A wide-angle photograph of the Maunakea mountain range in Hawaii. The foreground shows a dark, rocky landscape with patches of snow or ice. In the middle ground, several mountain peaks are visible, with the central peak being the most prominent. The sky is a mix of blue and orange, suggesting a sunset or sunrise. A dark, semi-transparent rectangular box is overlaid on the upper part of the image, containing the title text in white.

MAUNAKEA COMPREHENSIVE MANAGEMENT PLAN

BACKGROUND



Maunakea Lands are Conservation Lands

The UH Management Areas, or “Maunakea Lands”, are in the **State of Hawaii Conservation District.**

Land use in these areas are regulated by BLNR and all activities and uses within the Maunakea Lands, must follow BLNR’s Conservation District Regulations



Leases

The University of Hawaii (UH) holds 2 Leases (GL-4191, GL-5529) and an Easement from DLNR for Maunakea - These collective parcels are identified as the UH Management Areas.



The Comprehensive Management Plan (CMP)

The CMP is a DLNR Lease requirement.

DLNR Administrative Rules (HAR § 13-5-2) defines a management plan as a “a comprehensive plan for carrying out multiple land uses” on State conservation land.

The UH CMP specifically addresses multiple land uses and resource values within the UH Management Areas.

The UH CMP was submitted by UH to BLNR for public review and comment prior to approval by the Board.



Annual Reports

Annual Reports on the status of the management actions are provided to BLNR and DLNR.

Copies can be found on our website at:
https://hilo.hawaii.edu/maunakea/stewardship/plans_reports



2009 MAUNAKEA
COMPREHENSIVE
MANAGEMENT
PLAN

2009 CMP OVERVIEW

The 2009 CMP was developed to replace the 1995 Management Plan after the development of the 2000 Master Plan, feedback from auditor's reports, litigation and community input.

It was determined that UH didn't just need a Management Plan for its uses, but a Comprehensive Management plan for all the UH Maunakea Lands lands, even those subleased to other entities (Observatory Facilities).

The CMP utilizes adaptive management strategies to protect Mauna Kea's unique cultural and natural resources. The adaptive strategy suggests that as more information becomes available the CMP will be amended to adapt to the new information through annual and five-year reviews.

It is important to note that the 2022 CMP Supplement that will be later reviewed only updates certain sections of the 2009 CMP, primarily section 7, and not all of it. In addition, in 2019, the Administrative Rules were developed to regulate public & commercial activities.

2009 CMP SECTIONS

Section 1 – 4 : Importance of the CMP

- Discusses the importance of the CMP, the management environment that has resulted in the development of the CMP, and the process of developing it in consultation with interested community members.

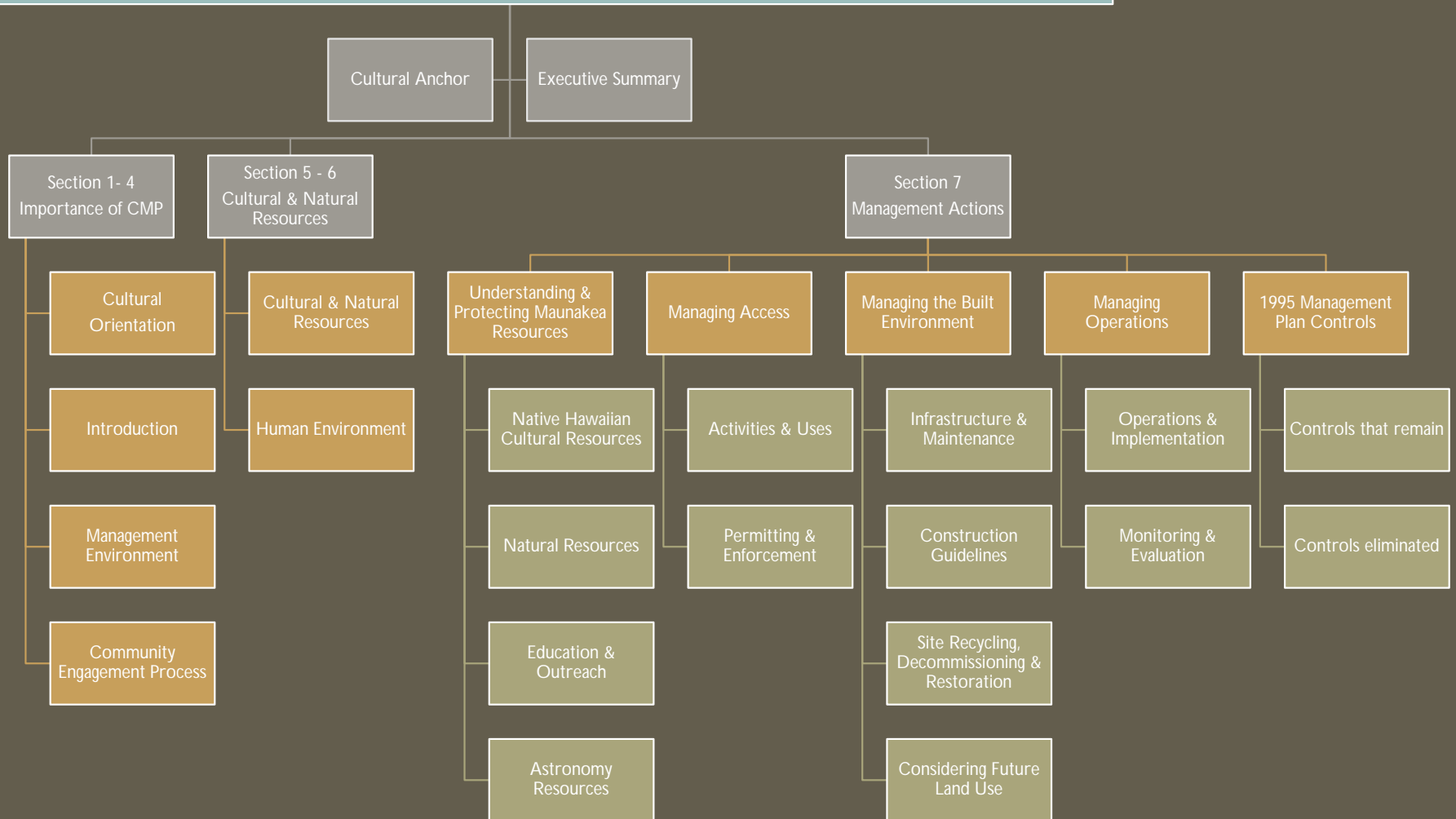
Section 5–6: Cultural & Natural Res.

