

Draft Environmental Assessment

Kapunakea Preserve
West Maui,
Natural Area Partnership Program

In accordance with Chapter 343, Hawai‘i Revised Statutes

Proposed by the
State of Hawaii
Department of Land & Natural Resources
The Nature Conservancy – Hawai‘i Operating Unit
October 2008

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I. Summary

Project Name:

Kapunakea Preserve Natural Area Partnership

Applicant:

State of Hawai‘i
 Department of Land and Natural Resources
 Division of Forestry and Wildlife
 1151 Punchbowl Street
 Honolulu, Hawai‘i 96813

The Nature Conservancy, Hawai‘i Operating Unit
 Maui Project Office
 P.O. Box 1716
 Makawao, Hawai‘i 96768

Approving Agency:

State of Hawai‘i Department of Land and Natural Resources

Anticipated Determination:

Finding of No Significant Impact (FONSI)

Project Location:

Kapunakea Preserve, 1,264 acres in the District of Lahaina, County of Maui, State of Hawai‘i

<u>Tax Map Key</u>	<u>Acreage</u>	<u>Zoning/Subzone</u>
4-4-07-01	1,014.6	Conservation/ Protective and Limited
4-4-07-02	74.0	Conservation/ Resource
4-4-07-07	175.0	Conservation/Protective
4-4-07-08	0.21	Conservation/Resource

Agencies Consulted During EA Preparation:

Federal:

- US Department of Interior/Haleakalā National Park
- Department of the Interior/US Geological Survey
- US Department of Agriculture/Soil Conservation Service-Maui District
- US Department of Agriculture/Natural Resource Conservation Service-Maui
- US Fish & Wildlife Service

State:

- Department of Hawaiian Homelands
- Department of Health- Environment Planning Office
- Directorate of Public Works-Environmental Division
- DLNR/ Aquatic Resources Division-Maui District
- DLNR/ Division of Forestry & Wildlife-Maui District
- DLNR/ Division of Land Management-Maui District
- DLNR/ Natural Areas Reserves Systems
- DLNR/ Office of Conservation and Environmental Affairs
- DLNR/ State Historic Preservation Division
- Environmental Protection Agency
- EPA -- PICO
- Hawai'i Department of Agriculture-Pesticide Branch
- Hawai'i Department of Business Economic Development & Tourism
- Lahaina Public Library
- Maui Island Burial Council
- National Marine Fisheries Service
- Office of Hawaiian Affairs – Land Management
- Research Corporation of the University of Hawai'i
- State Council on Hawaiian Heritage
- USDA Resources Conservation Service, State Conservationist

County:

- Maui County - Department of Water Supply
- Maui County - Planning Department
- Maui County - Department of Parks & Recreation
- Maui County - Office of the Mayor

Private:

- Bob Hobdy
- Central Maui Hawaiian Civic Club
- Conservation Council for Hawai'i
- Cultural Resources Commission
- Earth Justice Legal Defense Fund
- Historic Hawaii Foundation
- Kā'anapali Farm Services, Inc.
- Kā'anapali Land Development Corp.
- Kahu Charlie Maxwell
- Lahaina Resoration Fund
- Malama Honokōwai
- Maui Coffee Co.
- Maui Invasive Species Committee
- Maui Land and Pineapple Co.
- Maui Nui Botanical Gardens
- Native Hawaiian Plant Society
- Natural Resources Conservation Service
- Plant Extinction Prevention Program (PEPP)
- Queen Lili'uokalani Children's Center
- Royal Order of Kamehameha – Kahekili Chapter
- Sierra Club Legal Defense Fund
- UHM Environmental Center
- West Maui Mountains Watershed Partnership
- West Maui Soil & Water Conservation District

II. Project Description

Overview

Kapunakea Preserve was established in 1992 when Pioneer Mill Company, Limited, granted The Nature Conservancy (TNC) a perpetual conservation easement over 1,264 acres on West Maui. The current landowner is Kā'anapali Land Management Corp., successor in interest to Pioneer Mill Company, Limited. The conservation easement seeks to preserve and protect the natural, ecological and wildlife features of the property. The preserve's upper elevations are recognized as among the highest quality native areas in the state.

Kapunakea Preserve is adjacent to two other natural areas that are actively managed: Pu'u Kukui WMA (which is privately owned and part of the NAP program) and the Honokōwai section of the state West Maui Natural Area Reserve (NAR). In addition, the West Maui Mountains Watershed Partnership (WMMWP) is mandated to conserve and protect important forest lands of West Maui, which include Kapunakea Preserve, Pu'u Kukui and the West Maui NAR. These managed native forests and natural areas comprise more than 50,000 acres of contiguous, managed watershed.

Established in 1980, The Nature Conservancy of Hawai'i is a local affiliate of The Nature Conservancy, a leading international, nonprofit organization that preserves the plants, animals and natural communities representing the diversity of life on Earth by protecting the lands and waters they need to survive. The Conservancy has established a statewide system of preserves in Hawai'i totaling almost 40,000 acres. As a member of eight watershed partnerships, the Conservancy also works closely with public and private partners to help preserve nearly one million acres statewide. The Conservancy has also extended its work from the forests to the reefs and is engaged in marine conservation in the nearshore waters of the main Hawaiian Islands.

The State's Natural Area Partnership Program (NAPP) is an innovative program that aids private landowners in the management of their native ecosystems. NAPP provides matching funds (\$2 state to \$1 private) for the management of qualified private lands that have been permanently dedicated to conservation. Kapunakea was approved for NAPP funding in 1992, and soon thereafter TNCH implemented the management programs described in our initial plan, *Kapunakea Preserve FY1992 – FY1997 Long-Range Management Plan* (LRMP). In 1995, an environmental assessment was completed (*Final Environmental Assessment for Kapunakea Preserve Natural Area Partnership, 1995*). Subsequently, in 1997, NAPP funding for a new 6-year period was reauthorized following a renewal procedure which included the preparation of an updated plan (*Kapunakea Preserve FY1998 - FY2003 Long-Range Management Plan*) and another environmental assessment (*Final Environmental Assessment for Kapunakea Preserve Natural Area Partnership, 1997*). This plan was followed by the *Kapunakea Preserve FY2004 –FY2009 Long Range Management Plan*.

Presently, TNC is seeking reauthorization of NAPP funding for the next 6-year period for the programs described within this *Kapunakea Preserve FY2010 – FY2015 Long-Range Management Plan*. This plan continues the programs implemented under the previous plans and environmental assessments. This plan was prepared in compliance with the NAPP agreement between the state, TNC, and Hawai'i Administrative Rules Chapter 13-210.

We successfully implemented the resource management projects of the previous six-year long-range plan, as well as many others. See Table 1.

Table 1. Overview of Kapunakea Preserve Accomplishments by Programs
FY 2004 – FY 2008 (5 Years)

<i>Indicator</i>	<i>Measure of Success</i>
Ungulate Control	
1. Total animal catches	<ul style="list-style-type: none"> • 63 pigs removed from lower preserve
2. Total snares checked	<ul style="list-style-type: none"> • 607 snares checked semi-annually in 2005 increased to 859 snares checked semi-annually in 2008
3. Miles of fence maintained or replaced in Kapunakea	<ul style="list-style-type: none"> • 1.5 miles maintained routinely • All fences in Kapunakea inspected and reinforced where needed • Strategic fence at 4,200 ft. replaced in 2003 • 235 meters of apron has been added • New ingress areas were identified via eartagging and satellite telemetry
Invasive Plant, Invertebrate and Small Mammal Control	
1. Acres and total numbers of priority invasive plants treated or removed	<ul style="list-style-type: none"> • Thousands of <i>Tibouchina</i> plants have been removed • Hundreds of strawberry guava controlled • Florida blackberry and broomsedge controlled opportunistically
2. Number of discovered or reported incipient, invasive species eradicated (plant or mammal)	<ul style="list-style-type: none"> • 1 incipient <i>Panicum maximum</i> removed
Resource Monitoring	
1. Frequency of ungulate sign	<ul style="list-style-type: none"> • Transects are monitored annually • Transects stations above 3500' showed zero sign of ungulates
2. Acres surveyed for plant infestations	<ul style="list-style-type: none"> • Aerial surveys were conducted for <i>Tibouchina</i>, and along the Preserve's southern boundary for <i>Tibouchina</i>, <i>Psidium</i>, <i>Grevillia robusta</i> and <i>Juniperus bermudiana</i> • Weeds were monitored for and controlled at landing zones, campsites and upper trails • Priority weed maps have been updated annually
Rare Species Protection and Research	
1. Numbers of new rare taxa discovered and/or mapped	<ul style="list-style-type: none"> • Rare plant surveys were conducted annually (including both in-house and those conducted by Hawaii Biodiversity and Mapping Program and Plant Extinction Prevention Program (PEPP)) • Three new rare plants were documented for Kapunakea: <i>Cyrtandra filipes</i>, <i>Cyanea lobata</i>, and <i>Cyrtandra munroi</i> • New locations of eleven rare species were documented: <i>Alectryon macrococcus</i>, <i>Ranunculus mauiensis</i>, <i>Eurya sandwicensis</i>, <i>Ctenitis squamigera</i>, <i>Nothoestrum latifolium</i>, <i>Exocarpus gaudichaudii</i>, <i>Bobea sandwicensis</i>, <i>Alphitonia ponderosa</i>, <i>Colubrina oppositifolia</i>, and two <i>Auriculella</i> snails (species unknown)
2. Number of research projects supported in Kapunakea	<ul style="list-style-type: none"> • A 3-year study on avian dispersal patterns for pest tress <i>Juniperus bermudiana</i> and <i>Ficus</i> spp. in lower Kapunakea was completed • Access support was provided to PEPP for <i>Colubrina oppositifolia</i> scouting, and Maui Nui Botanical Gardens for <i>Colubrina oppositifolia</i> air layering trials • Access was granted to PEPP for independent rare plant surveys

Over the next six years TNC will continue to seek outside assistance to carry out effective management at Kapunakea. During the past 2 years, the West Maui Mountains Watershed Partnership (WMMWP) helped to manage Kapunakea under contract to TNC. WMMWP is mandated to conserve and protect 50,000 acres of important forest lands of West Maui, which include Kapunakea preserve. Under a sub-contract with WMMWP, we are able to deepen our effective removal of ungulates (our program's primary goal) through increased scouting and regular checks and maintenance of fences and snares. WMMWP considers continuation of Kapunakea's management programs (particularly ungulate removal) key to the viability of the West Maui Mountains. As such, TNC seeks to continue to subcontract with WMMWP to remove pigs and monitor for their presence, conduct an annual aerial weed survey, maintain infrastructure, and provide occasional access to researchers. In addition, TNC, at its own expense, contracted a professional animal control company to conduct intensive ungulate removal in Kapunakea in FY 08. These contract hunters successfully removed 16 pigs at Kapunakea this past year and identified several potential ingress areas through the lower boundary fence. TNCH will continue to pursue opportunities for contract work as opportunities arise.

