie-talkies (one for each field person) GPS units (one for each field person)
<u>Hale Pōhaku</u> Small office space and work area for Education and Outreach Coordinator, CRC, NRC, archeologist, and Chief Ranger Equipment storage area	4-wheel-drive vehicle(s) (available for resource management fieldwork) Field equipment (maps, backpacks, measuring tapes, metal stakes, flagging, compasses, field notebooks, binoculars, sample collection materials, vegetation maintenance tools) Identification guides (plants, birds, arthropods)

### 2.3 Coordination with Other Agencies

Coordination between State and Federal agencies regarding management of Mauna Kea’s resources is required. Some ideas for improving and coordinating multi-agency management activities on the mountain include developing interagency working groups, cooperative agreements/memorandums of understanding, and conducting interagency review.

*Interagency Working Group.* The principles of ecosystem management require that neighboring landowners and managers work together, guided by well-established management goals and visions. Overlapping and adjacent jurisdictions at the high elevations of Mauna Kea involve multiple agencies in management and decision-making. OMKM will serve as the focal point for coordinating actions related to the management of the UH Management Areas, including cross-boundary issues. An interagency working group can assist in streamlining management activities on the mountain and ensuring that management

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occurs at an ecosystem level. OMKM will communicate issues and concerns that it receives to the appropriate agencies and will follow through in their resolution.

*Cooperative Agreements.* OMKM should formalize management objectives and cross jurisdictional activities with memorandums of agreement or understanding similar to the recently developed cooperative agreement between BLNR and the University with respect to the Mauna Kea Ice Age Natural Area Reserve (NAR).<sup>5</sup> Cooperative arrangements shall be established with emergency-response agencies capable of providing services on Mauna Kea. Formal collaborative enforcement relationships shall be developed with the Hawai'i County Police Department and DLNR Division of Conservation and Resources Enforcement (DOCARE) for public access control through cooperative agreements or other means to strengthen the partnerships needed for effective response.

*CMP Interagency Review.* OMKM personnel will meet annually with relevant State and Federal agencies to review the status of the OMKM program. Before the meeting, the program coordinators will prepare an annual progress report describing the state of the resources, the status of the management program, progress towards meeting annual goals, and other pertinent information. The report will be reviewed and approved by MKMB, its committees, and OMKM and will then be submitted to the stakeholders and agencies participating in the review process, allowing ample time before the meeting for the agencies to review it. The annual meeting will provide a mechanism for various agencies to review the OMKM program, provide feedback on management activities, and suggest additional activities or changes to the management program. The annual progress report is discussed further in Section 4.2.1.

### 3 Financial Resources Required for Implementation

#### 3.1 Budget

OMKM has developed a proposed CMP implementation budget, based on known and estimated personnel, equipment, and program funding needs to continue Mauna Kea management operations and implement the Mauna Kea CMP. Future budgetary requirements will be identified as the management program is refined.

The proposed CMP implementation budget is in addition to the OMKM's current funding for carrying out general management activities, including the current ranger program, administrative salaries, and daily operations. The proposed CMP implementation budget is summarized in Table 6; additional details are provided in Appendix D. There are three primary budget categories: salaries, operating expenses, and program expenses (see Box 1). Appendix D contains a summary budget, along with a summary table of the Mauna Kea CMP management actions, organized by budget categories.

OMKM foresees high costs over the first few years of CMP implementation, but anticipates these costs diminishing once additional programs are implemented. Over the long-term funds will primarily be required to maintain daily operations in support of program management. Although many of the management actions can be implemented by operational funds to support staff, program-specific funds may be required for one-time projects or projects that require large amounts of funding, such as baseline

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<sup>5</sup> 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.

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inventories, research studies, and mitigation projects. Most of this funding is being requested in the “immediate” timeframe to cover baseline inventory studies, research needs, cultural protocol development, and public awareness activities. The need for additional program funds may be identified in the future. Other funds, such as those to cover capital or infrastructure costs (i.e., paving the road, improving visitor facilities) would be budgeted separately and would likely be funded by seeking legislative funding.

Although implementation of some CMP management actions is already occurring, full implementation of the CMP depends on receiving funding. Implementation of the CMP per the schedule outlined in Section 2.1 will begin upon receipt of funding.

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Table 6. Proposed OMKM Budget for Implementing the CMP, Years 1-6

Proposed OMKM Budget	Immediate			Short-term	
	Yr 1	Yr 2	Yr 3	Yrs 1-3	Yrs 4-6
<b>Salaries</b>					
Enforcement	175,100	175,100	175,100	525,300	525,300
Administrative and Professional	297,200	297,200	297,200	741,600	741,600
Other payroll	84,720	84,720	84,720	254,160	254,160
<b>Total Salaries</b>	507,020	507,020	507,020	1,521,060	1,521,060
<b>Operating Expenses</b>					
UH Hilo Government and Community Relations	181,750	181,750	181,750	545,250	545,250
Legal Fees	300,000	350,000	300,000	950,000	300,000
<b>Total Operating Expenses</b>	481,750	481,750	481,750	1,495,250	845,250
<b>Program Expenses</b>					
Research	556,200	526,500	317,500	1,400,200	557,500
Monitoring Programs	235,000	314,700	314,700	864,400	1,388,400
Management Programs	220,000	330,000	240,000	790,000	860,000
Public Awareness and Outreach	146,500	135,750	155,750	438,000	454,750
Equipment and Supplies	133,650	72,500	50,500	256,650	266,500
<b>Total Program Expenses</b>	1,291,350	1,379,450	1,078,450	3,749,250	3,527,150
<b>Total Salaries, Operating Expenses and Program Expenses</b>	2,280,120	2,418,220	2,067,220	6,765,560	5,893,460
Less Revenue from Fees	(100,000)	(100,000)	(100,000)	(300,000)	(300,000)
<b>Total Proposed Budget</b>	<b>\$2,180,120</b>	<b>\$2,318,220</b>	<b>\$1,967,220</b>	<b>\$6,465,560</b>	<b>\$5,593,460</b>

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### Box 1. OMKM Budget Categories

<b>Salaries</b>	
Rangers	Chief Ranger to manage the ranger program Two additional rangers
Professional	GIS & Database Coordinator
Administrative	Fiscal Support, Project Administrator, Internal Legal Counsel (Rules Administrator), and casual hire
Other payroll	Overtime, and seasonal requirements
<b>Operating Expenses</b>	
UH Hilo Government and Community Relations	UH Hilo activities relating to government advocacy and community relations on behalf of OMKM and Mauna Kea
Legal Fees	Retain outside legal counsel to review policies and other actions that may necessitate legal review
<b>Program Expenses</b>	
Research:	Baseline studies to fill in data gaps: Flora, arthropod, invasive species, mammals, birds, threatened and endangered species, erosion, hydrology, geology, erosion, human activity, climate, and air quality.  Other research needs: Continuing research on the wēkiu bug, public facilities, traffic and parking, energy audits
Monitoring:	Ongoing monitoring of cultural and natural resources (archaeological and historic properties, wēkiu bug). Initiate monitoring of new resource groups (flora, invasive species, arthropods, etc.)
Management Program Plans:	Develop cultural practices protocols/policies and management plans (burial treatment, historic property activities monitoring plan, invasive species prevention and control plans, and delineate areas of high biological diversity and unique communities and/or geological formation). Develop and implement administrative rules; review and update 1995 plan. Establish GIS program; map resources. Develop and implement education, training and outreach programs for the general public, staff, and stakeholders. Increase opportunities for public input and participate in stewardship activities.
Public Awareness:	Develop and print brochures, develop and implement signage program, and develop exhibits
Equipment and Supplies	Field equipment, computers, printers, software, vehicles, and furniture

### 3.2 Funding Sources

Primary operational funding for OMKM is received from the University as part of legislative appropriations based on internal program estimates. Funding is required to carry out the primary functions of the Mauna Kea CMP. Additional funds are obtained through the collection of fees from commercial tour operators. This money is deposited into an account that is used to cover expenses attributed to the commercial tour activities, including water, sewage fees, utilities, trash removal, road maintenance, and ranger and VIS staff time. Over time it may be possible for OMKM to identify and utilize other potential sources of funding and to develop a more diversified funding strategy. Other potential funding sources include:

*Existing astronomy entities.* Observatories currently contribute funding for VIS operations and road maintenance through MKSS, and also support a range of astronomy-related educational and outreach programs, both on-site and in the local communities. Mauna Kea observatories, through the Institute for Astronomy, contributed funding and logistical support for the recent archaeological inventory and wēkiu bug research and surveys. Funding for other resource management needs would be voluntary or part of renegotiated subleases.

*Potential new astronomy development.* All future astronomy development projects shall commit funding toward the broader resource management and maintenance responsibilities of Mauna Kea.

*User fees and licenses.* In addition to fees charged to commercial tour companies, other types of user fees may be instituted (e.g., entrance, shuttle, film permit). These funds would be deposited into the same fund.

*Fines.* Revenue collected from enforcement of rules (administrative fines) shall be deposited into a Mauna Kea lands management special fund that is used assist UH in local management of Mauna Kea.

*Research and other grants.* In addition to soliciting funds for research projects conducted in-house, OMKM also could provide logistical and other support for researchers planning to conduct research that would be compatible and consistent with the needs identified in the CMP.

*Private and non-profit donations.* Donations could be solicited for specific program needs.

*Corporate donations.* Local and national businesses could provide funding for specific program needs (educational camps, restoration programs) in return for recognition of their donation.

*Department of Land and Natural Resources funding.* As the agency with management authority for Mauna Kea's conservation district lands and the surrounding properties, support from DLNR could also be provided in the form of management activities such as fencing and hunting of feral ungulates and resource sharing.

*Cooperative arrangements.* Some of the costs of implementing the CMP may be defrayed by leveraging existing efforts and seeking in-kind services (e.g. data sharing, partnerships with State, county or Federal agencies to provide technical assistance, researchers or school programs).

## 4 Monitoring and Evaluation

An important part of the implementation of the Mauna Kea CMP is ensuring that management actions are achieving stated CMP desired outcomes and objectives. This section describes methods that can be used to monitor progress. It includes mandatory reporting procedures for the UH Board of Regents and BLNR on the progress of CMP implementation. Progress reports will document successes, failures, ongoing activities, the status of resources, and planned changes to improve management. The Mauna Kea CMP was designed using an adaptive management approach, which provides mechanisms by which to reevaluate implementation plans if substantial progress toward meeting desired outcomes is not being made.