- Detailed information about cultural and natural resources within Mauna Kea, and on the various activities and uses in the area.

Section 7: Management Actions

- Lists the management actions for dealing with multiple existing and future activities and uses in the UH Management Areas.

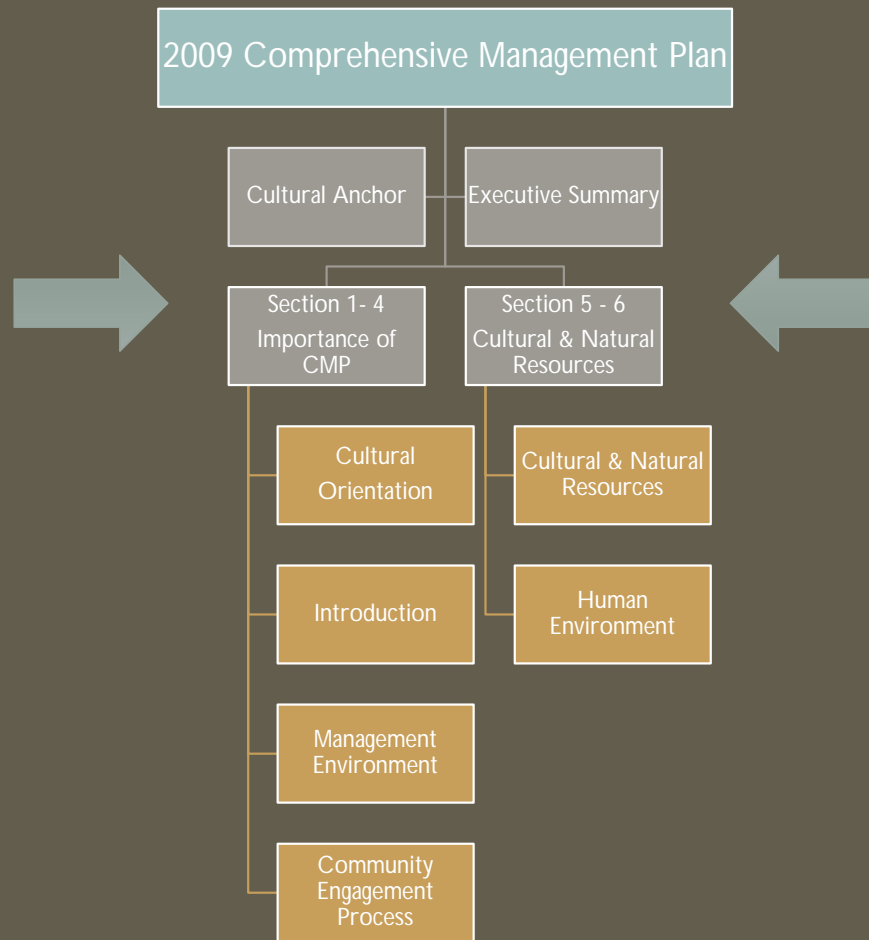
2009 Comprehensive Management Plan



SECTIONS 1-6

2009 Comprehensive Management Plan

The Cultural Anchor, Executive Summary and Sections 1-4 will need to be updated as they are related to UH's process for the development of the CMP. However, some of this information could be used as a historical framework in MKSOA's Plan.