We plan to accomplish the following goals and objectives over the next six years:

Ungulate Control:

Goal: Remove all ungulates and prevent future invasion.

Activities:

- Complete two check cycles of snares throughout the lower, mid and upper elevations of the preserve.
- Complete two additional check cycles of snares in the lower elevations of the preserve.
- Complete one aerial and one ground scout to determine whether pigs are present in areas of the preserve not currently targeted for active animal control; in particular to determine if there is ingress or egress of pigs across Kapunakea's steep, natural barriers.
- Conduct monthly inspections and repairs of Kapunakea's fences, making repairs as necessary.
- Map and document breaches and record time between observed breach and repair.
- Establish 2-4 traps adjacent to lower boundary fence to reduce ungulate pressure.

Invasive Plant Control:

Goal: Remove habitat-modifying weeds from high-quality native habitats; prevent introduction or spread of problem weeds.

Activities:

- Continue treatment of top two habitat-modifying weeds (*Tibouchina* and Strawberry guava).
- Monitor weeds as needed according to management priorities.
- Respond to new weed threats and map efforts.
- Update and maintain priority weed maps semi-annually.

Small Mammal Control

Goal: Increase our understanding of threats posed by small mammals; reduce their negative impact where possible.

Activities:

- Continue to support studies into aerial application of rodenticides.
- Support other scientific research into effects of small mammals and their effective control.

Resource Monitoring

Goal: To track biological and physical resources of the preserve and evaluate changes in these resources over time, to identify new threats before they become established, and to promote research that guides management programs.

Activities:

- Reassess key vegetation monitoring plots. (once over the 6 year period)
- Monitor and maintain threat monitoring transects once per year.
- Provide logistical support to researchers.

Rare Species Protection and Research

Goal: Prevent the extinction of rare species in the preserve.

Activities:

- Continue to support PEPP in search and assessment of rare species populations to determine protection needs and to reduce threats.
- Maintain current maps of rare species populations.

Community Outreach

Goal: To educate, empower, and engage the community in the preservation of their natural and cultural heritage from summit to sea.

Activities:

- Present slide shows and talks as requested by community and school groups.
- Lead special hikes for targeted community members.

Watershed Partnerships

Goal: Assist the long-term effective management of the native ecosystems of West Maui by the West Maui Mountains Watershed Partnership (WMMWP).

Activities:

- Participate in partnership meetings to help set priorities for the WMMWP.
- Assist the WMMWP in accomplishing fundraising and management priorities.

Description of the Affected Environment

Flora and Fauna

Kapunakea contains 11 native-dominated natural communities, ranging from lowland shrublands to montane forests and bogs, including the rare 'Ōhi'a Mixed Montane Bog (Figure 1, Appendix 1). Four of the communities are not found in the nearby West Maui NAR, most notably Koa/'Ōhi'a (*Acacia koa*/*Metrosideros polymorpha*) Lowland Mesic Forest and Lama/'Ōhi'a (*Diospyros sandwicensis*/*Metrosideros polymorpha*) Lowland Mesic Forest. Figure 1 depicts the vegetation communities present in Kapunakea Preserve, established through GAP analysis.

Kapunakea protects at least 34 rare plants (Appendix 2). At least eight of Kapunakea’s rare plants have not been seen in the NAR. Four native forest birds are found in Kapunakea: ‘apapane, ‘i‘iwi, ‘amakihi, and pueo. ‘Ua‘u have also been heard there. Populations of four species of rare Hawaiian tree snails have recently been documented at Kapunakea: *Partulina perdix*, *P. tappaiana*, *P. crocea*, and *Perdicella kuhnsi* (Appendix 3). These snails probably were once widespread and abundant on Maui, but in many areas their numbers have declined precipitously in this century due to habitat destruction, collection, and the depredation by introduced animals. A number of other snails also occur at Kapunakea, including tornatellinines and species of *Auriculella*, *Succinea*, and *Philonesia*.

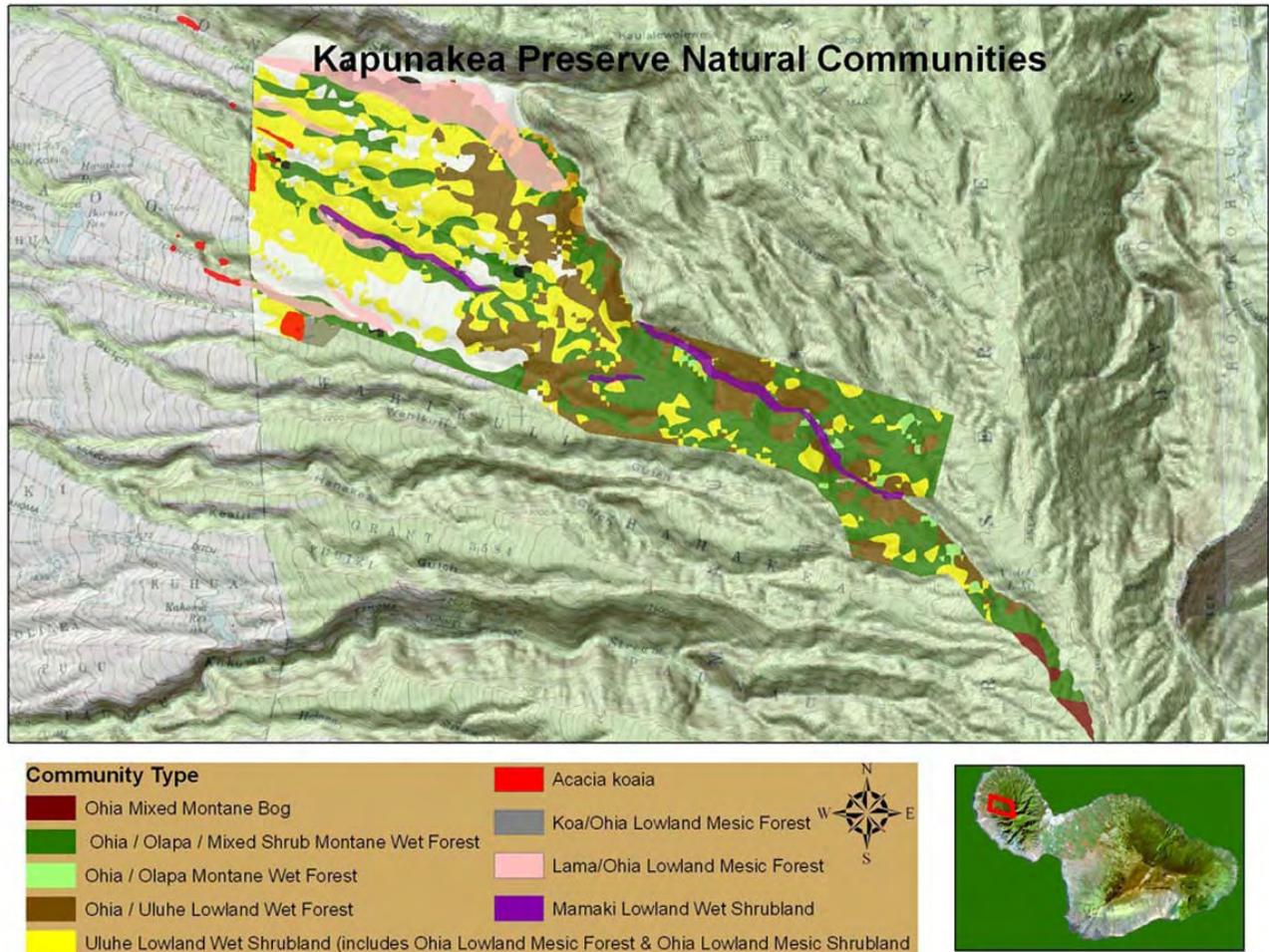


Figure 1. Kapunakea Preserve natural communities.

Assessment of Impacts on Cultural Sites and Practices at Kapunakea Preserve, Maui (see appendix 5)

Cultural Impact Assessments (CIA) are a recent additional requirement of the EA process, focusing on both documented and potential impacts of proposed actions on cultural sites and traditional practices exercised at a place by the communities associated with a place.

In ascertaining the potential impacts of its land management activities on cultural sites and practices, the Conservancy consults regularly with appropriate authorities, reviews published and unpublished literature, and takes advantage of its cultural expertise on staff, which in 2001 included Iokepa Naeole (a founding member of Na Kūkulu, Hawaiian cultural practitioners, and as of 2008 is no longer in the direct employ of The Nature Conservancy, but remains an important advisor) and Dr. Sam ‘Ohukani‘ōhi‘a Gon III (a cultural practitioner and researcher, now serving as Senior Scientist and Cultural Advisor of The Nature Conservancy).