### 4.1 Monitoring Implementation of the CMP

Regular monitoring of CMP implementation must occur in order to determine if progress is being made towards meeting the desired outcomes and objectives of the CMP. Monitoring is ongoing, with annual progress reports issued as described in Section 4.2.1. A major review and revision of the CMP will occur every five years, as described in Section 4.2.2.

Monitoring of a management program requires collection of concrete data that can be objectively analyzed and compared between years. This requires preparation at the beginning of each year, to determine the performance measures by which the year will be judged, followed by collection of data throughout the year on progress made toward meeting these measures. Preferably, the program coordinators will conduct brief monthly progress checks, to ensure that management activities are begun at appropriate times, that nothing is forgotten, and that projects are progressing as scheduled. Good notes taken throughout the year on the causes of delays or concerning unrealistic scheduling will support a more thoughtful analysis of the annual progress and help determine course-corrections for the following year. The annual monitoring program should occur as follows:

1. At the beginning of each year, the program coordinators will establish a list of priority management actions to occur that year, along with a realistic schedule. These actions should be derived from the CMP and its sub-plans, along with any new pressing issues that may have come to light since the last update of the CMP. See Appendix A for a list of management actions and implementation schedule.
  - a. The program coordinators should take care that the schedule is realistic and that there are not more tasks than can be completed in the number of man-hours available in the year. If it is consistently found that there are more tasks that must be completed than there are man-hours to complete them, staffing needs should be reviewed and new staff added, as needed. Management actions and projects that require a great deal of field labor or expertise that is not available in-house should be contracted out to ensure that they are conducted on schedule.
2. The priority management actions and the schedule should be placed into a progress-tracking datasheet in order to measure progress towards meeting the actions.
  - a. Larger actions and ongoing projects can be broken up into smaller components that can be individually tracked and checked off when complete. This will give a sense of

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progress for some of the items that may be complete only at the end of the year, or even after several years.

- b. As each action is completed, the program coordinators should enter the date of completion into the datasheet. It is easy to forget when projects were completed if you are attempting to recall this information at the end of a busy year.
  - c. Notes on problems encountered during management actions, interesting outcomes, successes, and ideas for improving management actions in the future should be kept on a linked document, to allow for easy cross-reference. This will help when writing the annual progress report.
  - d. The progress-tracking datasheets and schedule should be referenced at the beginning of each month, and updated as appropriate.
3. At the end of each year, the program coordinators should review the progress of that year's management program activities using the progress-tracking datasheet.
    - a. The progress-tracking datasheet will provide information on the percentage of management actions completed during the year and can reveal patterns in the strengths and weaknesses in the management program. The notes will provide helpful information on how best to improve the management actions, if they are to be continued the next year. Comparison of the projected schedule with the actual schedule will enable the program coordinators to better estimate timelines for future projects and will help determine if the scale and scope of the actions slated for the following year(s) are appropriate for the staffing level.
  4. After the progress-tracking datasheets are analyzed, the program coordinators should produce an annual report, as described in Section 4.2.1.

### 4.2 Review and Revision

The principles of adaptive management require regular review of the program and revision of management goals, objectives, actions, and techniques, to improve the performance of the program. There are two primary reasons to evaluate the implementation of the Mauna Kea CMP. The first is to demonstrate that by implementing the management actions, desired outcomes are being achieved. The second is to continually improve the management program in terms of efficiency and quality.

Two review processes, an annual progress report and a five-year management outcome assessment, are recommended to assess the success of the management program and to enable revision of the CMP.

#### 4.2.1 Annual Progress Report

At the end of each year OMKM should produce an annual progress report describing in detail the management goals, objectives, and actions for the year and what progress was made towards meeting them. The report should also describe actions to be taken to improve the program for the next year(s). This report is not intended to be a status report on the resources in UH Management Areas, rather it is meant to inform management and stakeholders of the progress of the program and direction it is to take in the future. This progress report should be developed before the following year's management priorities

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and schedule are set. The annual progress report will be reviewed by MKMB, MKMB committees, DLNR, other agencies, and the public, and submitted to BLNR (see Section 2.3).

### **4.2.2 Five-Year Management Outcome Analysis and CMP Revision**

The OMKM program should be subjected to a major review every five years, and the CMP should be revised, as necessary. This process should involve input from State and Federal agencies and the public.

#### **4.2.2.1 Management Outcome Analysis**

Determination of the outcome of management activities on the cultural and natural resources and of the success of the management program will be accomplished through a report summarizing (1) the state of cultural and natural resources on Mauna Kea and (2) the progress of the management program over the preceding five years.

The first section of the report will discuss the state of the cultural and natural resources in UH Management Areas. This section will summarize data collected during monitoring, research, restoration, and threat prevention and control activities conducted over the preceding five years. This portion of the report will analyze trends in cultural and natural resources, and the impacts (positive, negative, or neutral) that management actions have had on them. It will also summarize what future management actions are needed to protect, enhance, or restore Mauna Kea's cultural and natural resources.

The second section of the Five-Year Management Outcome Analysis should include a summary of the progress of the management program towards meeting management goals, objectives, and actions, as outlined in the CMP and in the annual listing of priority management actions (see Section 4.1). The source of information for this section of the report will be the annual progress reports from the last five years (see Section 4.2.1). Additionally, the CMP should be reviewed to determine if any desired outcomes were not addressed during the preceding five years, and if so, why not. This section will discuss strengths and weaknesses of the CMP and the management program and ways to improve them.

The purpose of the Management Outcome Analysis is to provide analysis of both the condition of the resources in UH Management Areas and the status of the CMP and management program. This information will be used to update the CMP so that it better addresses the needs of the resources, and to improve management activities through adaptive management.

A draft of this report should be submitted for review and comment to OMKM, MKMB, MKMB committees, and State and Federal agencies, as deemed necessary or appropriate. This will provide a mechanism for the interested parties to provide input into the direction the management program and suggestions for changes to the CMP. A final version of the report can then be presented to the public for comments and suggestions to be used in revising the CMP.

#### **4.2.2.2 Revising the CMP**

Following the production of the Five-Year Management Outcome Analysis, and after input from appropriate stakeholders, the CMP should be revised and updated to incorporate current status descriptions, new or updated desired outcomes, and new management actions. This major review and revision process should occur on the sixth year (to allow for time to process the five-year review). If it is determined that the five-year cycle is too short to show real changes in resource conditions, then after two five-year review and revision cycles, the frequency of the process can be lengthened, as needed.

## Implementation and Evaluation

As described above (see Section 2.1), the current status of natural resources is unknown, and baseline inventories are required. Completion of the baseline inventories will necessitate a re-evaluation of the management actions recommended in CMP Section 7 and in the NRMP. It may be necessary to complete one or more in-house reviews and revisions of the natural resource management priorities during the first several years of the program, to determine impediments to successful management of natural resources, develop realistic timelines for projects, and make necessary changes to the structure of the program. This can be done on an as-needed basis, to be determined by the NRC, OMKM director, and MKMB Environment Committee.

## Implementation and Evaluation

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**Appendix A. Mauna Kea CMP Management Actions: Cross-Reference  
to Subplans**

## Implementation and Evaluation

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## Implementation and Evaluation

<b>COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES</b>			
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>NATIVE HAWAIIAN CULTURAL RESOURCES</b>			
<b>Management</b>			
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	Immediate	NRMP 4.4.2 CRMP 4.3.3 PAP 4.2, 5.2, 6.1
CR-1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, cultural practitioners, 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.	Immediate	NRMP 5.1.1 CRMP 4.2.1 PAP 2.3, 6.1, 6.3, 6.8
CR-2	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.	Short-term	CRMP 2.4.2.1
<b>Cultural Practices</b>			
CR-4	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices.	Short-term	CRMP 4.2.1.1
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings	Immediate	CRMP 4.2.1.3 PAP 6.3. 6.8
CR-7	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	Immediate	CRMP 4.2.1.6
CR-8	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.	Immediate	CRMP 4.2.1.7
CR-9	A management policy for the cultural 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.	Immediate	CRMP 4.2.1.8 PAP 6.8
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	Immediate	CRMP 4.2.1.5 PAP 2.7.2, 6.3
<b>Historic Properties</b>			
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.	Ongoing	CRMP 4.3.1.6 PAP 2.5.1
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.	Immediate	CRMP 4.3.1 PAP 5.2

## Implementation and Evaluation

		<b>Implementation Schedule</b>	<b>Subplans</b>
CR-12	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.	Immediate	CRMP 4.2.7
CR-13	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB's Hawaiian Culture Committee, the Hawai'i Island Burial Council, recognized lineal or cultural descendants, and SHPD.	Immediate	CRMP 4.3.2, 4.3.7
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.	Completed	CRMP 4.3.7

Implementation and Evaluation

<b>COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES</b>			
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>NATURAL RESOURCES</b>			
<b>Threat Prevention and Control</b>			
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.	Immediate	NRMP 4.4 PAP 2.7.1, 4.2 5.2, 6.1, 6.3, 6.6
NR-2	Limit damage caused by invasive species through creation of an invasive species prevention and control program.	Immediate	NRMP 4.2.3.7, 4.3 PAP 2.7.1, 6.3
NR-1	Limit threats to natural resources through management of permitted activities and uses.	Short-term	NRMP 4.2.3
NR-3	Maintain native plant and animal populations and biological diversity.	Mid and Long-term	NRMP 4.2.3.8
NR-4	Minimize barriers to species migration, to help maintain populations and protect ecosystem processes and development.	Mid and Long-term	NRMP 4.2.3.11
NR-5	Manage ecosystems to allow for response to climate change.	Long-term	NRMP 4.2.3.11
<b>Ecosystem Protection, Enhancement &amp; Restoration</b>			
NR-7	Delineate areas of high native diversity, unique communities, or unique geological features within the Astronomy Precinct and at Hale Pōhaku and consider protection from development.	Short and Mid-term	NRMP 4.1, 4.2.3.1
NR-8	Consider fencing areas of high native biodiversity or populations of endangered species to keep out feral ungulates (applies to areas below 12,800 ft elevation).	Mid-term	NRMP 4.2.3.7, 4.3
NR-9	Increase native plant density and diversity through an outplanting program.	Long-term	NRMP 4.3, 4.4
NR-10	Incorporate mitigation plans into project planning and conduct mitigation following new development.	As needed	NRMP 4.3
NR-11	Conduct habitat rehabilitation projects following unplanned disturbances.	As needed	NRMP 4.3
NR-12	Create restoration plans and conduct habitat restoration activities, as needed.	As needed	NRMP 4.3
<b>Program Management</b>			
NR-13	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.	Immediate	NRMP 4.1.3.3, 4.3, 5.1.3 PAP 4.2, 4.5
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.	Short-term / As needed	NRMP 5.2 PAP 5.1, 5.2, 6.4, 6.7, 7