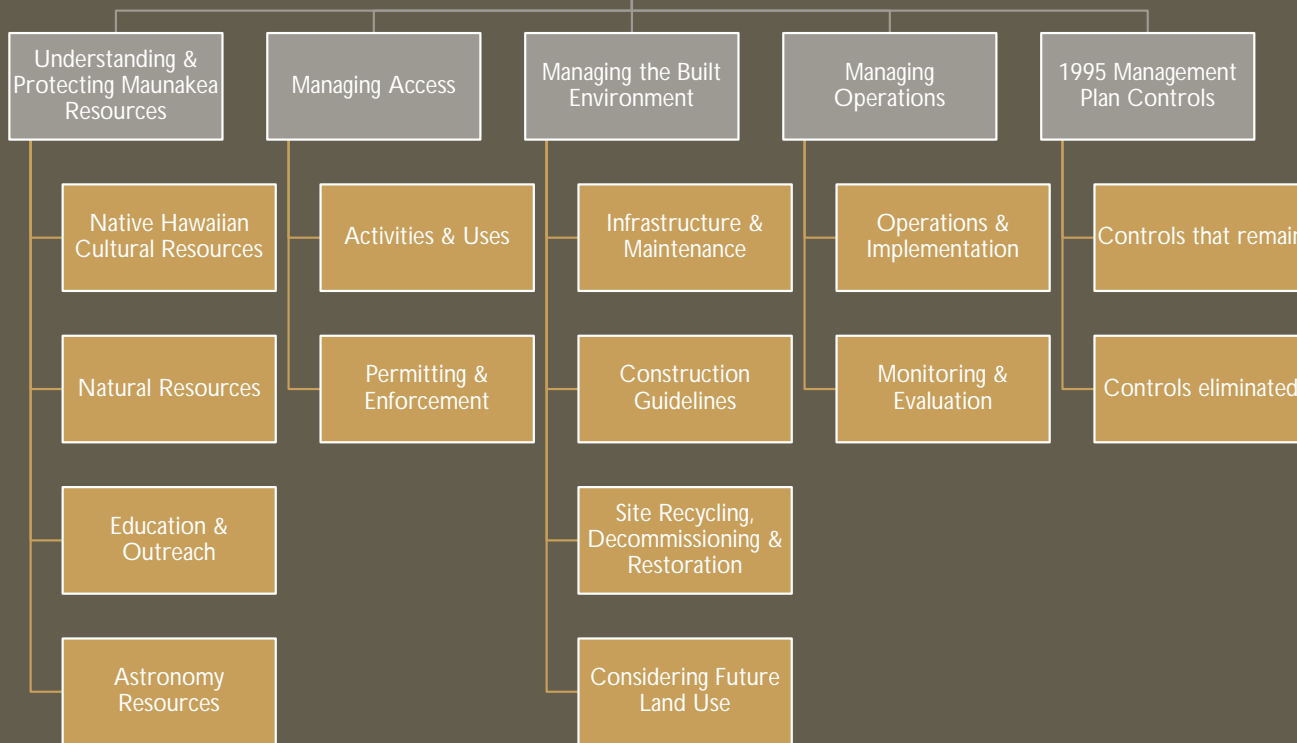


Sections 5-6 provides a historical background and most of the information could be used in MKSOA's plan.

SECTION 7

Section 7 Management Actions

Section 7 describes the management actions needed to address the various management needs identified during the process developing the CMP.



Management actions are organized by topic into component plans.

Each Component Plan is organized in five sections:

1. Desired Outcome – The goal
2. Current Status – Background information & current management activities and any problems.
3. Need – What type of actions are needed to achieve the desired outcome.
4. Management Actions – Specific aspects of program development to meet the needs and achieve desired outcomes.
5. Additional considerations – Additional detail on developing and implementing management activities.

2009 CMP – SECTION 7 – DESIRED OUTCOMES

Table 2-1. CMP Management Objectives, Component Plans, and Desired Outcomes

7.1 Understanding and Protecting Mauna Kea's Cultural and Natural Resources
7.1.1 Native Hawaiian Culture and History 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 historic properties in the UH Management Areas.
7.1.2 Natural Resources 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.
7.1.3 Education and Outreach Build and maintain a constituency to engage in active and meaningful stewardship of Mauna Kea, through education and involvement of the public, to support and enhance conservation of the natural, cultural, and astronomical resources of Mauna Kea.
7.1.4 Astronomy Resources Astronomical resources must also be protected. The University's lease of the Summit Area provides that the scientific reserve shall be operated as a buffer zone to prevent intrusion of activities incompatible with the use of the land as a scientific complex or observatory. The lease recognizes light and dust interference as well as certain types of electronic installation as incompatible.

7.2 Managing Access, Activities and Uses
7.2.1 Activities and Uses To retain and enhance recreational and cultural activities, ensure regulation of commercial activities, and support scientific studies while maintaining adequate protection of resources, educating users regarding resource sensitivity, and ensuring the health and safety of those visiting or working at Mauna Kea.
7.2.2 Permitting and Enforcement Achieve compliance with existing and any new policies and regulations designed to manage and minimize human impacts, to preserve and protect Mauna Kea's resources.
7.3 Managing the Built Environment
7.3.1 Infrastructure and Maintenance Manage the built environment by implementing an Operations, Monitoring and Maintenance Plan (OMMP) containing specific maintenance strategies and protocols that will result in minimal disruptions to activities and uses, minimize impacts to the resources, and ensure that permittees remain compliant with their CDUP requirements.
7.3.2 Construction Guidelines Minimize adverse impacts to resources during all phases of construction, through use of innovative best management practices.
7.3.3 Site Recycling, Decommissioning, Demolition, and Restoration To the extent possible, reduce the area disturbed by physical structures within UH Management Areas by upgrading and reusing buildings and equipment at existing locations, decommissioning, and removing obsolete facilities, and restoring impacted sites.
7.3.4 Considering Future Land Use To protect cultural and natural resources in the assessment of future projects.
7.4 Managing Operations
7.4.1 Operations and Implementation Conduct effective operations to support management that is focused on resource protection, education, and public safety.
7.4.2 Monitoring, Evaluation, and Updates Determine whether management actions are achieving the goals of the CMP and provide a process for improving and updating management strategies through evaluation and revisions of the CMP.