Extensive original background research for Kapunakea was conducted, including the entire period of human occupation in the area from traditional Hawaiian times to the early Twentieth Century. The major task of the background research was a literature review which included a review of Native Hawaiian historical accounts, legends, and traditions, Māhele documents, previous oral history projects, and previous archaeological studies. Research also included examination of the maps, historical photos, and other documents on file at the Hawai‘i State Archives, the Bernice P. Bishop Museum, the State Historic Preservation Division, the State Survey Office, and the Hamilton Graduate Library at the University of Hawai‘i at Mānoa.

Hawaiian language newspapers electronically rendered in the digital on-line resource Ulukau.org, were searched for relevant entries based on the place names associated with the Kapunakea Preserve: Kapunakea, Hanaka‘ō‘ō, Honokōwai, Kapāloa, and spelling variants for these places (e.g., Hanaka‘ō‘ō), bearing in mind that newspapers of the time did not typically include diacritical marks. Only pertinent data describing the upland portions of these lands were considered in the impact assessment. It is noted later that the place name Kapunakea is associated with both a small coastal section north of Lahaina, and a small upland section relevant to the Kapunakea Preserve. Activities clearly referring to the coastal Kapunakea were not included in the assessment of history and impacts. Linked references to the two Kapunakea, however, were applicable and included.

As a partner in the West Maui Mountains Watershed Partnership (WMMWP), the Conservancy submitted in 2001, an Environmental Assessment (EA) for a Watershed Protection Project that encompasses the Kapunakea Preserve and an additional 50,000 acres in the West Maui Mountains (i.e. *Final Environmental Assessment for the West Maui Mountains Watershed Protection Project*, Feb. 2001). That EA received a "Finding of No Significant Impact" in 2001; and consequently, the project was officially allowed to proceed. Because the EA for the Watershed Protection Project covered an area that includes the Kapunakea Preserve, herein the cultural study of the EA is cited extensively as a significant source for identifying cultural sites and practices.

To assess the Watershed Protection Project's potential effect on archaeological sites and cultural practices, the WMMWP conducted individual and group interviews with kūpuna on Maui (WMMWP 2001). Additional information was obtained from *Sites of Maui* (Sterling 1998). In preparing *Sites of Maui* the author, Elspeth P. Sterling, researched Hawaiian and English written records of Maui, talked with kūpuna, and traveled the island with anthropologists and local informants to rediscover the sites named in documents and in tradition. Essentially, *Sites of Maui* is a compendium of Maui ethnography, anthropology, and history that was scattered throughout Hawaiian-language newspapers, hard-to-find ethnographic classics such as Abraham Fornander's *Collection of Hawaiian Antiquities and Folklore*, and field notes, manuscripts, and oral recordings in the Bishop Museum Archives and other Hawaiian collections. Its value as a compendium of site-related information on cultural sites and practices is enormous. It represents oral history from kūpuna, many of which have now passed.

To further determine the effect of the Conservancy's land management activities at Kapunakea Preserve, three recognized cultural practitioners from the West Maui community were taken on site visits by Conservancy staff in fiscal year 2002. They were Hōkūlani Holt-Padilla from the Maui Arts and Cultural Center, Ke'eumoku Kapu of Kaua'ula Valley, and Akoni Akana, Director of the Friends of Moku'ula. Each was taken by helicopter to the intact bogs of Kapunakea where a traditional request for entry into the forest was performed before a short walk in the area. Later they were taken to the Conservancy's mid elevation camp at 3,200 feet. During these visits the cultural practitioners were able to meet Conservancy management crews, learn about the weed and animal control programs in place, and were introduced to a few of the plants and animals being protected in the Preserve.

The 1,264-acre Kapunakea Preserve encompasses portions of three traditional Hawaiian ahupua'a (land divisions): Honokōwai, Hanaka'ō'ō, and Kapunakea (Donham 1994). The northern half of the Preserve, including Honokōwai Valley and Kapāloa Valley, is in the ahupua'a of Honokōwai. The southern ridge area is within the ahupua'a of Hanaka'ō'ō. And, a small portion at the southwestern edge of the Preserve is within the ahupua'a of Kapunakea. It is important to note here, that there are two disjunct pieces of land that are named Kapunakea in the district of Lahaina. The upland piece is that which is partly included in the Kapunakea Preserve of its namesake. The other piece of land named Kapunakea is a small coastal piece further south, but north of Lahaina Harbor. In researching land use, it was important to ascertain if references to Kapunakea involved the upland piece, or the coastal piece. With one exception, references to Kapunakea in the State Archives referring to residence,

These ahupua'a lie on the boundary of the moku (districts) of Kā'anapali and Lahaina, with Honokōwai in the ancient northern moku of Kā'anapali, and Hanaka'ō'ō and Kapunakea falling within the western moku of Lahaina. The furthest mauka (inland) extent of the Kapunakea Preserve lies at the juncture of the three ancient moku of the West Maui Mountains and overlooks the eastern moku of Wailuku. Various revisions in the districting boundaries (e.g., via the Māhele of 1848, Civil Code of 1859, Session Laws of 1909, and its 1932 revision) have brought all of the ahupua'a of the Kapunakea Preserve into the modern district of Lahaina (see Sterling 1998).

Management Considerations

1. The primary strategy for protection of Kapunakea is to prevent the further introduction and/or spread of destructive alien species. Special care must be taken to avoid negative side effects of management activities. For example, trails and management activities are designed to prevent further weed and ungulate invasion. This strategy requires helicopter access to most parts of the preserve. Interpretive and educational uses are limited in scope. Guidelines are followed to minimize impacts such as trampling and weed dispersal.
2. The preserve is bounded on the west (lowland) side by private agricultural lands. Activities related to agricultural production (large, heavily-loaded trucks, agricultural burning, etc.) pose a risk to preserve users. As a result, public access is limited, and we carefully coordinate our management and interpretive activities with work in adjacent agricultural areas.
3. Kapunakea is remote and rugged. Given limited resources, the entire preserve cannot be managed equally. Management is concentrated at the most urgent threats (e.g. halting pig ingress), and in areas that contain special plants, animals, and native natural communities (e.g. the rare montane bog community).
4. Kapunakea Preserve is adjacent to two areas that are also managed to protect natural resources: Pu‘u Kukui WMA (privately owned) and the Honokōwai section of the state West Maui NAR. TNC works closely with both Maui Land and Pineapple Co., managers of Pu‘u Kukui WMA, and with the State Division of Forestry and Wildlife, who are responsible for management of the NAR. Several agreements are used to coordinate management and sharing of staff, equipment, and expertise in order to maximize management efficiency.

Management Units

Kapunakea is managed as five units (Figure 2) defined by topographic boundaries, similarity of natural community types, and threats.

1. Unit 1 consists of the lowland (up to 3,000 feet elevation) portion of the preserve that is closest to Kapāloa Stream. It is primarily comprised of ‘Ōhi‘a Lowland Wet Forest and Uluhe (*Dicranopteris linearis*) Lowland Wet Shrubland. Prior to our management efforts, this unit showed high levels of pig activity. Activity has been significantly reduced by control measures that must be maintained to keep activity low.
2. Unit 2 encompasses the remainder of the preserve’s lowland elevations. It contains five native communities, and non-native vegetation in the gulch bottoms. Because *Tibouchina* and strawberry guava are prevalent throughout the unit, we aim to prevent their spread into other units, rather than eliminate them from Unit 2. Pig activity, although high during the initial phases of ungulate control, has been reduced substantially.
3. Unit 3 comprises the majority of the preserve’s mid-elevations (3,000 – 4,000 feet) and follows Kapāloa Stream along its northeast boundary. The four montane communities in Unit 3 are dominated by Uluhe or ‘Ōhi‘a; Māmaki (*Pipturus albidus*) Lowland Wet Shrubland occurs along the streambed. The Uluhe- and ‘Ōhi‘a-dominated communities are intact above 3,400 feet, with minimal weed problems. Our management focus in this unit is to eliminate ungulates and control weed invasions.

4. Unit 4 begins on the east side of Kapāloa Stream, and continues to the preserve's eastern boundary. The upper elevations in this unit must be reached by helicopter, due to the steep gulch walls. Management focuses on preventing new invasions.
5. Unit 5, encompassing the highest elevations of the preserve, is Kapunakea's most pristine unit. Initial survey data and more recent monitoring results have shown that this area contains only a few scattered alien plants (including *Tibouchina*). The management priority is to remove threats from this area before they damage the rare 'Ōhi'a bogs. Access is by helicopter only. Travel is conducted from the upper elevations down to avoid transport of weeds that occur in lower elevations.