## Implementation and Evaluation

		Implementation Schedule	Subplans
<b>Inventory, Monitoring and Research</b>			
NR-16	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.	Ongoing	NRMP 4.1 PAP 6.4
NR-18	Develop geo-spatial database of all known natural resources and their locations in the UH Management Areas that can serve as baseline documentation against change and provide information essential for decision-making.	Ongoing	NRMP 4.1, 4.5
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.	Immediate	NRMP 4.1
NR-17	Conduct research to fill knowledge gaps that cannot be addressed through inventory and monitoring.	Immediate	NRMP 4.1.2.3

## Implementation and Evaluation

<b>COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES</b>			
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>EDUCATION AND OUTREACH</b>			
<b>Program Development</b>			
EO-1	Develop and implement education and outreach program	Immediate and Short-term	NRMP 4.1 CRMP 4.3.3 PAP 2.7.1, 4.2, 5.2, 6.1, 6.3, 6.6
<b>Education</b>			
EO-3	Continue to develop, update, and distribute materials explaining important aspects of Mauna Kea.	Ongoing	NRMP 4.4 CRMP 4.3.3 PAP 6.1
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).	Immediate	NRMP 4.4.2 PAP 4.2, 5.2, 6.2
EO-5	Develop interpretive features such as self-guided cultural walks and volunteer-maintained native plant gardens.	Mid-term	NRMP 4.3, 4.4.2 CRMP 4.3.3 PAP 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.	Mid-term	NRMP 4.4.2 PAP 5.2, 6.1
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.	Long-term	NRMP 4.4.2 PAP 6.1, 6.6
<b>Outreach</b>			
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.	Ongoing	NRMP 4.4.2 CRMP 5.3 PAP 5.2, 6.3, 6.8
EO-8	Provide opportunities for community members to participate in stewardship activities.	Ongoing	NRMP 4.4.2
<b>ASTRONOMICAL RESOURCES</b>			
<b>Protection of Astronomical Resources</b>			
AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	Ongoing	PAP 5.1
AR-2	Prevent light pollution, radio frequency interference (RFI) and dust.	Ongoing	NRMP 4.2.3.2

Implementation and Evaluation

<b>COMPONENT PLAN: MANAGING ACCESS AND USE</b>			
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>ACTIVITIES AND USES</b>			
<b>General Management</b>			
ACT-1	Continue and update managed access policy of 1995 Management Plan.	Short-term	NRMP 4.2, 4.4 PAP 2.5.2, 5.2, 7
ACT-2	Develop parking and visitor traffic plan.	Immediate	NRMP 3.1.1.2 PAP 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.	Ongoing	NRMP 5.1.2 CRMP 4.1.1 PAP 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.	Ongoing	NRMP 4.2.3.1 CRMP 4.1.2 PAP 2.5.1, 2.5.2, 2.6.3, 5.2, 6.3, 6.5
<b>Recreational</b>			
ACT-5	Implement policies to reduce impacts of recreational hiking	Short-term	NRMP 4.2.3.1 CRMP 4.2.3.4 PAP 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.	Ongoing	NRMP 4.2.3.1 CRMP 4.2.3.2 PAP 3.3.5, 5.2, 6.1, 6.3, 6.4
ACT-7	Confine University or other sponsored tours and star-gazing activities to previously disturbed ground surfaces and established parking areas.	Ongoing	NRMP 6.2.3 CRMP 4.2.3.1 PAP 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.	Immediate	NRMP 3.1.3.5 3.2.12 CRMP 4.2.3.3 PAP 2.5.1, 3.3.6, 5.2
<b>Commercial</b>			
ACT-9	Maintain commercial tour permitting process; evaluate and issue permits annually.	Ongoing	NRMP 3.1.4 PAP 2.5.3, 2.5.4, 3.3.3, 4.3, 5.2, 6.1, 6.7

## Implementation and Evaluation

ACT-10	Ensure OMKM input on permits for filming activities	Ongoing	NRMP 3.1.4.2 PAP 2.5.3, 3.3.3, 4.3, 6.1, 6.7
		<b>Implementation Schedule</b>	<b>Subplans</b>
ACT-11	Seek statutory authority for the University to regulate commercial activities in the UH Management Areas.	Completed	NRMP 1.4.2.3
<b>Scientific Research</b>			
ACT-12	Ensure input by OMKM, MKMB, and Kahu Kū Mauna on all scientific research permits and establish system of reporting results of research to OMKM.	Ongoing	NRMP 4.2.3.1, 4.2.3.7, 4.2.3.9 CRMP 4.2.6
<b>PERMITTING AND ENFORCEMENT</b>			
<b>Laws and Regulations</b>			
P-1	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.	Ongoing	NRMP 1.4.3 PAP 2.4, 2.5, 2.5.1, 2.5.2, 2.5.3, 5.1
P-2	Strengthen CMP implementation by recommending to the BLNR that the CMP conditions be included in any Conservation District Use Permit or other permit.	As needed	NRMP 1.4.3.2
P-3	Obtain statutory rule-making authority from the legislature, authorizing the University of Hawai'i to adopt administrative rules pursuant to Chapter 91 to implement and enforce the management actions.	Completed	NRMP 1.4.3.2
P-4	Educate management staff and users of the mountain about all applicable rules and permit requirements.	Immediate	NRMP 4.4 PAP 4.2, 5.2, 6.1, 6.2, 6.5
<b>Enforcement</b>			
P-5	Continue coordinating with other agencies on enforcement needs.	Ongoing	NRMP 5.1 PAP 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.	Completed / As needed	NRMP 1.4.2.3, 3.1.3.2, 5.1 PAP 4.4, 4.5, 4.6, 5.2, 6.5, 6.6
P-7	Develop and implement protocol for oversight and compliance with Conservation District Use Permits.	Ongoing	NRMP 1.4.2.3
P-8	Enforce conditions contained in commercial and Special Use permits.	Ongoing	NRMP 3.1.4 PAP 2.5.3, 3.3.3, 4.3, 4.5, 4.6, 6.5

## Implementation and Evaluation

<b>COMPONENT PLAN: MANAGING THE BUILT ENVIRONMENT</b>			
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>INFRASTRUCTURE AND MAINTENANCE</b>			
<b>Routine Maintenance</b>			
IM-1	Develop and implement an OMMP.	Ongoing	
IM-2	Reduce impacts from operations and maintenance activities by educating personnel about Mauna Kea's unique resources.	Immediate	NRMP 4.4
IM-3	Conduct historic preservation review for maintenance activities that will have an adverse effect on historic properties.	Short-term	CRMP 4.1.3
IM-4	Evaluate need for and feasibility of a vehicle wash station near Hale Pōhaku, and requiring that vehicles be cleaned.	Short-term	NRMP 4.2.3.7
IM-5	Develop and implement a Debris Removal, Monitoring and Prevention Plan.	Immediate	NRMP 4.2.3.5 CRMP 4.1.4, 4.3.4
IM-6	Develop and implement an erosion inventory and assessment plan.	Long-term	NRMP 3.2.4, 4.1.4.2, 4.2.3.4 PAP 2.6.3, 6.3, 6.4
IM-7	Prepare a plan, in collaboration with the Department of Defense, to remove military wreckage from a remote area of the UH Management Areas, while ensuring protection of natural and cultural resources.	Mid-term	CRMP 4.3.4.1
<b>Infrastructure</b>			
IM-8	Assess feasibility of paving the Summit Access Road.	Long-term	NRMP 4.2.3
IM-9	Evaluate need for additional parking lots and vehicle pullouts and install if necessary.	Mid-term	NRMP 3.1.1.2.3 PAP 5.2, 5.4, 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.	Immediate	NRMP 3.1.3.1, 3.2.3, 4.2.3.3 PAP 5.2, 6.4, 6.6, 6.7, 6.8
<b>Sustainable Technologies</b>			
IM-11	Encourage existing facilities and new development to incorporate sustainable technologies, energy efficient technologies, and LEED standards, whenever possible, into facility design and operations.	As needed	
IM-12	Conduct energy audits to identify energy use and system inefficiencies, and develop solutions to reduce energy usage.	Immediate	NRMP 4.2.3.3
IM-13	Conduct feasibility assessment, in consultation with Hawaii Electric Light Company, on developing locally-based alternative energy sources.	Mid-term	NRMP 3.1.1.2.3

## Implementation and Evaluation

IM-14	Encourage observatories to investigate options to reduce the use of hazardous materials in telescope operations.	Short-term	
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>CONSTRUCTION GUIDELINES</b>			
<b>General Requirements</b>			
C-1	Require an independent construction monitor who has oversight and authority to insure that all aspects of ground based work comply with protocols and permit requirements.	As needed	NRMP 3.2, 4.2
<b>Best Management Practices</b>			
C-2	Require use of Best Management Practices Plan for Construction Practices.	As needed	NRMP 4.2.3
C-3	Develop, prior to construction, a rock movement plan.	As needed	NRMP 4.2.3.1
C-4	Require contractors to provide information from construction activities to OMKM for input into OMKM information databases.	As needed	
C-5	Require on-site monitors (e.g., archaeologist, cultural resources specialist, entomologist) during construction, as determined by the appropriate agency.	As needed	CRMP 4.2.7
C-6	Conduct required archaeological monitoring during construction projects per SHPD approved plan.	As needed	CRMP 4.2.7
C-7	Education regarding historical and cultural significance	As needed	NRMP 4.4
C-8	Education regarding environment, ecology and natural resources	As needed	NRMP 4.4
C-9	Inspection of construction materials	As needed	NRMP 4.2.3.7
<b>SITE RECYCLING, DECOMMISSIONING DEMOLITION AND RESTORATION</b>			
<b>Site Recycling, Decommissioning, Demolition, and Restoration</b>			
SR-1	Require observatories to develop plans to recycle or demolish facilities once their useful life has ended, in accordance with their sublease requirements, identifying all proposed actions.	As needed	NRMP 4.3.3.4.1
SR-2	Require observatories to develop a restoration plan in association with decommissioning, to include an environmental cost-benefit analysis and a cultural assessment.	As needed	NRMP 4.3.3.4.1
SR-3	Require any future observatories to consider site restoration during project planning and include provisions in subleases for funding of full restoration.	As needed	NRMP 4.3.3.4.1