DEVELOPMENT OF MANAGEMENT ACTIONS

Management Actions were created with the understanding that:


1. Maunakea is a culturally significant site.

2. The high elevation areas of Maunakea represent a unique global resource that should be preserved for future generations.

3. Management activities will be focused on limiting the impacts of human activities on cultural and natural resources.

4. The planning and execution of resource management programs will involve input from the larger community (i.e., scientists, educators, cultural practitioners, public, etc....).

Management Actions	
Category	No. of Actions
Cultural Resources (CR)	14
Natural Resources (NR)	18
Education and Outreach (EO)	8
Astronomy Resource (AR)	2
Activities and Uses (ACT)	12
Permitting and Enforcement (P)	8
Infrastructure and Maintenance (IM)	14
Construction Guidelines (C)	9
Site Recycling, Decommissioning, Demolition and Restoration (SR)	3
Future Land Use (FLU)	7
Operations and Implementation (OI)	5
Monitoring, Evaluation, & Updates (MEU)	3
Summary of Status of Actions	103



SAMPLE OF MANAGEMENT ACTIONS

NATIVE HAWAIIAN CULTURAL RESOURCES

Historic Properties	
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.

NATURAL RESOURCES

Threat Prevention and Control	
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.

EDUCATION AND OUTREACH

Education	
EO-2	Require orientation of users, with periodic updates and a certificate of completion, including but not limited to visitors, employees, observatory staff, contractors, and commercial and recreational users.
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).

ACTIVITIES AND USES

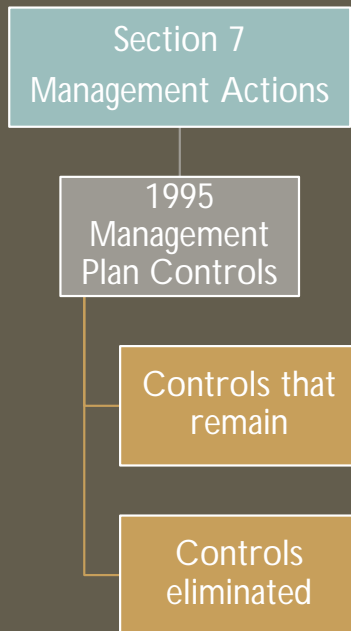
General Management	
ACT-2	Develop parking and visitor traffic plan.
ACT-4	Develop and enforce a policy that maintains current prohibitions on off-road vehicle use in the UH Management Areas and that strengthens measures to prevent or deter vehicles from leaving established roads and designated parking areas.

CONSTRUCTION GUIDELINES

General Requirements	
C-1	Require an independent construction monitor who has oversight and authority to ensure that all aspects of ground-based work comply with protocols and permit requirements.
Best Management Practices	
C-2	Require use of Best Management Practices Plan for Construction Practices.

SECTION 7 – 1995 MANAGEMENT CONTROLS

Section 7 -1995 Management Plan Controls – This CMP supersedes and replaces the 1995 Management Plan while at the same time incorporating most controls from that document to ensure they continue in full force and effect. *Note: This was prior to the Administrative Rules being adopted in 2019 which superseded these controls.*



1. Controls to remain

- i. Setting Hours of Operation
- ii. MKSR Access Controls – Opening & Closing of the road
- iii. Visitor Vehicles – 4WD vehicles recommended
- iv. Waiver of Liability – Visitors are warned to proceed at their own risk.
- v. Alcoholic Beverages – Not allowed above HP
- vi. Archaeological sites with the UH Areas – Unlawful to take or alter historic property on state lands (Chapter 6E-11 HRS)
- vii. Mauna Kea Ice Age Natural Area Reserve – Managed by NAR and DLNR
- viii. Halep haku – No fire, no littering, and walk on designated paths.
- ix. Public Activities – Controls still in place for visitors, hikers and hunting.
- x. Management & Control of Commercial Activities still in place

1. Controls eliminated

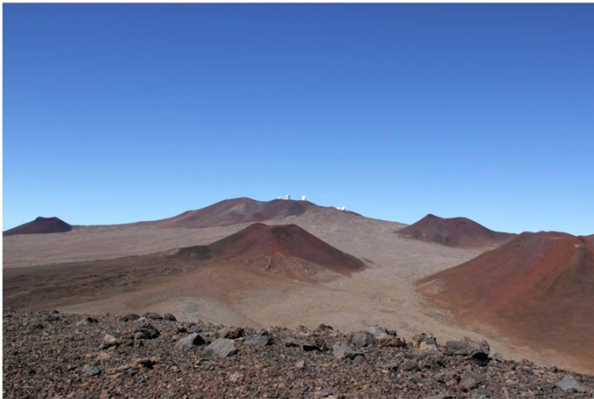
1. National Ski Patrol – Patrol and duties eliminated (no longer in operation)
2. Commercial snow play tours, and Commercial ski meets and events.