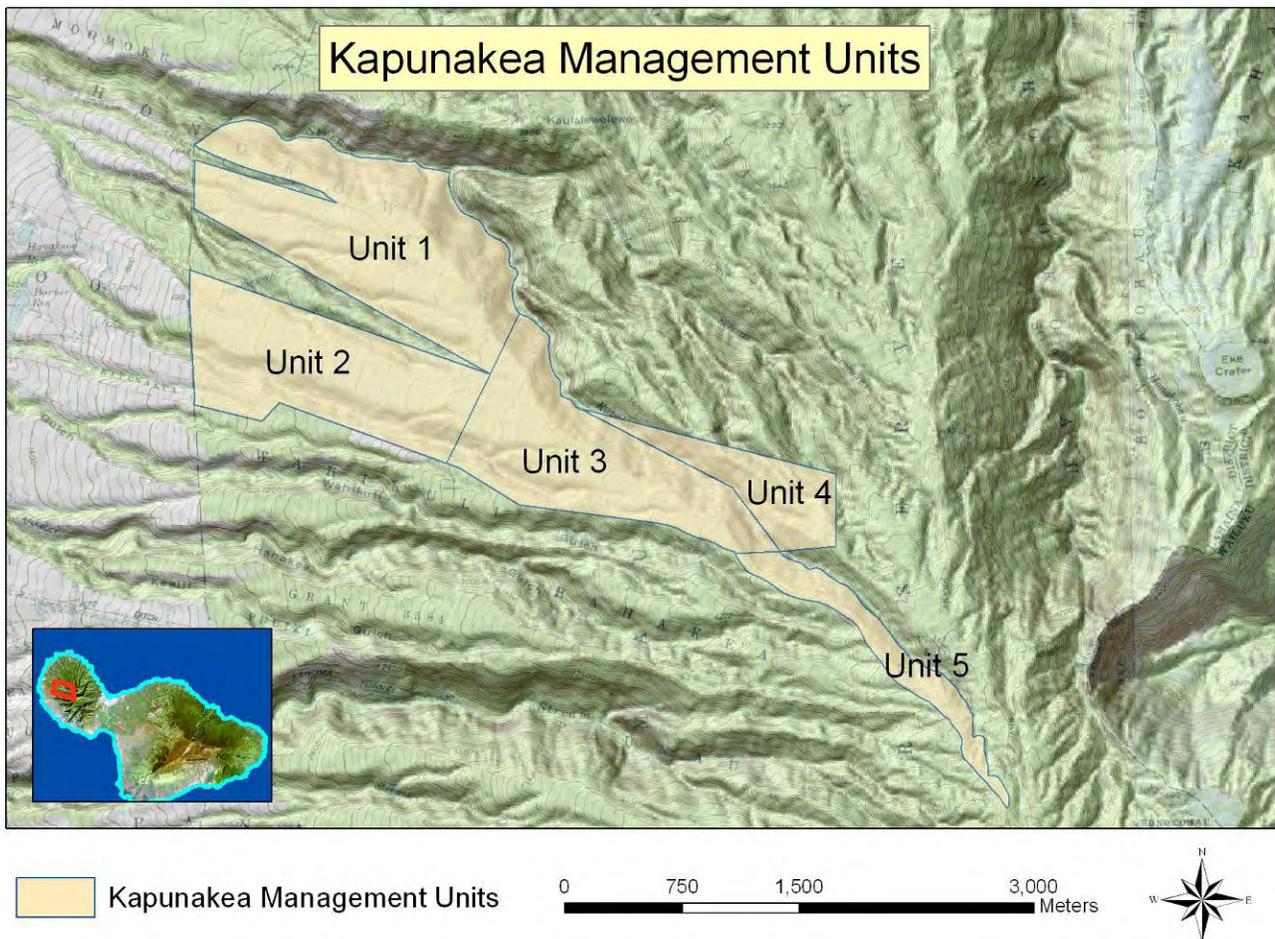


Figure 2. Kapunakea Preserve boundaries and management units.

Description of Actions

Although the following management programs are described separately, they form an integrated management approach. For each program listed in the following section, we have indicated a major goal and described the management methods chosen. Also included are highlights of past and current achievements, along with key management issues. Finally, objectives and costs for FY2010–FY2015 are listed. Staff time and effort, along with equipment expenses, are included separately within the ‘Personnel, Equipment, and Facilities’ program section.

Program 1: Non-native Species Control

A. Ungulate Control

Program Goal

Remove all ungulates and prevent future invasion.

Program Description

The elimination of ungulates in Kapunakea Preserve and on adjacent partnership lands continues to be our highest priority. Ungulate damage has been substantially reduced since 1995, especially in upper elevation areas. However, it is known that pigs continue to find their way into the preserve from adjacent lands. During 2008, 16 animals were removed from Kapunakea by contract hunters at TNC’s expense. However, as ungulates reappear in the preserve (this is very likely based on past history and reliance on strategic fencing), their control becomes the highest priority. We will continue scouting and removal efforts as needed. Some resources may be shifted to weed control should we deem ungulate levels low enough to justify this shift. As needed, we will employ other animal control techniques as they become available and feasible for preserve management. This could again include hunting with dogs in some areas either by contractor or staff. An example of another control technique is trapping, particularly adjacent to the lower boundary fence to reduce ungulate pressure to upper areas.

The current ungulate control program utilizes a combination of fencing, hunting (primarily contract hunting), and snaring to bring pig populations down to zero as rapidly as possible and prevent them from re-establishing. The fence along the lower boundary of the preserve was replaced in several phases between FY1993 and FY1995. This lower boundary fence replaced an aging Forest Reserve boundary fence in existence for many decades. This fence is key to preventing ungulate ingress into the Preserve; as such it is likely that ongoing maintenance and possible additions to this lower boundary fence will be necessary during the next six years. A short strategic fence initially constructed in FY1993 at 4,200 feet was replaced in 2003 to prevent pigs from moving into the bog areas. The WMMWP fencing crew recently completed a boundary fence on adjacent lands. We expect this approximately half-mile fence at Hāhākea to further prevent pig ingress into Kapunakea from neighboring lands. In the coming years we may need to continue constructing short strategic fences at possible points of pig ingress. In the near future, we may need to add fencing along the boundary separating Unit 3 above from Units 1 and 2 below. If ungulates continue to persist in lower elevation areas, this fence would be instrumental in keeping ungulates out of more pristine, higher elevation areas. Figure 3 depicts current and proposed fences in Kapunakea Preserve and on adjacent lands. We propose to make this decision in 2010 or 2011 after we have evaluated the effectiveness of recent improvements to the lower boundary fence.

Snaring is still the most effective and feasible technique for controlling pigs in areas too remote, rugged, and/or fragile for frequent hunting, and where hunting cannot remove low-density pig populations from sensitive sites. Until an effective alternative can be found, snares will continue to be placed in pig-damaged areas. Additionally, if warranted by high levels of pig activity, we will snare other areas of the preserve (and other strategic areas). All snares are checked semi-annually, and groups of snares are conspicuously marked in the field.

In the past few years, axis deer (*Axis axis*) have greatly expanded their range on Maui to include West Maui areas near Ukumehame, Kapalua, and Kahakuloa. Control efforts for axis deer may be needed in the near future to protect the preserve.

Following standards implemented in 1993 (Dunn 1992), we have established a system of transects that extend the entire length of the preserve. (These are referred to throughout this document as resource/threat monitoring transects.) This system replaced a network of 500-meter-long ungulate and weed monitoring transects. We will gather data on animal activity and weed presence along the resource/threat monitoring transects once every year. We will also continue to record incidental observations of small mammal (cat, dog and mongoose) sign, and begin control as necessary.

As part of our routine management program, we will continue to: 1) survey for axis deer and goats on West Maui during routine helicopter operations; 2) assist the WMMWP and neighboring land managers with ungulate control efforts; and 3) participate as members of the Maui Invasive Species Committee (MISC).

Activities

Years 1-6 (FY2010-15)

- Complete two check cycles of snares throughout the lower, mid and upper elevations of the preserve.
- Complete two additional check cycles of snares in the lower elevations of the preserve.
- Implement contract hunting in key areas if needed.
- Complete one aerial and one ground scout to determine whether pigs are present in areas of the preserve not currently targeted for active animal control; in particular to determine if there is ingress or egress of pigs across Kapunakea's steep, natural barriers.
- Conduct monthly inspections and repairs of Kapunakea's fences, making repairs as necessary.
- Map and document breaches and record time between observed breach and repair.
- In 2010 – 2011, determine need for a ¾ mile strategic fence at 3,000 ft. elevation and construct if needed (Unit 3 lower boundary).
- Establish and maintain 2-4 traps adjacent to lower boundary fence to reduce ungulate pressure.