## Implementation and Evaluation

		Implementation Schedule	Subplans
<b>CONSIDERATION OF FUTURE LAND USE</b>			
<b>Facility Planning Guidelines</b>			
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	As needed	NRMP 5.1.1
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	Immediate	NRMP 4.3.3.1
FLU-3	Require cataloguing of initial site conditions for use when conducting site restoration.	As needed	
FLU-4	Require project specific visual rendering of both pre- and post-project settings to facilitate analysis of potential impacts to view planes.	As needed	NRMP 4.1.4.11
FLU-5	Require an airflow analysis on the design of proposed structures to assess potential impacts to aeolian ecosystems.	As needed	NRMP 4.1.4.4
FLU-6	Incorporate habitat mitigation plans into project planning process.	As needed	NRMP 4.3.3.3
FLU-7	Require use of close-contained zero-discharge waste systems for any future development in the summit region, from portable toilets to observatory restrooms, if feasible.	As needed	NRMP 3.1.1.2.6

## Implementation and Evaluation

<b>COMPONENT PLAN: MANAGING OPERATIONS</b>			
		<b>Implementation Schedule</b>	<b>Subplans</b>
<b>OPERATION AND IMPLEMENTATION OF THE CMP</b>			
<b>Management</b>			
OI-1	Maintain OMKM, MKMB, and Kahu Kū Mauna in current roles, with OMKM providing local management of the UH Management Areas, and MKSS providing operational and maintenance services.	Ongoing	
OI-2	Develop training plan for staff and volunteers.	Ongoing	NRMP 5.1 CRMP 5.2 PAP 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.	Ongoing	NRMP 5.1 PAP 5.1
OI-4	Establish grievance procedures for OMKM, to address issues as they arise.	Short-term	PAP 6.6
OI-5	Update and implement emergency response plan.	Ongoing	CRMP 4.1.6, 4.3.5 PAP 6.1, 6.4, 6.5, 6.7
<b>CMP MONITORING, EVALUATION AND UPDATES</b>			
<b>Management</b>			
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.	Immediate	NRMP 4.1.3.3 PAP 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.	Short-term / As needed	NRMP 5.2 CRMP 5.5 PAP 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.	As needed	PAP 7

## Implementation and Evaluation

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## **Appendix B. Mauna Kea CMP Management Actions: Implementation Schedule**

Note: In cases where an action continues after it is initially developed or implemented, the shading continues to denote ongoing activity.

## Implementation and Evaluation

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Implementation and Evaluation

Management Action	Initiation of Action	Duration of Implementation					
		Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
<b>COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES</b>							
<b>NATIVE HAWAIIAN CULTURAL RESOURCES</b>							
<b>Management</b>							
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	Immediate					
CR-1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, cultural practitioners, 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.	Immediate					
CR-2	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.	Short-term					
<b>Cultural Practices</b>							
CR-4	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices.	Short-term					
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings	Immediate					
CR-7	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	Immediate					
CR-8	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.	Immediate					
CR-9	A management policy for the cultural 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.	Immediate					
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	Immediate					
<b>Historic Properties</b>							

Implementation and Evaluation

Management Action	Initiation of Action	Duration of Implementation						
		Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+	
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.	Ongoing						
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.	Immediate						
CR-12	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.	Immediate						
CR-13	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB's Hawaiian Culture Committee, the Hawai'i Island Burial Council, recognized lineal or cultural descendants, and SHPD.	Immediate						
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.	Completed	--	--	--	--	--	--
<b>NATURAL RESOURCES</b>								
<b>Threat Prevention and Control</b>								
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.	Immediate						
NR-2	Limit damage caused by invasive species through creation of an invasive species prevention and control program.	Immediate						
NR-1	Limit threats to natural resources through management of permitted activities and uses.	Short-term						
NR-3	Maintain native plant and animal populations and biological diversity.	Mid and Long-term						
NR-4	Minimize barriers to species migration, to help maintain populations and protect ecosystem processes and development.	Mid and Long-term						
NR-5	Manage ecosystems to allow for response to climate change.	Long-term						
<b>Ecosystem Protection, Enhancement &amp; Restoration</b>								
NR-7	Delineate areas of high native diversity, unique communities, or unique geological features within the Astronomy Precinct and at Hale Pōhaku and consider protection from development.	Short and Mid-term						

## Implementation and Evaluation

	Management Action	Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
NR-8	Consider fencing areas of high native biodiversity or populations of endangered species to keep out feral ungulates (applies to areas below 12,800 ft elevation).	Mid-term						
NR-9	Increase native plant density and diversity through an outplanting program.	Long-term						
NR-10	Incorporate mitigation plans into project planning and conduct mitigation following new development.	As needed						
NR-11	Conduct habitat rehabilitation projects following unplanned disturbances.	As needed						
NR-12	Create restoration plans and conduct habitat restoration activities, as needed.	As needed						
<b>Program Management</b>								
NR-13	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.	Immediate						
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.	Short-term / As needed						
<b>Inventory, Monitoring and Research</b>								
NR-16	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.	Ongoing						
NR-18	Develop geo-spatial database of all known natural resources and their locations in the UH Management Areas that can serve as baseline documentation against change and provide information essential for decision-making.	Ongoing						
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.	Immediate						
NR-17	Conduct research to fill knowledge gaps that cannot be addressed through inventory and monitoring.	Immediate						

## Implementation and Evaluation

Management Action		Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
<b>EDUCATION AND OUTREACH</b>								
<b>Program Development</b>								
EO-1	Develop and implement education and outreach program	Immediate and Short-term						
<b>Education</b>								
EO-3	Continue to develop, update, and distribute materials explaining important aspects of Mauna Kea.	Ongoing						
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).	Immediate						
EO-5	Develop interpretive features such as self-guided cultural walks and volunteer-maintained native plant gardens.	Mid-term						
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.	Mid-term						
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.	Long-term						
<b>Outreach</b>								
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.	Ongoing						
EO-8	Provide opportunities for community members to participate in stewardship activities.	Ongoing						
<b>ASTRONOMICAL RESOURCES</b>								
<b>Protection of Astronomical Resources</b>								
AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	Ongoing						

Implementation and Evaluation

Management Action		Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
AR-2	Prevent light pollution, radio frequency interference (RFI) and dust.	Ongoing						
Management Action		Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
COMPONENT PLAN: MANAGING ACCESS AND USE								
ACTIVITIES AND USES								
General Management								
ACT-1	Continue and update managed access policy of 1995 Management Plan.	Short-term						
ACT-2	Develop parking and visitor traffic plan.	Immediate						
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.	Ongoing						
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.	Ongoing						
Recreational								
ACT-5	Implement policies to reduce impacts of recreational hiking	Short-term						
ACT-6	Define and maintain areas where snow-related activities can occur and confine activities to slopes that have a protective layer of snow.	Ongoing						
ACT-7	Confine University or other sponsored tours and star-gazing activities to previously disturbed ground surfaces and established parking areas.	Ongoing						
ACT-8	Coordinate with DLNR in the development of a policy regarding hunting in the UH Management Areas.	Immediate						
Commercial								
ACT-9	Maintain commercial tour permitting process; evaluate and issue permits annually.	Ongoing						
ACT-10	Ensure OMKM input on permits for filming activities	Ongoing						

Implementation and Evaluation

	Management Action	Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
ACT-11	Seek statutory authority for the University to regulate commercial activities in the UH Management Areas.	Completed	--	--	--	--	--	--

	Management Action	Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
<b>Scientific Research</b>								
ACT-12	Ensure input by OMKM, MKMB, and Kahu Kū Mauna on all scientific research permits and establish system of reporting results of research to OMKM.	Ongoing						
<b>PERMITTING AND ENFORCEMENT</b>								
<b>Laws and Regulations</b>								
P-1	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.	Ongoing						
P-2	Strengthen CMP implementation by recommending to the BLNR that the CMP conditions be included in any Conservation District Use Permit or other permit.	As needed						
P-3	Obtain statutory rule-making authority from the legislature, authorizing the University of Hawai'i to adopt administrative rules pursuant to Chapter 91 to implement and enforce the management actions.	Completed	--	--	--	--	--	--
P-4	Educate management staff and users of the mountain about all applicable rules and permit requirements.	Immediate						
<b>Enforcement</b>								
P-5	Continue coordinating with other agencies on enforcement needs.	Ongoing						
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.	Completed - As needed						

## Implementation and Evaluation

	Management Action	Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
P-7	Develop and implement protocol for oversight and compliance with Conservation District Use Permits.	Ongoing						
P-8	Enforce conditions contained in commercial and Special Use permits.	Ongoing						

## Implementation and Evaluation

Management Action	Initiation of Action	Duration of Implementation					
		Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
<b>COMPONENT PLAN: MANAGING THE BUILT ENVIRONMENT</b>							
<b>INFRASTRUCTURE AND MAINTENANCE</b>							
<b>Routine Maintenance</b>							
IM-1	Develop and implement an OMMP.	Ongoing					
IM-2	Reduce impacts from operations and maintenance activities by educating personnel about Mauna Kea's unique resources.	Immediate					
IM-3	Conduct historic preservation review for maintenance activities that will have an adverse effect on historic properties.	Short-term					
IM-4	Evaluate need for and feasibility of a vehicle wash station near Hale Pōhaku, and requiring that vehicles be cleaned.	Short-term					
IM-5	Develop and implement a Debris Removal, Monitoring and Prevention Plan.	Immediate					
IM-6	Develop and implement an erosion inventory and assessment plan.	Long-term					
IM-7	Prepare a plan, in collaboration with the Department of Defense, to remove military wreckage from a remote area of the UH Management Areas, while ensuring protection of natural and cultural resources.	Mid-term					
<b>Infrastructure</b>							
IM-8	Assess feasibility of paving the Summit Access Road.	Long-term					
IM-9	Evaluate need for additional parking lots and vehicle pullouts and install if necessary.	Mid-term					
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.	Immediate					
<b>Sustainable Technologies</b>							
IM-11	Encourage existing facilities and new development to incorporate sustainable technologies, energy efficient technologies, and LEED standards, whenever possible, into facility design and operations.	As needed					