2021 OUTCOME ANALYSIS REPORT

**MAUNAKEA
COMPREHENSIVE MANAGEMENT PLAN
OUTCOME ANALYSIS REPORT**

COMPREHENSIVE MANAGEMENT ACTION MEU-1



The summit region of Maunakea. Photo September 2013, J. Kirkpatrick, OMKM

AUGUST 2021

2021 OUTCOME ANALYSIS REPORT



OBJECTIVE

A Progress Report that describes the state of the resources, the status of the various management programs, progress towards meeting CMP goals, and other relevant information. The Outcome Analysis Report is made up of three sections:



STATE OF THE RESOURCES

Present state of cultural and natural resources, including a summary of data collected during monitoring, research, restoration, and threat prevention and control activities and the implementation of actions.



MANAGEMENT & OUTREACH

The goals and objectives of the CMP have to do with the way the UH Management Areas are administered and managed. Includes and overview of outreach and education efforts, followed by a topic-by-topic discussion of the extent to which efforts have resulted in UH meeting the CMP's goals and objectives for each category.



PROGRAM STATUS

Extent to which the UH's efforts have been successful in achieving the CMP's stated goals and objectives (desired outcomes) and identifies areas where additional effort and/or a correction in course, i.e., adaptive management, may be appropriate

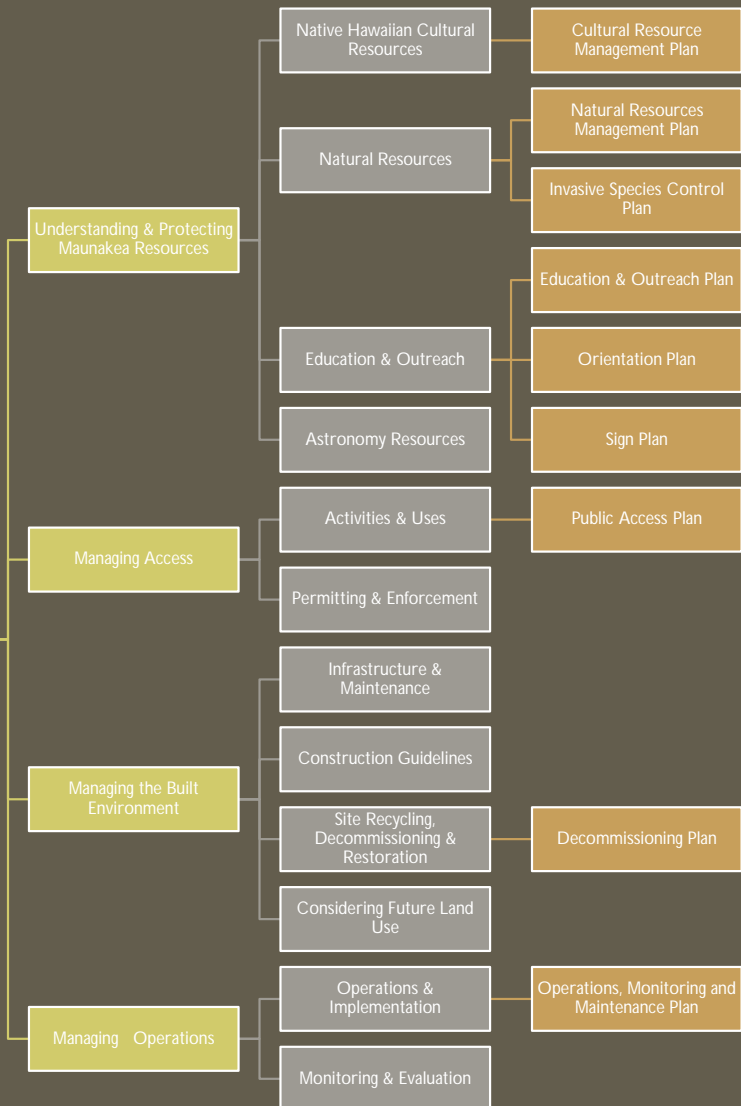
STATUS OF
MANAGEMENT
ACTIONS FROM
OUTCOME
ANALYSIS
REPORT

Status of Management Actions by Category

Category	No. of Actions	Status C	Status C/O	Status O	Discussion
Cultural Resources (CR)	14	8	1	5	2.1
Natural Resources (NR)	18	1	2	15	2.2
Education and Outreach (EO)	8	-	1	7	0
Astronomy Resource (AR)	2	-	-	2	0
Activities and Uses (ACT)	12	1	6	5	0
Permitting and Enforcement (P)	8	2	-	6	0
Infrastructure and Maintenance (IM)	14	-	3	11	0
Construction Guidelines (C)	9	-	-	9	0
Site Recycling, Decommissioning, Demolition and Restoration (SR)	3	-	-	3	0
Future Land Use (FLU)	7	1	-	6	0
Operations and Implementation (OI)	5	2	1	2	0
Monitoring, Evaluation, & Updates (MEU)	3	-	-	3	0
All Actions	103	15	14	74	