Kapunakea Preserve & Adjacent Fence Locations

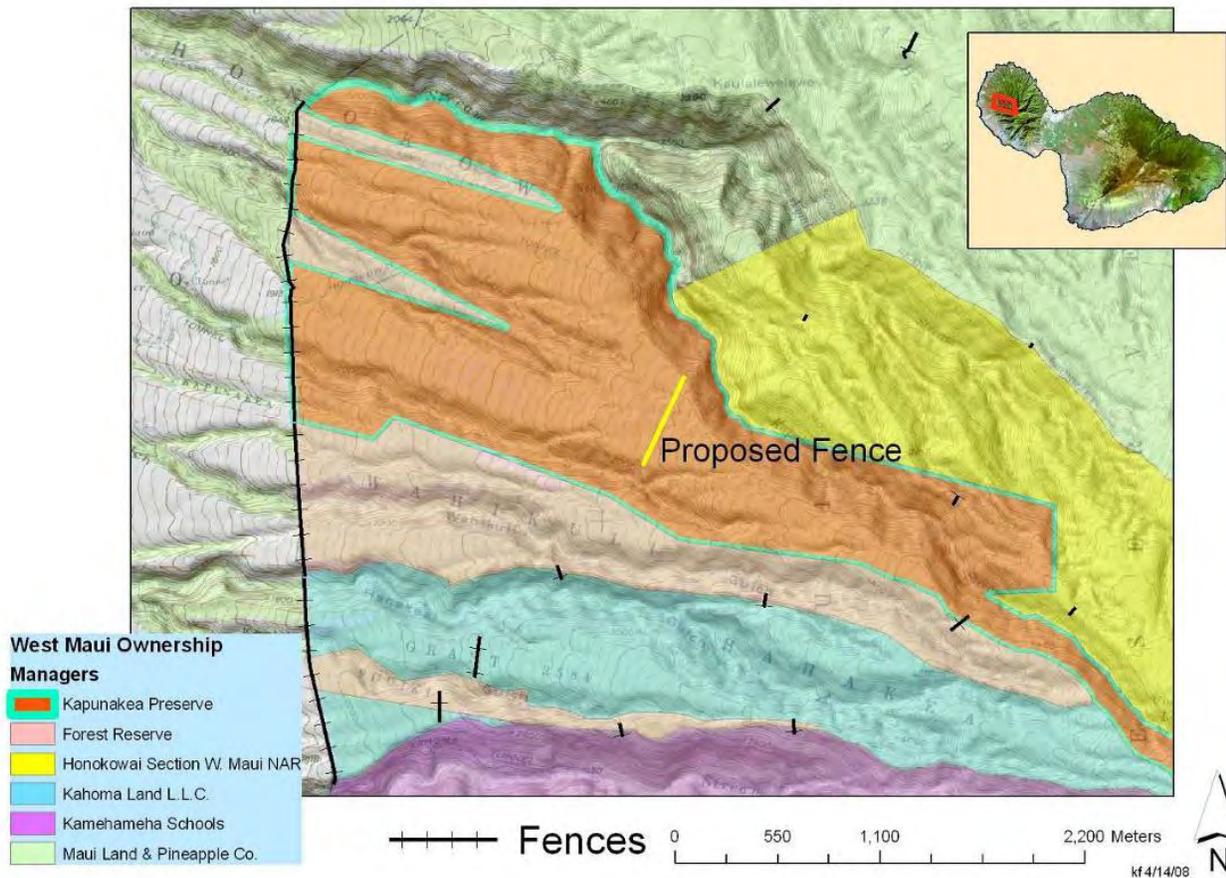


Figure 3. Existing and proposed fences at Kapunakea Preserve and surrounding lands.

This program represents an estimated 70% of the overall effort and budget in this long range management plan.

B. Invasive Plant Control

Program Goal

Remove habitat-modifying weeds from high-quality native habitats; prevent introduction or spread of problem weeds.

Program Description

The most important aspects of our weed control program are to control established weeds in intact native communities, and to prevent the introduction of new species of alien plants. (Elimination of ungulates is believed to be one of the most effective means of controlling the introduction and spread of habitat-modifying weeds.) In some cases, when weeds are considered a direct threat to rare plant populations occurring in alien-dominant habitat, localized control actions may be taken.

We will continue to enforce strict procedures to remove weed seeds from equipment and clothing before people enter the preserve. Helicopter flights will originate from areas free of aggressive weeds, and all equipment and clothing will be inspected and cleaned. Of the alien plants already established in the preserve, many are shade intolerant and pose no major problem if the native forest canopy and ground cover remain intact. There are other alien plants, however, that displace native vegetation over large areas; these habitat-modifying plants are considered 'Priority Weeds' for management (Table 2). Based upon 10 years of experience with the dynamics of our weed populations, we revised our list of priority weeds in FY2003. Due to limitations in staff resources needed to combat all of the priority weeds, this list will be revised to reflect only the species that are most pressing in terms of direct threats.

We will continue to control weeds manually (by pulling or cutting), chemically (using herbicide), or with a combination of manual and chemical control methods. Herbicide use is limited, and in full compliance with the State of Hawai'i Department of Agriculture (HDOA) Pesticide Enforcement Division. (Weed control staff are also certified through HDOA's Pesticide Enforcement Division.) All herbicide use is in accordance with the product label and recorded in detail for reference and efficacy monitoring.

As the project evolves, we may employ other techniques or tools for weed control as they are developed. Once again, no new application methodology will be employed without full compliance with HDOA.

Our weeding and non-native tree removal activities most likely will not result in significant ground disturbance. We may also conduct revegetation of damaged/weed controlled areas to prevent erosion or weed recolonization. We also will cooperate with DOCARE in marijuana control as needed.

Target Species:

Tibouchina herbacea is rapidly expanding its range over West Maui. It has become widely established in the lower half of the preserve over the last 15 years. People, pigs, and wind seem to be the primary vectors of this habitat-modifying weed. Due to our diligence at scouting for and treating *Tibouchina* above 3,200 feet, we have minimized its establishment at higher elevations, despite our expectation that the infestations would explode beyond our control. We will continue to track the Department of Agriculture's success in identifying safe biocontrol agents for *Tibouchina* and, upon their demonstrated effectiveness, we will seek in-house approval to release them on TNC preserves. Dr. Tracy Johnson (Research Entomologist), who coordinates the biocontrol program at the Forest Service's quarantine facility in Volcano, has informed us that one potentially promising candidate has been identified, a beetle (*Syphrea uberabensis*) that consumes the roots and leaves of *Tibouchina herbacea*. Presently, a petition for release should be filed with HDOA in 2008, with possible release at a Maui site for 2009 or 2010. TNC will be involved in post-release monitoring once this occurs.

In the past 15 years, we have halted the spread of strawberry guava (*Psidium cattleianum*) in lower Unit 3 by treating thousands of trees with herbicide, and pulling thousands of seedlings. As feral pigs are a primary source for spreading strawberry guava, and we have significantly reduced pig numbers, the spread has slowed considerably. We continue to scout for this pest tree in critical areas above 3,200 feet, where the spread is very limited. A potential biocontrol agent, a guava leaf gall (*Tectococcus* spp.) will be petitioned for release on Hawaii Island this year, with hopes of introduction to Maui in 2010. If released, TNC will assist with post-release monitoring.

Florida blackberry (*Rubus argutus*) is widespread and continues to spread (primarily via birds), although our prior treatment of trailside plants has prevented it from gaining density along those routes. Blackberry

continues to dominate habitat along steep gulches, especially pig-disturbed terraces, where chemical control is impractical.

A tall thatch grass, *Andropogon virginicus* (Broomsedge), has recently presented Kapunakea with new challenges. Besides being a habitat-modifying plant, this grass also poses a serious wildfire threat as a medium fuel during drought periods. Mechanical and chemical control efforts have worked to limit the dominance of this weed along trails, camps, and especially landing zones.

We have had success at containing and shrinking populations of Hilo grass (*Paspalum conjugatum*) along strategic trails; future efforts will focus on maintaining that status for this shade-tolerant grass.

We routinely control specific priority weeds along trails, campsites, and landing zones above 3,200 feet elevation, limiting current infestations in otherwise intact forest or shrubland. This also serves to minimize spread of priority weeds to new places during other preserve activities.

As part of our routine management program, we will continue to: 1) monitor for and control new weeds at landing zones, campsites, and upper trails; 2) train staff in the proper handling and application of herbicides; 3) participate as a member of the Maui Invasive Species Committee; 4) update aerial survey and range maps for *Tibouchina* and guava; and 5) cooperate with DOCARE in marijuana control as needed. In the future, it is likely that we will be employing new passive technologies like remote sensing or high resolution aerial photography for weed mapping.

Table 2. Priority Weed Species for Management in Kapunakea Preserve

Rank	Scientific Name	Common Name
1	<i>Tibouchina herbacea</i>	Tibouchina
2	<i>Rubus argutus</i>	Blackberry
3	<i>Psidium cattleianum</i>	Strawberry guava (waiawī)
4	<i>Paspalum conjugatum</i>	Hilo grass
5	<i>Rubus rosifolius</i>	Thimbleberry
6	<i>Andropogon virginicus</i>	Broomsedge
7	<i>Passiflora suberosa</i>	Passiflora
8	<i>Melinis minutiflora</i>	Molasses grass
Other Important Pest Species:		
-	<i>Ficus</i> spp.	Banyan
-	<i>Buddleia asiatica</i>	Butterfly bush
-	<i>Juniperus bermudiana</i>	Juniper
-	<i>Grevillea robusta</i>	Silk oak
-	<i>Setaria gracilis</i>	Yellow foxtail
-	<i>Holcus lanatus</i>	Velvet grass
-	<i>Axonopus fissifolius</i>	Carpet grass
-	<i>Juncus planifolius</i>	Bog rush
-	<i>Psidium guajava</i>	Guava
-	<i>Hedychium coronarium</i>	White ginger

Activities

Years 1-6 (FY2010-15)

- Continue treatment of top habitat-modifying weeds above 3200' (especially *Tibouchina* and Strawberry guava).
- Monitor weeds as needed according to management priorities.
- Respond to new weed threats and map efforts.
- Update and maintain priority weed maps semi-annually.
- Carryout localized weed control in landing zones, camps, key microhabitats and trails.
- Follow strict protocols prevent inadvertent introduction and spread of priority weeds.

This program represents an estimated 15% of the overall effort and budget in this long range management plan.

C. Small Mammal Control

Program Goal

Increase our understanding of threats posed by small mammals; reduce their negative impact where possible.

Program Description

While it is recognized that mongoose and feral cats could pose a threat to native passerines and nesting seabirds, depredation of native land snails by rats is the most pressing impact from small mammals at Kapunakea. Prior research and management attempts during the last 12 years have shown intensive rat control to exceed realistic budgets in terms of staff and logistics. In addition the long-term impact from maintaining intensive rat trapping can cause significant damage to native plant communities. However, TNC supports a long-term program aiming at protecting larger landscapes from small mammal depredation and has contributed toward trials that may result in the aerial application of rodenticide.

Activities

Years 1-6 (FY2010-15)

- Continue to support studies into aerial application of rodenticides.
- Support other scientific research into effects of small mammals and their effective control.

This program represents an estimated 1% of the overall effort and budget in this long range management plan.

Program 2: Resource Monitoring

Program Goal

To track biological and physical resources of the preserve and evaluate changes in these resources over time, to identify new threats before they become established, and to promote research that guides management programs.