Implementation and Evaluation

	Management Action	Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
IM-12	Conduct energy audits to identify energy use and system inefficiencies, and develop solutions to reduce energy usage.	Immediate						
IM-13	Conduct feasibility assessment, in consultation with Hawaii Electric Light Company, on developing locally-based alternative energy sources.	Mid-term						
IM-14	Encourage observatories to investigate options to reduce the use of hazardous materials in telescope operations.	Short-term						
<b>CONSTRUCTION GUIDELINES</b>								
<b>General Requirements</b>								
C-1	Require an independent construction monitor who has oversight and authority to insure that all aspects of ground based work comply with protocols and permit requirements.	As needed						
<b>Best Management Practices</b>								
C-2	Require use of Best Management Practices Plan for Construction Practices.	As needed						
C-3	Develop, prior to construction, a rock movement plan.	As needed						
C-4	Require contractors to provide information from construction activities to OMKM for input into OMKM information databases.	As needed						
C-5	Require on-site monitors (e.g., archaeologist, cultural resources specialist, entomologist) during construction, as determined by the appropriate agency.	As needed						
C-6	Conduct required archaeological monitoring during construction projects per SHPD approved plan.	As needed						
C-7	Education regarding historical and cultural significance	As needed						
C-8	Education regarding environment, ecology and natural resources	As needed						
C-9	Inspection of construction materials	As needed						
<b>SITE RECYCLING, DECOMMISSIONING DEMOLITION AND RESTORATION</b>								
<b>Site Recycling, Decommissioning, Demolition, and Restoration</b>								

## Implementation and Evaluation

	Management Action	Initiation of Action	Duration of Implementation					
			Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
SR-1	Require observatories to develop plans to recycle or demolish facilities once their useful life has ended, in accordance with their sublease requirements, identifying all proposed actions.	As needed						
SR-2	Require observatories to develop a restoration plan in association with decommissioning, to include an environmental cost-benefit analysis and a cultural assessment.	As needed						
SR-3	Require any future observatories to consider site restoration during project planning and include provisions in subleases for funding of full restoration.	As needed						
<b>CONSIDERATION OF FUTURE LAND USE</b>								
<b>Facility Planning Guidelines</b>								
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	As needed						
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	Immediate						
FLU-3	Require cataloguing of initial site conditions for use when conducting site restoration.	As needed						
FLU-4	Require project specific visual rendering of both pre- and post-project settings to facilitate analysis of potential impacts to view planes.	As needed						
FLU-5	Require an airflow analysis on the design of proposed structures to assess potential impacts to aeolian ecosystems.	As needed						
FLU-6	Incorporate habitat mitigation plans into project planning process.	As needed						
FLU-7	Require use of close-contained zero-discharge waste systems for any future development in the summit region, from portable toilets to observatory restrooms, if feasible.	As needed						

Implementation and Evaluation

Management Action	Initiation of Action	Duration of Implementation					
		Yr 1	Yr 2	Yr 3	Yrs 4-6	Yrs 7-9	Yrs 10+
<b>COMPONENT PLAN: MANAGING OPERATIONS</b>							
<b>OPERATION AND IMPLEMENTATION OF THE CMP</b>							
<b>Management</b>							
OI-1	Maintain OMKM, MKMB, and Kahu Kū Mauna in current roles, with OMKM providing local management of the UH Management Areas, and MKSS providing operational and maintenance services.	Ongoing					
OI-2	Develop training plan for staff and volunteers.	Ongoing					
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.	Ongoing					
OI-4	Establish grievance procedures for OMKM, to address issues as they arise.	Short-term					
OI-5	Update and implement emergency response plan.	Ongoing					
<b>CMP MONITORING, EVALUATION AND UPDATES</b>							
<b>Management</b>							
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.	Immediate					
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	Short-term / As needed					
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.	As needed					

**Appendix C. Mauna Kea CMP Management Actions: Entities  
Responsible for Implementation**

## Implementation and Evaluation

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Implementation and Evaluation

		Responsible Entity
COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES		
NATIVE HAWAIIAN CULTURAL RESOURCES		
Management		
CR-1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, cultural practitioners, 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.	To be developed by Kahu Kū Mauna, Mauna Kea Management Board (MKMB), and Hawaiian Cultural Committee, in consultation with families with historic connections Mauna Kea, cultural practitioners, and other Native Hawaiians.
CR-2	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.	OMKM
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	OMKM
Cultural Practices		
CR-4	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices.	OMKM, in partnership with UH-Hilo and Hilo Community College to establish an oral history program.
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings	Kahu Kū Mauna, and/or the Hawaiian Cultural Committee, in consultation with families of lineal connections, kūpuna, cultural practitioners, or Native Hawaiian organizations.
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	Kahu Kū Mauna, and/or the Hawaiian Cultural Committee, in consultation with families of lineal connections, kūpuna, cultural practitioners, or Native Hawaiian organizations.
CR-7	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	Kahu Kū Mauna, and/or the Hawaiian Cultural Committee, in consultation with families of lineal connections, kūpuna, cultural practitioners, or Native Hawaiian organizations.

## Implementation and Evaluation

		Responsible Entity
CR-8	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.	Kahu Kū Mauna, and/or the Hawaiian Cultural Committee, in consultation with families of lineal connections, kūpuna, cultural practitioners, or Native Hawaiian organizations.
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.	Kahu Kū Mauna, and/or the Hawaiian Cultural Committee, in consultation with families of lineal connections, kūpuna, cultural practitioners, or Native Hawaiian organizations.
<b>Historic Properties</b>		
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.	OMKM
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.	OMKM – completed by consultants
CR-12	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.	OMKM, Kahu Kū Mauna, DLNR (SHPD)
CR-13	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB’s Hawaiian Culture Committee, the Hawai‘i Island Burial Council, recognized lineal or cultural descendants, and SHPD.	OMKM, with approval as indicated.
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.	OMKM, rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.
<b>NATURAL RESOURCES</b>		
<b>Threat Prevention and Control</b>		
NR-1	Limit threats to natural resources through management of permitted activities and uses.	OMKM
NR-2	Limit damage caused by invasive species through creation of an invasive species prevention and control program.	OMKM
NR-3	Maintain native plant and animal populations and biological diversity.	OMKM
NR-4	Minimize barriers to species migration, to help maintain populations and protect ecosystem processes and development.	OMKM
NR-5	Manage ecosystems to allow for response to climate change.	OMKM

## Implementation and Evaluation

		Responsible Entity
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.	OMKM
<b>Ecosystem Protection, Enhancement &amp; Restoration</b>		
NR-7	Delineate areas of high native diversity, unique communities, or unique geological features within the Astronomy Precinct and at Hale Pōhaku and consider protection from development.	OMKM
NR-8	Consider fencing areas of high native biodiversity or populations of endangered species to keep out feral ungulates (applies to areas below 12,800 ft elevation).	OMKM
NR-9	Increase native plant density and diversity through an outplanting program.	OMKM
NR-10	Incorporate mitigation plans into project planning and conduct mitigation following new development.	Prepared by project applicants; approved by UH and DLNR.
NR-11	Conduct habitat rehabilitation projects following unplanned disturbances.	As determined
NR-12	Create restoration plans and conduct habitat restoration activities, as needed.	OMKM
<b>Program Management</b>		
NR-13	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.	OMKM; working group
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.	OMKM
<b>Inventory, Monitoring and Research</b>		
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.	OMKM
NR-16	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.	OMKM
NR-17	Conduct research to fill knowledge gaps that cannot be addressed through inventory and monitoring.	OMKM
NR-18	Develop geo-spatial database of all known natural resources and their locations in the UH Management Areas that can serve as baseline documentation against change and provide information essential for decision-making.	OMKM

## Implementation and Evaluation

		Responsible Entity
<b>EDUCATION AND OUTREACH</b>		
<b>Program Development</b>		
EO-1	Develop and implement education and outreach program	OMKM
<b>Education</b>		
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.	OMKM
EO-3	Continue to develop, update, and distribute materials explaining important aspects of Mauna Kea.	OMKM
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).	OMKM, with approval by DLNR
EO-5	Develop interpretive features such as self-guided cultural walks and volunteer-maintained native plant gardens.	OMKM/DLNR (SHPD/DOFAW)
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.	OMKM, with public and private schools, and universities.
<b>Outreach</b>		
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.	OMKM
EO-8	Provide opportunities for community members to participate in stewardship activities.	OMKM
<b>ASTRONOMICAL RESOURCES</b>		
<b>Protection of Astronomical Resources</b>		
AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	OMKM
AR-2	Prevent light pollution, radio frequency interference (RFI) and dust.	OMKM

## Implementation and Evaluation

<b>COMPONENT PLAN: MANAGING ACCESS AND USE</b>		<b>Responsible Entity</b>
<b>ACTIVITIES AND USES</b>		
<b>General Management</b>		
ACT-1	Continue and update managed access policy of 1995 Management Plan.	OMKM and DLNR
ACT-2	Develop parking and visitor traffic plan.	OMKM
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.	OMKM
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.	OMKM/DLNR working group
<b>Recreational</b>		
ACT-5	Implement policies to reduce impacts of recreational hiking	OMKM
ACT-6	Define and maintain areas where snow-related activities can occur and confine activities to slopes that have a protective layer of snow.	OMKM
ACT-7	Confine University or other sponsored tours and star-gazing activities to previously disturbed ground surfaces and established parking areas.	OMKM
ACT-8	Coordinate with DLNR in the development of a policy regarding hunting in the UH Management Areas.	OMKM and DLNR with hunting associations.
<b>Commercial</b>		
ACT-9	Maintain commercial tour permitting process; evaluate and issue permits annually.	OMKM
ACT-10	Ensure OMKM input on permits for filming activities	OMKM
ACT-11	Seek statutory authority for the University to regulate commercial activities in the UH Management Areas.	UH/OMKM – completed
<b>Scientific Research</b>		
ACT-12	Ensure input by OMKM, MKMB, and Kahu Kū Mauna on all scientific research permits and establish system of reporting results of research to OMKM.	OMKM, MKMB, and Kahu Kū Mauna

## Implementation and Evaluation

		Responsible Entity
<b>PERMITTING AND ENFORCEMENT</b>		
<b>Laws and Regulations</b>		
P-1	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.	UH / OMKM
P-2	Strengthen CMP implementation by recommending to the BLNR that the CMP conditions be included in any Conservation District Use Permit or other permit.	OMKM / BLNR
P-3	Obtain statutory rule-making authority from the legislature, authorizing the University of Hawai'i to adopt administrative rules pursuant to Chapter 91 to implement and enforce the management actions.	UH/OMKM – completed
P-4	Educate management staff and users of the mountain about all applicable rules and permit requirements.	OMKM
<b>Enforcement</b>		
P-5	Continue coordinating with other agencies on enforcement needs.	OMKM
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.	UH with rule-making authority, or DLNR (DOCARE)
P-7	Develop and implement protocol for oversight and compliance with Conservation District Use Permits.	DLNR (OCCL) with assistance from OMKM
P-8	Enforce conditions contained in commercial and Special Use permits.	OMKM, MKMB, and Kahu Kū Mauna