Key: "C" = Completed; "C/O" = Program framework completed; implementation is ongoing; "O" = ongoing

Section 7 – Management Actions



2009 CMP SECTION 7 COMPLETED ACTIONS

Table 2.1 Completed Management Actions

Mgmt. Action	Description	For Completion Details: See OAR Section
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings.	2.1.3.5
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	2.1.3.6
CR-7	Kahu Kū Mauna (KKM) shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	2.1.3.7
CR-8	Develop and adopt a management guideline for the UH Management Areas on the scattering of cremated human remains.	2.1.3.8
CR-9	A management guideline for the cultural appropriateness of building ahu or "stacking of rocks" will need to be developed by KKM who may consider similar policies adopted by Hawai'i Volcanoes National Park.	2.1.3.9
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.	2.1.3.11
CR-12	Consult with KKM about establishing buffers (preservation zones) around known historic sites near facilities, to protect them from potential future development.	2.1.3.12
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.	2.2
ACT-11	Seek statutory authority for the University to regulate commercial activities in the UH Management Areas.	3.4.2.11
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.	3.5.2.3
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.	2.5.2.6
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.	3.9.2.2
OI-1	Maintain OMKM, MKMB, and KKM in current roles, with OMKM providing local management of the UH Management Areas, and MKSS providing operational and maintenance services.	3.10.2.1
OI-2	Develop training plan for staff and volunteers.	3.10.2.2

Source: Tables 4.1 through 4.25 in 2021 OAR.



COMPREHENSIVE MANAGEMENT PLAN: 2022 SUPPLEMENT

MANAGEMENT ACTIONS UPDATE



ADAPTIVE MANAGEMENT

Adaptive Management

- This supplement together with the OAR and other annual reports provides a systematic process for continually improving management policies and practices for resource protection by learning from past and current outcomes.
- This is called “**ADAPTIVE MANAGEMENT**” and allows resource managers and stewards to continue a management action as written in 2009 or to adjust course and refine them based on lessons learned and input from the community and stakeholders.

Two Changes

Changes in the 2022 Supplement focused on:

- 1) Updating the wording in Section 3.1.1
 - 2) Replacing Section 7 of 2009 CMP.
- Please Note: This supplement does not propose new activities or land uses.

Measurements

- This supplement also provides clear and transparent measurements of accountability and progress for implementers (UH and its advisory committees) and those overseeing (primarily DLNR) and the interested public.

CMP 2022 SUPPLEMENT – SECTION 3 UPDATE

The wording in Section 3.1.1 was updated to reflect the following:

This wording replaces Section 3.1.1 of the 2009 CMP and updates the definition of “UH Management Areas.” The term “UH Management Areas” will be synonymous with “Mauna Kea lands,” which are defined under Hawai‘i Revised Statutes (HRS) § 304A-1901 as:



... the lands that the University of Hawaii is leasing from the board of land and natural resources, including the Mauna Kea Science Reserve, Hale P haku, the connecting roadway corridor between Hale P haku and the Mauna Kea Science Reserve, and any other lands on Mauna Kea that the University of Hawaii leases or over which the University of Hawaii acquires control or jurisdiction.

CMP 2022 SUPPLEMENT – SECTION 7 UPDATE MANAGEMENT ACTIONS

Section 7 has been updated to divide it into 12 subjects, each with its own chapter:

1. Cultural Landscape
2. Natural Resource
3. Education & Outreach
4. Astronomical Resources
5. Activities & Uses
6. Permitting & Enforcement
7. Infrastructure & Maintenance
8. Construction Guidelines
9. Site Recycling, Decommissioning, & Restoration
10. Considering Future Land Use
11. Operations & Implementation
12. Monitoring, Evaluations & Updates

Each Subject Includes:

Introduction, which provides a brief background and identifies the section of the 2021 OAR where information concerning the status of the topic can be found.

Desired Outcome, which summarizes the goal(s) associated with the subject. The desired outcomes have not substantially changed; UH's remains committed to achieving the desired outcomes approved in 2009.

Need, which provides a brief high-level discussion of why the subject and its management actions are needed to advance proper management of the UH Management Areas.

Management Actions, which provides details regarding each of the subject's ongoing management actions. This document updates the CMP management actions, where warranted, per management action MEU-2 to better realize the desired outcomes using adaptive management techniques that considered lessons learned, information collected, and input received since the CMP was adopted. The management actions have been adapted to be consistent with the Maunakea Administrative Rules, which did not exist in 2009.

CHAPTER 11 SITE RECYCLING, DECOMMISSIONING, DEMOLITION, & RESTORATION

11.1 INTRODUCTION

Section 7.3.3 of the 2009 CMP provides general guidance on-site recycling, decommissioning, demolition, and restoration for astronomy facilities in the UH Management Areas. Additional procedural guidance for demolition and site restoration is detailed in the *Site Decommissioning Plan for Mauna Kea Observatories* (Sustainable Resources Group International, Inc., January 2010b). Information concerning the current status of site recycling and decommissioning can be found in Section 3.8 of the 2021 OAR (Appendix A).