Program Description

Resource monitoring differs from threat monitoring in that its purpose is to document and quantify natural resources (vegetation, birds, and invertebrates) and track them over time, identifying trends. Accurately quantifying changes in natural resources provides land managers with the information needed to determine the efficacy of past management programs and to plan future research and management actions in Kapunakea. We have established a network of monitoring plots to quantify and better understand Kapunakea's baseline vegetation.

We completed a monitoring report for Kapunakea, *Long-Term Biological Threat and Resource Monitoring, Kapunakea Preserve, West Maui*, in 1995. It consists of four parts: vegetation monitoring, rare plant monitoring, pest plant monitoring and feral ungulate monitoring. Our monitoring transects include: 1) 10,000 meters of permanent belt transects for monitoring the distribution, frequency, and relative abundance of feral ungulates and alien plant species, and 2) 41 permanent, 250 square meter plots for obtaining in-depth quantitative data on forest vegetation. In FY2010, we plan to contract with a qualified botanist to complete one vegetation reassessment and survey and compare results with those completed in 1995. The need for additional resource monitoring will be decided once we have the results of this contract.

We may employ new passive monitoring technologies such as remote sensing, high resolution aerial photography for weed mapping, and remote motion-sensored photo monitoring for ungulates and traps. Data collection may include incidental ground disturbance, depending on which monitoring tool is employed. Land uses may include leaving cameras and other monitoring and communication gadgets in the field. Other monitoring tools may be employed as they are developed and become available.

Bird surveys were conducted during various years along the same transects by observers trained in the U.S. Fish and Wildlife Service's Hawai'i Forest Bird Survey methodology. The purpose of these surveys is to document the relative abundance of all bird species in the forest. In the future, we will conduct bird surveys only during the state's routine bird surveys (every 5 years).

Activities

Year 1 (FY2010)

- Monitor and maintain threat monitoring transects once per year.
- Provide logistical support to researchers.
- Complete one vegetation reassessment and survey and compare results with those completed in 1995.

Year 2-6 (FY2011-15)

- Monitor and maintain threat monitoring transects once per year.
- Provide logistical support to researchers.

This program represents an estimated 3% of the overall effort and budget in this long range management plan.

Program 3: Rare Species Protection and Research

Program Goal

Prevent the extinction of rare species in the preserve.

Program Description

The preserve is home to at least 34 species of rare plants, including 9 that are listed as endangered (Appendix 2). TNC uses data from the U.S. Fish and Wildlife Service, the agency responsible for administering the federal Endangered Species Act, to identify rare and endangered species and those that are listed as “candidate” or “special concern” species. In addition, data compiled by the Hawaii Biodiversity and Mapping Program (HBMP, formally the Hawai‘i Natural Heritage Program) is assessed to further identify rare species in Hawaii (Appendix 2). Four native forest birds are found in Kapunakea: ‘apapane, ‘i‘iwi, ‘amakihi, and pueo. ‘Ua‘u have also been heard there. Populations of four species of rare Hawaiian tree snails have recently been documented at Kapunakea: *Partulina perdix*, *P. tappaniana*, *P. crocea*, and *Perdicella kuhnsi* (Appendix 3). These snails probably were once widespread and abundant on Maui, but in many areas their numbers have declined precipitously in this century due to habitat destruction, collection, and the depredations of introduced animals. A number of other snails also occur at Kapunakea, including tornatellinines and species of *Auriculella*, *Succinea*, and *Philonesia*.

Our primary management goal is to protect habitat essential to the majority of the preserve’s native plants and animals. This protection will be achieved, in large part, by continuing to eliminate pigs and control weeds. However, we will continue to assess other threats to the preserve’s rarest species and to implement control measures for these threats as appropriate.

Formal surveys were conducted annually at Kapunakea by botanists from the HBMP. Their reports and accompanying maps are kept in Maui Field Office files. These surveys have yielded some significant results. For example, more than three-fourths of the endangered māhoe tree population (*Alectryon macrococcus* var. *macrococcus*) known on West Maui are concentrated in Kapunakea Preserve. The Plant Extinction Prevention Program (PEPP), administered through the Pacific Cooperative Studies Unit (PCSU) and coordinated by DOFAW, is actively visiting known locations of rare plants and finding more as mapping and vigor data is being taken. PEPP is focused on target species at Kapunakea, with the intent to collect seed for future propagation of rare plants. Accurate mapping and vigor of these populations is a byproduct of the PEPP work.

Maui field staff also routinely monitor various rare plants. This method has provided us with finding seed production for the preserve’s rarest plant, *Colubrina oppositifolia*. One senescent tree of this species was found in 1993 and another found at a separate location in 2007. This species is in serious decline due to the infestation of Black Twig Borer (*Xylosandrus compactus*). A seedling propagated in 2003 and outplanted at Kapunakea has been relocated to Maui Nui Botanical Gardens, where it is thriving and potential source for air layers, cuttings, or other forms of propagation. Seeds were also sent to Lyon arboretum for storage to use in tissue culture. When there is enough healthy stock to select from, plants may be relocated to Kapunakea in the future.

Activities

Years 1-6 (FY2010-15)

- Continue to support PEPP in search and assessment of rare species populations to determine protection needs and to reduce threats.
- Maintain current maps of rare species populations.

This program represents an estimated 1% of the overall effort and budget in this long range management plan.

Program 4: Community Outreach

Program Goal

To educate, empower, and engage the community in the preservation of their natural and cultural heritage from summit to sea.

Program Description

Sustaining biologically significant native ecosystems throughout the state requires an educated, empowered and mobilized public and private constituency. Our main goal is to increase conservation and advocacy for these areas through an understanding of the importance of, threats to, and protection efforts towards watersheds on Maui.

Currently, there is limited on-site public outreach at Kapunakea Preserve. TNC no longer provides scheduled monthly access to Kapunakea Preserve and other interpretive hikes. However, individuals may accompany staff and assist on field projects if they have experience in remote forestry work that requires camping. Also, the WMMWP provides the public information about forest protection efforts on West Maui and will provide the outreach infrastructure to safely lead selected groups into the preserve.

Activities

Years 1-6 (FY2010-15)

- Present slide shows and talks as requested by community and school groups.
- Lead special hikes for targeted community members.

This program represents an estimated 1% of the overall effort and budget in this long range management plan.

Program 5: Watershed Partnerships

Program Goal

Assist the long-term effective management of the native ecosystems of West Maui by the West Maui Mountains Watershed Partnership.

Program Description

The WMMWP provides protection for about 50,000 acres on West Maui administered by a coordinator and field crew (first hired in 2000). Activities include fencing, ungulate removal, and resource monitoring programs for all of West Maui's native forests. TNC's Maui Field Office has actively participated in partnership activities from the beginning in 1998. As a partner, we helped set management priorities, fundraise and administer projects. Initially, we supervised and trained WMMWP crews in ungulate and weed removal, monitoring techniques, fence building, and a wide array of safety procedures including rappelling, helicopter travel, and wilderness survival. The Maui Field Office will continue to provide the WMMWP with advice and training, and we will participate in management activities on partnership lands as needed. We will also continue to contract with the WMMWP for ungulate and weed removal and monitoring.

Activities

Years 1-6 (FY2010-15)

- Participate in partnership meetings to help set priorities for the WMMWP.
- Assist the WMMWP in accomplishing fundraising and management priorities.

This program represents an estimated 5% of the overall effort and budget in this long range management plan.

Program 6: Personnel, Equipment, and Facilities

Program Goal

Maintain staff and facilities required to implement the goals of The Nature Conservancy on Maui in a safe, productive environment.

Program Description

Under a sub-contract with WMMWP, we are able to deepen our effective removal of ungulates (our program's primary goal) through increased scouting and regular check and maintenance of fences and snares. WMMWP considers continuation of Kapunakea's management programs (particularly ungulate removal) key to the viability of the West Maui Mountains. As such, TNC seeks to continue to subcontract with WMMWP to remove pigs and monitor for their presence, conduct an annual aerial weed survey, maintain infrastructure, and provide occasional access to researchers.

We will operate equipment and facilities as necessary to conduct many of the activities described above. For example, staff and volunteers may maintain and develop management infrastructure such as foot trails, signage, small-scale shelters, and small storage facilities. Operation and landing of helicopters on designated landing zones (LZ's) will be a necessary component of control programs for non-native species, and for maintenance of safety and fire-suppression programs. New LZ's may be created as necessary. However, most of the few needed to date are already established. When a new LZ is established, we make a concerted effort to identify forest clearings that already exist (we also follow-up with routine inspections for invasive weeds).

Fire prevention and pre-suppression activities are necessary to prevent loss of native habitat from fires. For examples, fire breaks may be needed along the lower boundary to prevent fire spread from below. We will coordinate closely with the WMMWP and DOFAW for these activities and will support fire prevention and pre-suppression activities as needed. Although not listed as a separate management program, we may at any time divert resources to address urgent fire prevention and control needs. We will continue to support the WMMWP in developing a West Maui fire prevention plan.

TNC's Maui field office staff split time and effort between two preserves; approximately 10% is charged to Kapunakea and 90% to Waikamoi.¹ The Director of Maui Programs oversees all work and is responsible for planning, budgeting, and reporting activities. The Program Coordinator is responsible for tracking expenses, paying bills, reporting on the budget to the Director, and various administrative duties associated with running an office. The Maui Natural Resource Manager is responsible for the management of fieldwork in the preserve; in addition, some planning tasks are also a component to this position. The Field Representative is responsible for planning, reporting, and assists with outreach activities. The Invasive Plant Specialist is responsible for weed management, rare and endangered species monitoring, and coordinating scientific research in our preserves. The Field Coordinator is responsible for supervision of the Field Technicians and any other field staff or volunteers doing ungulate control work. Field Technicians are responsible for all threat control; these individuals also assist with research and outreach activities. It should be noted that TNC's negotiated fringe benefit rate with the United States Agency for International Development, our guiding federal agency, is currently 38.5%.