## Implementation and Evaluation

COMPONENT PLAN: MANAGING THE BUILT ENVIRONMENT		Responsible Entity
<b>INFRASTRUCTURE AND MAINTENANCE</b>		
<b>Routine Maintenance</b>		
IM-1	Develop and implement an OMMP.	OMKM
IM-2	Reduce impacts from operations and maintenance activities by educating personnel about Mauna Kea's unique resources.	OMKM and DLNR.
IM-3	Conduct historic preservation review for maintenance activities that will have an adverse effect on historic properties.	OMKM and DLNR (SHPD)
IM-4	Evaluate need for and feasibility of a vehicle wash station near Hale Pōhaku, and requiring that vehicles be cleaned.	OMKM
IM-5	Develop and implement a Debris Removal, Monitoring and Prevention Plan.	OMKM
IM-6	Develop and implement an erosion inventory and assessment plan.	OMKM
IM-7	Prepare a plan, in collaboration with the Department of Defense, to remove military wreckage from a remote area of the UH Management Areas, while ensuring protection of natural and cultural resources.	OMKM / Department of Defense
<b>Infrastructure</b>		
IM-8	Assess feasibility of paving the Summit Access Road.	OMKM
IM-9	Evaluate need for additional parking lots and vehicle pullouts and install if necessary.	OMKM
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.	OMKM
<b>Sustainable Technologies</b>		
IM-11	Encourage existing facilities and new development to incorporate sustainable technologies, energy efficient technologies, and LEED standards, whenever possible, into facility design and operations.	OMKM
IM-12	Conduct energy audits to identify energy use and system inefficiencies, and develop solutions to reduce energy usage.	OMKM
IM-13	Conduct feasibility assessment, in consultation with Hawaii Electric Light Company, on developing locally-based alternative energy sources.	OMKM

## Implementation and Evaluation

		Responsible Entity
IM-14	Encourage observatories to investigate options to reduce the use of hazardous materials in telescope operations.	OMKM
<b>CONSTRUCTION GUIDELINES</b>		
<b>General Requirements</b>		
C-1	Require an independent construction monitor who has oversight and authority to insure that all aspects of ground based work comply with protocols and permit requirements.	DLNR (OCCL) and OMKM
<b>Best Management Practices</b>		
C-2	Require use of Best Management Practices Plan for Construction Practices.	Project proposer, DLNR (OCCL) and OMKM
C-3	Develop, prior to construction, a rock movement plan.	Project proposer
C-4	Require contractors to provide information from construction activities to OMKM for input into OMKM information databases.	OMKM
C-5	Require on-site monitors (e.g., archaeologist, cultural resources specialist, entomologist) during construction, as determined by the appropriate agency.	Project proposer
C-6	Conduct required archaeological monitoring during construction projects per SHPD approved plan.	Project proposer with DLNR (SHPD) approval
C-7	Education regarding historical and cultural significance	OMKM in consultation with Kahu Kū Mauna or other Native Hawaiian groups, and approval by DLNR (SHPD).
C-8	Education regarding environment, ecology and natural resources	OMKM
C-9	Inspection of construction materials	OMKM under review by DLNR.
<b>SITE RECYCLING, DECOMMISSIONING DEMOLITION AND RESTORATION</b>		
<b>Site Recycling, Decommissioning, Demolition, and Restoration</b>		
SR-1	Require observatories to develop plans to recycle or demolish facilities once their useful life has ended, in accordance with their sublease requirements, identifying all proposed actions.	Project proposer
SR-2	Require observatories to develop a restoration plan in association with decommissioning, to include an environmental cost-benefit analysis and a cultural assessment.	Project proposer
SR-3	Require any future observatories to consider site restoration during project planning and include provisions in subleases for funding of full restoration.	Project proposer

## Implementation and Evaluation

## Implementation and Evaluation

		Responsible Entity
<b>CONSIDERATION OF FUTURE LAND USE</b>		
<b>Facility Planning Guidelines</b>		
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	OMKM and DLNR (OCCL)
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	OMKM
FLU-3	Require cataloguing of initial site conditions for use when conducting site restoration.	OMKM, project proposer
FLU-4	Require project specific visual rendering of both pre- and post-project settings to facilitate analysis of potential impacts to view planes.	Project proposer
FLU-5	Require an airflow analysis on the design of proposed structures to assess potential impacts to aeolian ecosystems.	Project proposer
FLU-6	Incorporate habitat mitigation plans into project planning process.	Project proposer
FLU-7	Require use of close-contained zero-discharge waste systems for any future development in the summit region, from portable toilets to observatory restrooms, if feasible.	Project proposer

## Implementation and Evaluation

		Responsible Entity
<b>COMPONENT PLAN: MANAGING OPERATIONS</b>		
<b>OPERATION AND IMPLEMENTATION OF THE CMP</b>		
<b>Management</b>		
OI-1	Maintain OMKM, MKMB, and Kahu Kū Mauna in current roles, with OMKM providing local management of the UH Management Areas, and MKSS providing operational and maintenance services.	OMKM, MKMB, and Kahu Kū Mauna
OI-2	Develop training plan for staff and volunteers.	OMKM
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.	OMKM
OI-4	Establish grievance procedures for OMKM, to address issues as they arise.	OMKM
OI-5	Update and implement emergency response plan.	OMKM
<b>CMP MONITORING, EVALUATION AND UPDATES</b>		
<b>Management</b>		
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.	OMKM
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	OMKM
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.	OMKM

## **Appendix D. Mauna Kea CMP Management Actions: Budget Requirements**

Includes:

- Budget for Implementing the Mauna Kea CMP: Summary
- CMP Management Actions Arranged by Budget Category

## Implementation and Evaluation

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## Implementation and Evaluation

### Budget for Implementing the Mauna Kea CMP: Summary

	Immediate Term				Short-term <sup>a</sup>
	Year 1	Year 2	Year 3	3 Year Total	Yrs 4 - 6
<b>Salaries</b>					
<b>Enforcement</b>					
Chief Ranger	72,100	72,100	72,100	216,300	216,300
Ranger	51,500	51,500	51,500	154,500	154,500
Ranger	51,500	51,500	51,500	154,500	154,500
<b>Subtotal Enforcement Salaries</b>	<b>175,100</b>	<b>175,100</b>	<b>175,100</b>	<b>525,300</b>	<b>525,300</b>
<b>Administrative and Professional</b>					
Projects Administrator	51,500	51,500	51,500	154,500	154,500
GIS and Database Coordinator	51,500	51,500	51,500	154,500	154,500
Fiscal Support	41,200	41,200	41,200	123,600	123,600
Internal Legal Counsel (Rules Administrator)	103,000	103,000	103,000	309,000	309,000
<b>Subtotal Administrative &amp; Professional Salaries</b>	<b>247,200</b>	<b>\$247,200</b>	<b>\$247,200</b>	<b>741,600</b>	<b>741,600</b>
<b>Other Payroll Costs</b>					
Overtime & seasonal requirements	34,720	34,720	34,720	104,160	104,160
Casual Hire	50,000	50,000	50,000	150,000	150,000
<b>Subtotal Other Payroll Costs</b>	<b>84,720</b>	<b>84,720</b>	<b>84,720</b>	<b>254,160</b>	<b>254,160</b>
<b>Subtotal Salaries</b>	<b>507,020</b>	<b>507,020</b>	<b>507,020</b>	<b>1,521,060</b>	<b>1,521,060</b>
<b>Operating Expenses</b>					
UH Hilo Government/Community Relations and Administrative Support	181,750	181,750	181,750	545,250	545,250
Legal Fees	300,000	350,000	300,000	950,000	300,000
<b>Subtotal Operating Expenses</b>	<b>481,750</b>	<b>531,750</b>	<b>481,750</b>	<b>1,495,250</b>	<b>845,250</b>
<b>Subtotal Salaries &amp; Operating Expenses</b>	<b>988,770</b>	<b>1,038,770</b>	<b>988,770</b>	<b>3,016,310</b>	<b>2,366,310</b>
<b>Program Expenses</b>					
Research					
Base line inventories	225,200	262,500	157,500	645,200	257,500
Other Research	331,000	264,000	160,000	755,000	300,000
Monitoring Programs					
Cultural Resources <sup>b</sup>	128,000	128,200	128,200	384,400	384,600
Natural Resources & Environmental Monitoring <sup>c</sup>	107,000	186,500	186,500	480,000	1,003,800
Management Programs and Plans					
Resources Management Programs	90,000	160,000	90,000	340,000	305,000
Compliance, Education, Training, Outreach	130,000	170,000	150,000	450,000	555,000
Public Awareness					
Brochures, Newsletters, Exhibits, Signage	75,750	65,000	85,000	225,750	242,500
Public Meetings <sup>d</sup>	70,750	70,750	70,750	212,250	212,250
Equipment and Supplies	133,650	72,500	50,500	256,650	266,500
<b>Subtotal Program Expenses</b>	<b>1,291,350</b>	<b>1,379,450</b>	<b>1,078,450</b>	<b>3,749,250</b>	<b>3,527,150</b>
<b>TOTAL SALARIES, OPERATING AND PROGRAM EXPENSES</b>	<b>2,280,120</b>	<b>2,418,220</b>	<b>2,067,220</b>	<b>6,765,560</b>	<b>5,893,460</b>
<b>Less Revenues from Fees</b>	<b>(100,000)</b>	<b>(100,000)</b>	<b>(100,000)</b>	<b>(300,000)</b>	<b>(300,000)</b>
<b>TOTAL SALARIES, OPERATING AND PROGRAM EXPENSES Less REVENUE</b>	<b>\$2,180,120</b>	<b>\$2,318,220</b>	<b>\$1,967,220</b>	<b>\$6,465,560</b>	<b>\$5,593,460</b>

a Total estimated budget for the three year period; b Includes a Cultural Resources Coordinator; c Includes a Natural Resources Coordinator; d Includes an Outreach Coordinator