11.2 DESIRED OUTCOME

The “desired outcome” with respect to site recycling, decommissioning, demolition, and restoration is:

To the extent possible, reduce the area disturbed by physical structures within the UH Management Areas by upgrading and reusing buildings and equipment at existing locations, removing obsolete facilities, and restoring impacted sites to pre-disturbed condition.

11.3 NEED

Each astronomy facility must identify what course of action they will pursue when the life expectancy of their facility is reached or when their lease/sublease expires. While UH will be responsible for overseeing compliance with the CMP, compliance with this section requires a collaborative effort between UH, DLNR, and the astronomy facility operators.

11.4 MANAGEMENT ACTIONS

As discussed in Section 3.8 of the 2021 OAR, the three CMP management actions related to site recycling, demolition, & restoration are “ongoing,” meaning that guidelines and procedures are in place and are being implemented. The management actions are listed in Table 11.1 and discussed in Sections 11.4.1 and 11.4.2.

Chapter 11: An example of one of the shorter of chapters

Chapter 11 Related Management Actions

Table 11.1 Ongoing Site Recycling, Decommissioning, Demolition, and Restoration Management Actions

Mgmt. Action	Description	Discussion
SR-1	Require astronomy facilities to develop plans for reuse or removal in accordance with the <i>Decommissioning Plan for the Mauna Kea Observatories</i> (Sustainable Resources Group International, Inc., January 2010b).	11.4.1
SR-2	Require astronomy facilities to develop plans for site restoration in accordance with the <i>Decommissioning Plan for the Mauna Kea Observatories</i> (Sustainable Resources Group International, Inc., January 2010b).	11.4.1
SR-3	Require future astronomy facilities to consider decommissioning during project planning.	11.4.2

Note: The exact wording of the management actions listed in the table has been revised from the 2009 CMP and the 2021 OAR to reflect the progress made to date, adaptation made based on the lessons learned, information collected, and input received.

Source: Adapted from the 2021 OAR, Table 3.18.

Note: This Chapter is one of the shortest and just an example. Chapters related to Cultural Resources, Natural Resources and Education are substantially longer....

2022 CMP - ADAPTIVE MANAGEMENT EXAMPLE

Adaptive management can be found throughout the 2009 CMP Supplement. CR-14 in the 2009 CMP is a simple example of an action that was adapted and why:

* CR-14 : Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, KKM Council, and SHPD.

In the 2022 Supplement it has been updated to:

CMP 2022 SUPPLEMENT
CULTURAL LANDSCAPE

3.4.7 CR-14: REPORT DISTURBANCE OF HISTORIC SHRINE OR BURIAL SITE

As part of their regular activities the Rangers will continue to monitor activities within the UH Management Areas on a daily basis and are in a good position to monitor for/observe disturbance of a historic property which may include shrines or possible burial sites and/or to take reports from others who have seen such actions. Changes to a historic property may include rebuilding or “restoration” of a shrine. Per this management action and consistent with HRS Chapter 6E and its implementing rules, the Rangers will immediately report historic property disturbances to CMS, and then CMS will immediately forward the report to DOCARE, KKM Council, and SHPD via electronic mail.

Summary of adaptations (this paragraph summarizes the adaptations to this management action since 2009; it is provided to inform readers, it is not part of the management action). The word “historic” was added to the title of the management action to provide clarity. The text provides a description of reporting process that has been developed since the CMP was approved in 2009.

2022 CMP – EDUCATION CLUSTERS

The discussion of education and outreach are presented as “clusters” in this supplement. This is done to better capture, in one section, the diverse CMP management actions that address these two topics and to avoid repetition and inconsistency. Importantly, clustering reflects UH’s holistic approach to them and identifying opportunities for place-based and community-based programs that can amplify UH’s efforts and benefits to the community.

Example: Section 5.4.3 - Education Cluster (EO-2, EO-3, EO-5 and related)

- EO-2: Require orientation of all persons accessing the UH Management Areas in a manner consistent with the Maunakea Administrative Rules.
- EO-3: Consistent with the MEOP, continue to develop, update, and distribute materials explaining important aspects of Maunakea.
- EO-4: Consistent with the MEOP, implement the *Maunakea Sign Plan* (Office of Mauna Kea Management, February 2017) and modify, amend, and update it as warranted.
- EO-5: Consistent with the MEOP, develop interpretive themes and features.
- EO-6: Consistent with the MEOP, engage in educational partnerships with schools.
- EO-1: Maintain the Maunakea Education and Outreach Plan (Section 5.4.1). This management action concerns the modification, amendment, and/or updating of the MEOP when deemed appropriate. The MEOP provides guidance for all education activities.
- CR-3: Conduct Educational Effort to Raise Public Awareness of Importance of Preserving the Cultural Landscape (Section 3.4.3). This management action involves the cumulative implementation of all the education activities outlined in this section.
- NR-6: Educate People About Maunakea’s Natural Resources (Section 4.4.6). This management action involves the cumulative implementation of all the education activities outlined in this section.