¹ Director of Maui Programs, Natural Resource Manager, Program Coordinator, Field Representative, Invasive Plant Specialist, Field Coordinator, and four Field Technicians.
Kapunakea Draft EA 2008

In terms of contractual and TNC time and effort, roughly 70% of personnel time budgeted for Kapunakea is spent on ungulate control; 15% is spent on weed control activities. The remainder of the time is divided among the following activities: monitoring (3%); rare species protection (1%); small mammal control (1%); community outreach (1%); watershed partnerships (5%), and planning and administration (5%).

The Nature Conservancy's Honolulu office provides administrative, technical and annual planning support. In particular, the Director of Conservation, the Science team, and other resource staff will help prepare annual plans and reports and develop and implement monitoring and research programs.

All full-time field staff are provided training in first aid, CPR, and fire suppression. Field staff participate in a variety of emergency and safety training programs offered by cooperating state and federal agencies (fire training, helicopter safety, hunter safety, rappelling, etc.). Other training needs, such as computer, communication, and other skill-building courses, are provided to staff on an individual, as needed basis.

Travel costs consist of airfare, ground transportation, board and lodging for TNCH staff traveling off-island, along with supervisory staff attending regular meetings at the Honolulu office. Because the NAP program requires an annual inspection, we have budgeted airfare for DOFAW staff to help cover expenses for this visit. Facilities costs include 10% of office and baseyard facilities incurred to support the Kapunakea Preserve program. Supplies include the cost of fuel, insurance, and maintenance for the vehicles, along with the cost of general supplies needed to perform overall management activities. Contractual fees consist of technical assistance provided by Hawai'i Biodiversity and Mapping Program (HBMP) and National Tropical Botanical Garden's botanists, ecologists, and science staff, who assist with resource monitoring and research, and data compilation.

This program represents an estimated 5% of the overall effort and budget in this long range management plan.

III. Summary of Major Impacts

Major Impacts – Positive

- Reduction of ungulate activity to a level that will promote and sustain measurable recovery of native vegetation in all management units. (The long-term goal is to eliminate all ungulate damage from Kapunakea)
- Reduction of the range of habitat-modifying weeds, and prevention of introduction of new problem weeds.
- Tracking biological resources in the preserve, and evaluation of changes in these resources over time to identify new threats.
- Logistical and financial support to approved research projects will improve management understanding and protection of the preserve's resources as well as other natural areas in the state.
- Prevention of the extinction of rare species in their preserve.

- Promotion of a more stable waters regime both in and below the project area by reducing the potential for rapid runoff from disturbed or degraded areas within Kapunakea through removal of feral animals and habitat-modifying weeds.
- Improved water quality (within and below the preserve) due to:
 - decreased erosion and its subsequent siltation of streams and nearshore waters, and
 - ungulate control, which lowers the potential for bacterial coliform and leptospirosis in the water.

Major Impacts – Negative

One potential impact is the accidental introduction or spread of new weed species by managers or visitors on equipment, supplies, or transport vehicles. Also, because herbicides are sometimes used to control habitat-modifying weeds (though we follow strict procedures in accordance with the Hawaii Dept. of Agriculture and official herbicide labels) in the preserve, there is a remote possibility of localized soil contamination. If we opt to use rodenticides, there will be a very small chance that non-target animals may be harmed. Occasionally there will be an increase in noise levels when helicopters are used to access remote areas. The “prop wash” of low-flying helicopters also might disturb animals such as tree snails and birds. However, with care, no major negative impacts are expected to result from the proposed activities.

IV. Alternatives Considered

Although the Nature Conservancy considered a variety of alternatives involving lower levels of management, we decided that the actions outlined in this assessment are all necessary to assure the continued protection of rare species and valuable habitat and watershed. These objectives represent the minimum level of action needed to sustain the current integrity of the preserve. Slowing the pace of management could jeopardize progress made in controlling feral pigs, weeds, and other serious threats. Similarly, a no-action alternative would promote the loss of rare Hawaiian ecosystems, plants, and animals. Furthermore, erosion of fragile forest top soils would continue at an accelerated rate, degrading one of the largest watershed areas in the state and nearshore reefs and fisheries.

V. Proposed Mitigation Measures

To prevent the accidental introduction or spread of weed or other pest species, anyone entering the preserve will be required to clean their clothing, boots, equipment, and camping gear of soil and plant material. Wherever possible, helicopter flights into the preserve will originate from invasive weed-free areas. All materials hauled in will be inspected and cleaned to remove soil, plant material, and insects. Helicopter landing sites and areas frequented by staff will be inspected for weeds each trip.

To prevent contamination of soil with herbicides, all field staff have been trained in the safe application of approved herbicides. Weed control staff are licensed by the state Department of Agriculture’s pesticide branch. Similarly, any diphacinone use at Kapunakea will be in accordance with the special local use registration, or with a state Department of Agriculture experimental use permit. One of the requirements of the special local use registration is to notify the Department of Agriculture before planned use of the pesticide. Staff supervising work conducted under an experimental use permit will have the required state Department of Agriculture Category 10 certification. We will utilize tamper-proof or tamper-resistant bait boxes designed to minimize the chances of non-target animal poisoning. The Nature Conservancy will

continue to work with the informal Toxicant Registration Working Group to employ the safest, most effective rodent control techniques.

Helicopter use is limited to essential conservation-related projects, and landings are restricted to very limited designated landing zones. To reduce noise and prop wash, we ask helicopter pilots to fly more than 1,000 feet above the forest canopy when traveling over the preserve.

VI. Determination

No significant negative impacts to the environment are expected to result from the implementation of the proposed activities. The anticipated determination for the Kapunakea Preserve Management Project and Long-range Management Plan is a Finding of No Significant Impact (FONSI).

VII. Findings and Reasons Supporting Determination

In summary, all activities are expected to be beneficial, or to have no long-term negative effect. The proposed activities are expected to benefit native species (including rare plants and animals), native natural communities, and important watershed, both in the project area and on adjacent lands. For example, ungulate control will protect rare plants and rare natural communities from browsing and other types of ungulate damage (including the spread of certain weeds). Active weed control in the project areas will also help protect rare plants and natural communities, and will indirectly help rare and other native animals. Active management of Kapunakea Preserve will also promote a more stable water regime both in and below the project area by reducing the potential for rapid runoff from disturbed or degraded areas.

This conclusion and determination was based on analysis of the following significance criteria regarding impact on the environment established in the EA preparation guidelines:

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The proposed activities are expected to benefit native species (including rare plants and animals), native natural communities, and important watershed, both in the project area and on adjacent lands. For example, ungulate control will protect rare plants and rare natural communities from browsing and other types of ungulate damage (including the spread of certain weeds). Active weed control in the project areas will also help protect rare plants and natural communities, and will indirectly help rare and other native animals. Active management of Kapunakea Preserve will also promote a more stable water regime both in and below the project area by reducing the potential for rapid runoff from disturbed or degraded areas.

Through a rigorous cleaning and monitoring program, the introduction or spread of new weed species by humans is expected to be minimal. Management-related impacts on historical resources in the area will be avoided. Furthermore, the risk of herbicide contamination is low because 1) only small volumes of approved herbicides are used, 2) staff are well-trained in herbicidal application, and 3) all chemical use is in compliance with the state Department of Agriculture's pesticide branch.

This project and proposed land use will not harm or impact cultural resources. This project in essence protects the native plants, animals and natural environment that are critical to Hawaiian culture. Given the sparse historical/traditional use of the lands comprising the Kapunakea Preserve, reflected by a lack of archeological sites, the key mitigation for cultural impacts lie in providing for protection of irreplaceable

native species and ecosystems forming the living foundation of Hawaiian culture, and ensuring appropriate and sustainable access to these resources for traditional use.

(2) Curtails the range of beneficial uses of the environment.

Our proposed natural resource management actions are compatible and appropriate for the remote, native forests of Kapunakea Preserve. Management actions aim to conserve and enhance overall current uses of the environment by protecting water resources, native habitats and species for education, culture, recreation, economic uses, climate change, soil and natural flooding mitigation. There will be no significant alterations to the existing terrain. All management activities are expected to enhance the physical condition of the surrounding area. Ungulate control activities are appropriate as this is not a designated hunting area. The few fences that are needed require a minimum of clearing and vegetation disturbance. Other activities like monitoring, education, and research only occur occasionally and do not involve any structures or visual impacts that would affect the surrounding area.

Maintaining the natural and physical, environmental aspects of the land through abatement of the key threats will help preserve the beauty and open space characteristic. Over time these aspects will improve by halting degradation caused by feral animals, the worst invasive weeds, and other threats. As there is a clear policy and established procedure for traditional Hawaiian access (TNCH 1996), this project helps to ensure cultural resources.

(3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions or executive orders.

The proposed actions are consistent with the environmental policies established in Chapter 344, Hawai'i Revised Statutes (HRS) and conserves threatened and endangered species, as covered by Chapter 195D, HRS. Management actions also support the purpose of the State land use designation of Conservation District under Chapter 13-5 by "conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare." The actions are consistent with goals and objectives of the West Maui Mountains Watershed Partnership and with the policies outlined in the Memorandum of Understanding of the Hawai'i Association of Watershed Partnerships. The actions are also consistent with various federal and state rare species recovery plans.

(4) Substantially affects the economic or social welfare of the community or state.