## Implementation and Evaluation

### CMP Management Actions Arranged by Budget Category

Management Action		Implementation Schedule
<b>RESEARCH</b>		
<b>Baseline Inventories</b>		
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.	Immediate
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	Immediate
<b>Other Research</b>		
NR-17	Conduct research to fill knowledge gaps that cannot be addressed through inventory and monitoring.	Immediate
ACT-2	Develop parking and visitor traffic plan.	Immediate
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.	Immediate
IM-12	Conduct energy audits to identify energy use and system inefficiencies, and develop solutions to reduce energy usage.	Immediate
IM-9	Evaluate need for additional parking lots and vehicle pullouts and install if necessary.	Mid-term
IM-13	Conduct feasibility assessment, in consultation with Hawaii Electric Light Company, on developing locally-based alternative energy sources.	Mid-term
IM-8	Assess feasibility of paving the Summit Access Road.	Long-term
<b>MONITORING PROGRAMS</b>		
<b>Cultural Resources Monitoring</b>		
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.	Immediate
<b>Natural Resources and Environmental Monitoring</b>		
NR-16	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.	Ongoing
ACT-7	Confine University or other sponsored tours and star-gazing activities to previously disturbed ground surfaces and established parking areas.	Ongoing

## Implementation and Evaluation

Management Action		Implementation Schedule
<b>MANAGEMENT PROGRAMS AND PLANS</b>		
<b>Resources Management Program: Cultural Resources</b>		
CR-1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, cultural practitioners, 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.	Immediate
CR-4	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices.	Short-term
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings	Immediate
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	Immediate
CR-7	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	Immediate
CR-8	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.	Immediate
CR-9	A management policy for the cultural 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.	Immediate
CR-13	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB’s Hawaiian Culture Committee, the Hawai’i Island Burial Council, recognized lineal or cultural descendants, and SHPD.	Immediate
IM-3	Conduct historic preservation review for maintenance activities that will have an adverse effect on historic properties.	Immediate
CR-12	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.	Immediate
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.	Completed
<b>Resources Management Program: Natural Resources</b>		
NR-2	Limit damage caused by invasive species through creation of an invasive species prevention and control program.	Short-term
NR-7	Delineate areas of high native diversity, unique communities, or unique geological features within the Astronomy Precinct and at Hale Pōhaku and consider protection from development.	Short and Mid-term

## Implementation and Evaluation

<b>Management Action</b>		<b>Implementation Schedule</b>
NR-8	Consider fencing areas of high native biodiversity or populations of endangered species to keep out feral ungulates (applies to areas below 12,800 ft elevation).	Mid -Term
NR-3	Maintain native plant and animal populations and biological diversity.	Mid and Long-term
NR-4	Minimize barriers to species migration, to help maintain populations and protect ecosystem processes and development.	Mid and Long-term
NR-5	Manage ecosystems to allow for response to climate change.	Long-term
NR-9	Increase native plant density and diversity through an outplanting program.	Long-term
IM-6	Develop and implement an erosion inventory and assessment plan.	Long-term
NR-11	Conduct habitat rehabilitation projects following unplanned disturbances.	As needed
NR-12	Create restoration plans and conduct habitat restoration activities, as needed.	As needed
<b>Compliance, Education, Training, Outreach</b>		
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.	Ongoing
NR-18	Develop geo-spatial database of all known natural resources and their locations in the UH Management Areas that can serve as baseline documentation against change and provide information essential for decision-making.	Ongoing
AR-2	Prevent light pollution, radio frequency interference (RFI) and dust.	Ongoing
P-8	Enforce conditions contained in commercial and Special Use permits.	Ongoing
AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	Ongoing
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.	Ongoing
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.	Ongoing
ACT-9	Maintain commercial tour permitting process; evaluate and issue permits annually.	Ongoing
ACT-10	Ensure OMKM input on permits for filming activities	Ongoing
ACT-12	Ensure input by OMKM, MKMB, and Kahu Kū Mauna on all scientific research permits and establish system of reporting results of research to OMKM.	Ongoing

## Implementation and Evaluation

Management Action		Implementation Schedule
ACT-6	Define and maintain areas where snow-related activities can occur and confine activities to slopes that have a protective layer of snow.	Ongoing
ACT-8	Coordinate with DLNR in the development of a policy regarding hunting in the UH Management Areas.	Immediate
P-1	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.	Ongoing
P-7	Develop and implement protocol for oversight and compliance with Conservation District Use Permits.	Ongoing
P-5	Continue coordinating with other agencies on enforcement needs.	Ongoing
OI-5	Update and implement emergency response plan.	Ongoing
IM-1	Develop and implement an OMMP.	Ongoing
IM-5	Develop and implement a Debris Removal, Monitoring and Prevention Plan.	Immediate
OI-1	Maintain OMKM, MKMB, and Kahu Kū Mauna in current roles, with OMKM providing local management of the UH Management Areas, and MKSS providing operational and maintenance services.	Ongoing
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.	Ongoing
OI-2	Develop training plan for staff and volunteers.	Ongoing
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	Immediate
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.	Immediate
EO-1	Develop and implement education and outreach program	Immediate and Short-term
P-4	Educate management staff and users of the mountain about all applicable rules and permit requirements.	Immediate
IM-2	Reduce impacts from operations and maintenance activities by educating personnel about Mauna Kea's unique resources.	Immediate
NR-1	Limit threats to natural resources through management of permitted activities and uses.	Short-term
ACT-5	Implement policies to reduce impacts of recreational hiking	Short-term
CR-2	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.	Short-term

## Implementation and Evaluation

<b>Management Action</b>		<b>Implementation Schedule</b>
IM-14	Encourage observatories to investigate options to reduce the use of hazardous materials in telescope operations.	Short-term
IM-4	Evaluate need for and feasibility of a vehicle wash station near Hale Pōhaku, and requiring that vehicles be cleaned.	Short-term
OI-4	Establish grievance procedures for OMKM, to address issues as they arise.	Short-term
ACT-1	Continue and update managed access policy of 1995 Management Plan.	Short-term
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.	Short-term / As needed
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	Short-term / As needed
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.	Immediate
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.	Mid-term
IM-7	Prepare a plan, in collaboration with the Department of Defense, to remove military wreckage from a remote area of the UH Management Areas, while ensuring protection of natural and cultural resources.	Mid-term
ACT-11	Seek statutory authority for the University to regulate commercial activities in the UH Management Areas.	Completed
P-3	Obtain statutory rule-making authority from the legislature, authorizing the University of Hawai'i to adopt administrative rules pursuant to Chapter 91 to implement and enforce the management actions.	Completed
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.	Completed / As needed
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.	Long-term
IM-11	Encourage existing facilities and new development to incorporate sustainable technologies, energy efficient technologies, and LEED standards, whenever possible, into facility design and operations.	As needed
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.	As needed
<b>Project Development and Review</b>		
NR-10	Incorporate mitigation plans into project planning and conduct mitigation following new development.	As needed

## Implementation and Evaluation

<b>Management Action</b>		<b>Implementation Schedule</b>
P-2	Strengthen CMP implementation by recommending to the BLNR that the CMP conditions be included in any Conservation District Use Permit or other permit.	As needed
C-1	Require an independent construction monitor who has oversight and authority to insure that all aspects of ground based work comply with protocols and permit requirements.	As needed
C-2	Require use of Best Management Practices Plan for Construction Practices.	As needed
C-3	Develop, prior to construction, a rock movement plan.	As needed
C-4	Require contractors to provide information from construction activities to OMKM for input into OMKM information databases.	As needed
C-5	Require on-site monitors (e.g., archaeologist, cultural resources specialist, entomologist) during construction, as determined by the appropriate agency.	As needed
C-6	Conduct required archaeological monitoring during construction projects per SHPD approved plan.	As needed
C-7	Education regarding historical and cultural significance	As needed
C-8	Education regarding environment, ecology and natural resources	As needed
C-9	Inspection of construction materials	As needed
SR-1	Require observatories to develop plans to recycle or demolish facilities once their useful life has ended, in accordance with their sublease requirements, identifying all proposed actions.	As needed
SR-2	Require observatories to develop a restoration plan in association with decommissioning, to include an environmental cost-benefit analysis and a cultural assessment.	As needed
SR-3	Require any future observatories to consider site restoration during project planning and include provisions in subleases for funding of full restoration.	As needed
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	As needed
FLU-3	Require cataloguing of initial site conditions for use when conducting site restoration.	As needed
FLU-4	Require project specific visual rendering of both pre- and post-project settings to facilitate analysis of potential impacts to view planes.	As needed
FLU-5	Require an airflow analysis on the design of proposed structures to assess potential impacts to aeolian ecosystems.	As needed
FLU-6	Incorporate habitat mitigation plans into project planning process.	As needed
FLU-7	Require use of close-contained zero-discharge waste systems for any future development in the summit region, from portable toilets to observatory restrooms, if feasible.	As needed

## Implementation and Evaluation

<b>Management Action</b>		<b>Implementation Schedule</b>
<b>PUBLIC AWARENESS AND OUTREACH</b>		
<b>Brochures, Newsletters, Exhibits, Signage</b>		
EO-3	Continue to develop, update, and distribute materials explaining important aspects of Mauna Kea.	Ongoing
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).	Immediate
EO-5	Develop interpretive features such as self-guided cultural walks and volunteer-maintained native plant gardens.	Mid-term
<b>Public Meetings</b>		
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.	Ongoing
EO-8	Provide opportunities for community members to participate in stewardship activities.	Ongoing
NR-13	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.	Immediate

**From:** [Cory](#)  
**To:** [Ferreira, Darlene S](#)  
**Subject:** [EXTERNAL] K-2 Maunakea CMP July 22 BLNR  
**Date:** Tuesday, July 19, 2022 1:23:32 PM

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comments on item K 2: Maunakea Comprehensive Management Plan 2022 Supplement  
for State Board of Land and Natural Resources  
9 AM Friday, July 22, 2022

Aloha board members,

Please consider these concerns:

The 2009 CMP (Comprehensive Management Plan) said the University of Hawai'i would "support application for designation of the summit region...as a Traditional Cultural Property" (TCP).

But the 2022 CMP only supports having some parts of the summit be considered as TCPs. This is after hundreds of testifiers and lengthy studies have documented the cultural significance of the entire summit.