- ACT-3: Maintain Ranger Program (Section 7.4.3). This management action involves the continuation of the Maunakea Rangers and is detailed in Subsection 5.4.3.4.
- P-4: Promote Manager and Permittee Awareness of Applicable Rules & Permit Requirements (Section 8.4.3).
- IM-2: Require Maintenance Worker Orientation (Section 9.4.2). This management action involves the cumulative implementation of all the education activities outlined in this section.
- C-7: Educate Construction Workers Regarding Historical and Cultural Significance (Section 10.4.7). This management action involves the cumulative implementation of all the education activities outlined in this section as they apply to personnel working on construction projects within the UH Maunakea Lands.
- C-8: Educate Construction Workers Regarding Environment, Ecology, and Natural Resources (Section 10.4.8). This management action involves the cumulative implementation of all the education activities outlined in this section as they apply to personnel working on construction projects within the UH Maunakea Lands.

ANNUAL REPORT TO BLNR

University of Hawai'i Hilo
Center for Maunakea Stewardship
Maunakea Comprehensive Management Plan
2023 Annual Progress Report

Prepared for
The Board of Land and Natural Resources
State of Hawai'i



View looking south towards Maunaloa from UH managed lands on Maunakea

Can be found on our website under the
Plans & Reports section

https://hilo.hawaii.edu/maunakea/stewardship/plans_reports

CMP Overview: Selected Management Action Status Updates		
CMP Management Objective	CMP Management Actions	Status
3.2 ...Identify, document the condition of, and protect cultural resources and historic properties in the UH Management Areas.	CR-10: Implement Historic Property Monitoring Plan (260 identified sites)	100 sites visited and documented (CY23). Note: there are 260 documented historic sites on UH's managed lands.
4.2 Increase understanding of the status of natural resources (biotic and abiotic) and identify threats to these resources to better protect and preserve unique geological features, ecosystem functions, subalpine and alpine habitats, and biological communities through adaptive management of stressors and threats.	NR-1 Limit threats to natural resources through management of activities and uses.	1. Vehicle and Equipment Inspections: ▪ 119 (CY23) ○ 4 were rejected due to ants
	NR-2 Implement the Maunakea Invasive Species Management Plan (C. Vanderwoude, February 2015) and modify, amend, and update it as warranted.	2. Arthropod Survey: ▪ 106 sites (CY23) ○ 196 Traps Set, 106 Wekiu Observed
	NR-5 Allow, and where possible facilitate, ecosystems to respond to climate change.	3. 286 new outplants for 2023 ▪ Māmane- 27 ▪ 'Āweoweo- 222 ▪ Stenogyne- 9 ▪ Pua Kala- 1 ▪ Pilo- 24 ▪ Ko'oKo'olau- 3
	NR-9 Increase native plant density and diversity through an outplanting program.	4. 13,200 lbs of weeds removed from our restoration area through volunteer programs and staff efforts.
	NR-10 Require mitigation measures in plans for new development.	5. Habitat monitoring research conducted in collaboration multiple academic institutions: ▪ Climate monitoring - UH Mānoa ▪ Permafrost monitoring - Planetary Science Institute ▪ Water Isotopes - UH Mānoa ▪ Health Impacts of Altitude – Univ of Montana ▪ Hydrogeology – UH Mānoa /Hilo Proposed
	NR-10 Require mitigation measures in plans for new development.	6. Partnership with NARS for propagation of silverswords for outplanting in surrounding habitat. Also, conduct monthly pictures of Lake Waiau for NAR and trash collection from Waiau Ahu by Rangers.
	NR-12 Plan and conduct habitat restoration activities, as needed.	7. Irrigation installation for greenhouse.
	NR-13 Increase communication, networking, and collaborative opportunities that support management and protection of natural resources.	
	NR-17 Conduct research to fill knowledge gaps that cannot be addressed through monitoring.	

MKSOA DRAFT STRATEGIC FRAMEWORK

MISSION

To protect Mauna Kea for future generations, by fostering a mutual stewardship paradigm in which the ecosystem of natural resources, cultural practices, education and science is in balance and synergy.

CORE VALUES

Mauna Aloha	Opu Kupuna	Holomua 'O Kelakela	Kanawai	'Ohana	Kuleana
<p>Responsibility to give back when doing activities on the Mauna while understanding that how spiritually & culturally significant Maunakea is.</p> <p>Working with KKM, for each project on the Mauna has a give back component.</p>	<p>Continually highlighting the importance and significance of Maunakea. Understanding & Perpetuating Native Hawaiian Culture</p> <p>Staff Training, improvement of displays at VIS, outreach, and how we conduct ourselves before doing stewardship activities</p>	<p>Adaptive Management & Stewardship</p> <p>Always looking to do what is best for the Mauna and for future generations.</p>	<p>Mindful of Laws of Nature and Human impact</p> <p>CMP guides us to minimize the effects of human impact on the environment. We are always working to make as little impact as possible.</p>	<p>Working together for what is best for the Mauna</p> <p>Supporting other sister agencies while even though not our jurisdiction so that the health and stewardship of the Mauna is always taken care of.</p>	<p>For the benefit of the Mauna work together in a way that is respectful to all</p> <p>Changing our approach to be more educational rather than enforcement focused. Instilling the concept to all who visit of how special Maunakea is and when you come to be respectful.</p>

GUIDING PRINCIPLES