The 2022 CMP fails to address:

- how Maunakea rules apply to cultural practitioners
- how the transition to the Maunakea Authority under Act 255 will be accomplished
- whether the lease and Conservation District Use Permit for the Thirty Meter Telescope should be terminated
- whether there should be new land authorization that allows astronomy to continue on Maunakea beyond 2033
- whether State actions on Maunakea comply with the United Nations Declaration on the Rights of Indigenous Peoples
- the illegal control of the United States over Hawai'i

Mahalo,  
Cory Harden, Hilo



# KAHEA

THE HAWAIIAN-ENVIRONMENTAL ALLIANCE

PROTECTING

NATIVE HAWAIIAN

CUSTOMARY & TRADITIONAL

RIGHTS AND OUR FRAGILE

ENVIRONMENT

July 20, 2022

To: Board of Land and Natural Resources  
blnr.testimony@hawaii.gov

**Testimony of KAHEA: The Hawaiian-Environmental Alliance** to the Board of Land and Natural Resources in opposition to Item K-2: "Approval of the Center for Maunakea Stewardship's 2022 Mauna Kea Comprehensive Management Plan 2022 Supplement: Management Actions Update for the Mauna Kea Science Reserve at Kaoha Mauka, Hamakua District, Hawaii, Tax Map Key Nos. (3) 4-4-015:009, 012, and 001"

Aloha Chair Case and Board Members,

KAHEA: The Hawaiian-Environmental Alliance (KAHEA) opposes the staff's recommendation to approve the University of Hawaii's 2022 Comprehensive Management Plan (2022 CMP). KAHEA is a non-profit based in Hawai'i that has as its mission revitalizing our natural and cultural heritage. KAHEA has been involved in the protection of Mauna Kea for nearly the entire life of the organization, which was founded in 2000.

1. *The Land Board is being asked to approve a blank map, as was the University Board of Regents before it.*

The 2009 CMP first developed Cultural Resource management action No. 2 (CR-2), which provides: "Support application for designation of *the summit region of Maunakea* as a Traditional Cultural Property [TCP], under the National Historic Preservation Act of 1966, Public Law 89- 665, as amended." *Id.* at iii. The 2022 CMP reinterprets this provision to refer to *portions* of the summit region *further limited* to those portions in a "Figure 3.1" that shows up blank in the May 2022 versions of the 2022 CMP that was attached to the staff submittal<sup>1</sup> and that was before the UH Board of Regents when it was approved on May 19, 2022.<sup>2</sup> *Id.* at 3-3, 3-6 (blank map).

The draft March 2022 CMP<sup>3</sup> however included a Figure 3.1 that shows far less than "the summit region" would be within a supported TCP nomination.

UH and its sublessees frequently tout the community outreach and consultation that went into its original 2009 CMP. That community input included a stalwart message that all of Mauna Kea is a traditional and cultural landscape. The 2022 CMP significantly reduces the scope of CR-2 to: "not oppose an application submitted by any entity that requests portions of the summit region of Maunakea be designated a Traditional Cultural Property (TCP)[.]" The CMP refers to "portions of the Maunakea summit region similar to those shaded yellow in Figure 3.1[.]" As

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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."

discussed *supra*, the Board does not know what is “shaded yellow” because there is no map in the 2022 CMP before you.

Figure 3.1: Potential Traditional Cultural Properties in the UH Management Areas

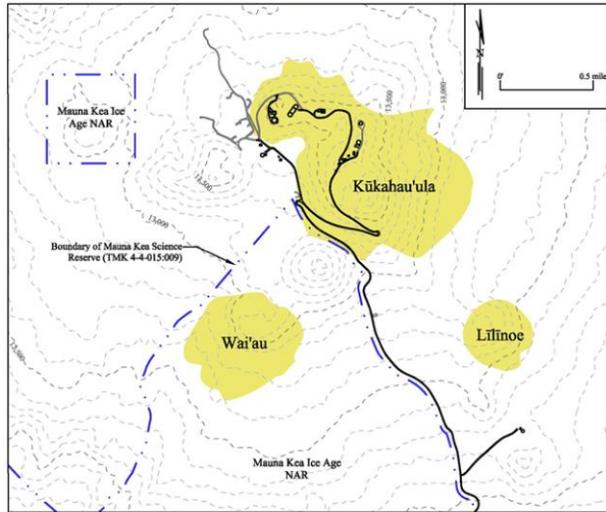


Figure 3.1: Potential Traditional Cultural Properties in the UH Management Areas

Source: Planning Solutions, Inc.

(Left: Mar. 2022 CMP; Right: 2022 CMP, Item K-2 at PDF31)

2. *2022 CMP's reinterpretation renders CR-2 meaningless and undermines community confidence in state management of Mauna Kea*

The draft March 2022 version of Figure 3.1 is problematic because it includes only three areas: Kūkahau'ula, Līlinoe and Wai'au. SHPD already recognizes these as TCPs and lists them on the Statewide Inventory of Historic Places as sites 50-10-23-21438 (Kūkahau'ula), 50-1-23-21439 (Pu'u Līlinoe), and 50-1-23-21440 (Wai'au).<sup>4</sup> That is, the 2022 CMP renders CR-2 meaningless because UH would thus only support designation of three places that are already determined to be TCPs.

Such sleights of hand are precisely the kinds of actions that justify the public's lack of confidence in public processes as predetermined, especially when it comes to Mauna Kea.

3. *CR-2 includes "the summit region" - not a carved up cultural landscape*

In any case, the issue is whether Mauna Kea's traditional cultural landscape can be carved up in this subsequent draft without compromising the intent of CR-2, which was already a compromise with invested communities who recognize all of Mauna Kea as a cultural landscape.

Inclusion of CR-2's support for nomination of "the summit region" as a TCP was made in view of multiple studies and expert opinions, including Thomas King, who opined "the landscape on the upper slopes of Mauna Kea meets the eligibility criteria for inclusion in the National Register as a TCP." *Id.* at 2-40. Further, "[w]hile King did not set a boundary, there are individuals who believe that all of the lands above the 6,000 ft elevation should be recognized as a TCP." *Id.* citing (NASA FEIS 2005:xv). Earlier, Dr. Charles Langlas of the University of Hawaii at Hilo wrote of his intention "to conclude that although the whole upper zone of Mauna Kea should be considered eligible as a traditional cultural property for the National Register of Historic Sites (as a historic district)," and only did not make the recommendation because he could not "make public the information he collected by Kupuna X" *Id.* quoting (Langlas 1999). Multiple other experts, including

Kepa Maly, who prepared 1999, 2000, and 2005 studies of the cultural meanings of Mauna Kea, have opined that Mauna Kea should formally be designated as a TCP.

4. *The 2022 CMP forecloses meaningful collaboration with communities most invested in the future and management of Mauna Kea.*

As with its 2009 predecessor, the 2022 CMP supplement excises at the outset issues raised by many, especially Kānaka Maoli communities, in regard to Mauna Kea. This forecloses the very “collaborative governance” the CMP professes to advance (it refers to collaboration 31 times). Each of these issues are critical to the meaningful engagement of our communities in the management of Mauna Kea and are not addressed in the proposed CMP:

- Whether or not the existing general lease between UH and DLNR and/or the CDUP for the TMT project (HA-3568) should, or should not, be terminated.
- Whether or not a new land authorization that would allow for astronomy to continue on Maunakea beyond 2033 should, or should not, be awarded in the future.
- Whether UH is, or is not, the appropriate entity to manage the cultural landscape and natural resources in the summit region or access to this sensitive area.
- Whether or not the state’s activities, uses, and management of Maunakea accord with the United Nations Declaration on the Rights of Indigenous Peoples.
- The lands now known as the UH Maunakea Lands were “stolen” from the Hawaiian Kingdom.
- The annexation of Hawai’i by the United States was not legal.
- The assertion of Hawaiian sovereignty.

The 2022 CMP disingenuously refers these fundamental issues to amorphous “policy makers” “broader decisions related to Mauna Kea.” *Id.* at 1-8. Far from community collaboration, the 2002 CMP defines away from its scope any opportunity to engage these critical community issues.

5. *2022 CMP fails to address its relationship to recent governance changes.*

Though it is supposed to be a “comprehensive” management plan, the 2022 CMP does not address how this plan interacts with Act 255, 2022 Session Laws of Hawai’i creating the Mauna Kea Management Authority. It also does not reconcile inconsistencies and lacunae in the 2019 Mauna Kea rules. For instance, the 2019 Mauna Kea rules referred to specific guidance from the CMP on hours of access and limitations. HAR sec. 20-26-38(c), but the 2022 CMP only vaguely references gathering input on this matter. *Id.* at 7-3. The 2022 CMP asserts there won’t be any restrictions on Hawaiian practitioner access, but also circuitously refers to implementing the 2019 Mauna Kea rules (which refers to the CMP), which are ambiguous at best in regard to regulation of cultural access and permitting. *Compare* p. 1-5 and p. 3-1, n.11.

In regard to Act 255, the CMP says nothing about the transition plan between now and 2028, nor what could occur after 2028 should a Mauna Kea Management Authority re-adopt the 2022 CMP.

In sum, the 2022 CMP supplement: (1) misinterprets 2009 CMP provisions, (2) unnecessarily alienates community concerns by defining them outside of its scope, and (3) does not add any new management actions that resolve unclearities in the 2019 Mauna Kea rules or any governance transition under Act 255.

The Board should reject the 2022 CMP.

Many thanks for considering our testimony.

KAHEA Board & Staff 2022

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<sup>1</sup> July 22, 2022 Board Submittal, Item K-2, [dlnr.hawaii.gov/wp-content/uploads/2022/07/K-2.pdf](https://dlnr.hawaii.gov/wp-content/uploads/2022/07/K-2.pdf).

<sup>2</sup> May 19, 2022 UH Board of Regents Materials, PDF 372,

[www.hawaii.edu/offices/bor/regular/materials/202205190930/BOR\\_05\\_19\\_2022\\_Materials.pdf](https://www.hawaii.edu/offices/bor/regular/materials/202205190930/BOR_05_19_2022_Materials.pdf).

<sup>3</sup> March 1, 2022 Center for Maunakea Stewardship, UH Draft Comprehensive Management Plan, [maunakea.konveio.com/sites/maunakea.konveio.com/files/u2/2022-03-01%20DraftCMPsupplement.pdf](https://maunakea.konveio.com/sites/maunakea.konveio.com/files/u2/2022-03-01%20DraftCMPsupplement.pdf).

<sup>4</sup> P. McCoy, S. Collins, S. Clark, and V. Park, Pacific Consulting Services, Inc. “A Cultural Resource Management Plan for the University of Hawai‘i Management Areas on Mauna Kea Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i TMK: (2) 4-4-012, 015: A Sub-Plan for the Mauna Kea Comprehensive Management Plan,” prepared for Office of Mauna Kea Management, at 2-49/PDF 98 (Oct. 2009).