The affects on the economic and social welfare of the community and state are substantially positive. Ecosystem services provided by Hawai'i Watersheds are valued in the billions of dollars. The West Maui watershed provides similar value to the state and local economy. The projects provides great social welfare value by conserving the benefits of water, native habitats and species, culture, recreation, economic livelihoods, and education.

(5) Substantially affects public health.

This project will reduce public health risks by controlling non-native animal species. Pigs, goats, and axis deer are disease vectors and raise public health concerns. Pigs carry the human intestinal parasite which causes giardiasis, *Giardia lamblia*, which is very resistant to chlorination. *Leptospira* and other pathogens

are transmitted by the feces, urine, and carcasses of animals. *Cryptosporidium*, a disinfection-resistant protozoan, is transmitted by rodents, deer, goats, cattle, and cats. Programs already in place are aggressively addressing the problem of feral pigs and deer and in the future rats in the watershed. Should goats or cattle ever become a problem, they would be addressed as well. By continuing to provide high quality water and the climate and air filtering benefits of a healthy forest, public health will continue to benefit from Kapunakea Preserve management.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities.

There are no population changes or effects on public facilities anticipated. There are no full-time residents in the Kapunakea Preserve Management Area or existing extensive public facilities. The preserve is surrounded by private property and there is no public access. The few guided or limited hiking opportunities will not have an effect on public facilities.

(7) Involves a substantial degradation of environmental quality.

The goal of the management actions is to keep intact and enhance the existing watershed, its native habitats and species, and hydrological elements and features. Therefore, proposed actions will not substantially degrade environmental quality, but rather will conserve and enhance the existing high level of environmental quality found in the area for the long-term.

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.

Management actions have been described and identified in a comprehensive manner across natural resource management disciplines for the entire Kapunakea Preserve. These management actions also happen to reflect actions identified for the entire 50,000-acre West Maui Mountains Watershed Partnership Management Area. In addition, plans have been developed for neighboring Pu'u Kukui Preserve and the state West Maui NAR. As such, cumulative, and individual effects, have been considered throughout this environmental assessment. Since proposed management actions are to conserve and enhance existing conditions and prevent further degradation to the Kapunakea Preserve and the West Maui watershed, negative cumulative effects are not anticipated.

(9) Substantially affects a rare, threatened, or endangered species, or its habitat.

Proposed management actions will combat existing threats to rare, threatened, or endangered species and habitats. Fencing, animal removal, surveying and monitoring, and invasive weed and non-native animal management are aimed at protecting and enhancing these species and habitats. Several of the management actions also support existing plans (e.g. State Comprehensive Wildlife Conservation Strategy, U.S. Fish and Wildlife Service Recovery plans) that are geared for the protection and perpetuation of rare, threatened, or endangered species and their habitats. Therefore, anticipated effects are positive and no substantial negative effects are anticipated.

(10) Detrimentially affects air or water quality or ambient noise levels.

The protection of the native forest and watershed for their air and water quality services are one of the main goals of the proposed management actions. Healthy forests absorb carbon dioxide and provide oxygen as well as filter water and mitigate sedimentation in streams. Therefore, impacts to air and water quality will be positive, not detrimental. Temporary disturbance of ambient noise levels may occur during transportation of materials or staff via occasion helicopter, and access via vehicle. However, given that proposed areas for such activity are far from communities, actions will occur during daylight hours, actions are for short durations, and no residents live in these areas, impacts are not anticipated to be detrimental.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The purpose of several of the proposed management actions is to protect sensitive areas through fencing, invasive weed control, and recreation management as well as mitigate impacts posed by threats on fresh and coastal waters. As such, management actions are geared toward conserving such sensitive areas and actions are not anticipated to create any damaging affects to areas.

(12) Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.

Management actions are geared toward conserving the socio-economic value of Kapunakea Preserve by keeping intact scenic vistas and viewplanes. No buildings or large structures are being proposed. The upper most range of existing fencing height is less than 5 feet and its location in remote areas means residents should not be able to see it. If in the future, if Axis deer become a greater problem, the maximum fence height would be no higher than 8 feet.

(13) Requires substantial energy consumption.

Energy consumption of the management actions will be derived mainly from vehicle use for management and also the use of helicopters for transporting staff and materials and any hand power tools for fence construction and invasive weed management and other management activities. However, such energy consumption is linked with individual projects that are short-term or temporary in nature. No infrastructure or similar elements that require on-going energy consumption is being proposed. As such, management actions are not anticipated to require substantial energy consumption.

VIII. LIST OF PERMITS REQUIRED FOR PROJECT

All of the Kapunakea Preserve project area is zoned by the State as Conservation District. Therefore, a Conservation District Use Permit Application is being submitted concurrently with this EA. The project area is not in a Special Management Area; therefore county permits are not needed at this time. Specific work related to threatened and/or endangered species will require appropriate permits from the State and Federal agencies.

IX. EA Preparation Information

This document is an updated version of the Final Environmental Assessment for Kapunakea Preserve Natural Area Partnership, prepared in 1995 and then again 1997.

Presently, TNCH is seeking reauthorization of NAPP funding for the next 6-year period for the programs described within this *Kapunakea Preserve FY2010 – FY2015 Long-Range Management Plan*. This plan continues the programs implemented under the previous plans and environmental assessments. This plan was prepared in compliance with the NAPP agreement between the state, TNCH, and Hawai'i Administrative Rules Chapter 13-210. The primary EA preparer is:

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**APPENDIX 1
NATURAL COMMUNITIES OF KAPUNAKEA PRESERVE**

NATURAL COMMUNITY	HERITAGE RANK (a)
Lowland:	
Koa/‘Ōhi‘a (Acacia/Metrosideros) Lowland Mesic Forest ^{^†}	G3
Lama/‘Ōhi‘a (Diospyros/Metrosideros) Lowland Mesic Forest [^]	G3
Māmaki (Pipturus) Lowland Wet Shrubland	G3
‘Ōhi‘a (Metrosideros) Lowland Mesic Forest ^{^†}	G3
‘Ōhi‘a (Metrosideros) Lowland Mesic Shrubland	G3
‘Ōhi‘a/Uluhe (Metrosideros/Dicranopteris) Lowland Wet Forest [^]	G3
Uluhe (Dicranopteris) Lowland Wet Shrubland	G3
Montane:	
‘Ōhi‘a (Metrosideros) Mixed Montane Bog	G2
‘Ōhi‘a (Metrosideros)/Mixed Shrub Montane Wet Forest	G3
‘Ōhi‘a /‘Olapa (Metrosideros/Cheirodendron) Montane Wet Forest	G3
Aquatic Communities:	
Hawaiian Intermittent Stream	G4

(a) Heritage Rank:

- G2 = Imperiled globally (typically 6 to 20 current occurrences)
- G3 = Restricted range (typically 21 to 100 current occurrences)
- G4 = Apparently secure globally (>100 occurrences)

[^] = Not known from West Maui NAR

^{*} = Not known from Pu‘u Kukui WMA

**APPENDIX 2
RARE NATIVE PLANTS OF KAPUNAKEA PRESERVE**

SCIENTIFIC NAME	COMMON NAME	HERITAGE RANK (a)	FEDERAL STATUS (b)
<i>Acacia koaia</i> †	koai‘a, koai‘e, koa‘oha	G2	SC
<i>Alectryon macrococcus</i> var. <i>macrococcus</i> [^]	‘ala‘alahua, māhoe	G1T1	LE
<i>Alphitonia ponderosa</i> ²	kauila, kauwila, oa	G2	
<i>Argyroxiphium caliginis</i>	‘eke silversword	G1	
<i>Bobea sandwicensis</i> ^{^†}	‘ahakea	G1	
<i>Bonamia menziesii</i> ^{^†}	-	G1	LE
<i>Calamagrostis expansa</i>	-	G1	C
<i>Chamaesyce arnottiana</i> var. <i>integrifolia</i> ²		G1	
<i>Chamaesyce olowaluana</i> ²	‘akoko	G2	SC
<i>Clermontia oblongifolia</i> sbsp. <i>Mauiensis</i> ²	‘ōhā	G3T1	LE
<i>Colubrina oppositifolia</i> ^{^†}	kauila	G1	LE
<i>Ctenitis squamigera</i>	pauoa	G1	LE
<i>Cyanea glabra</i> ²		G1	LE
<i>Cyanea lobata</i> subsp. <i>lobata</i> ¹		G1	LE
<i>Cyrtandra filipes</i> ¹		G1	C
<i>Cyrtandra munroi</i> ¹		G1	LE
<i>Eurya sandwicensis</i>	ānini, wānini	G2	SC
<i>Exocarpos gaudichaudii</i> †	heau	G1	SC
<i>Geranium hillebrandii</i> (formerly <i>humile</i>)	nohoanu, hinahina	G1	C
<i>Hibiscus kokio</i> ssp. <i>kokio</i> †	koki‘o ‘ula‘ula	G2T1	SC
<i>Kadua</i> (formerly <i>Hedyotis</i>) <i>formosa</i> [^]	-	G1	SC
<i>Keysseria</i> (formerly <i>Lagenifera</i>) <i>maviensis</i>	hōwaiaulu	G2	
<i>Liparis hawaiiensis</i> ²	Jewel orchid	G3	
<i>Melicope orbicularis</i> *	alani	G3	
<i>Myrsine vaccinioides</i>	kolea	G1	C
<i>Neraudia melastomifolia</i> ^{^†}	ma‘aloha, ma‘aloha, ‘oloha	G2	SC
<i>Nothocestrum latifolium</i> ^{*^†}	‘aiea	G1	C
<i>Phyllostegia bracteata</i> *	-	G1	
<i>Phyllostegia stachyoides</i> *†	-	G1	C
<i>Platanthera holochila</i>	-	G1	LE
<i>Ranunculus mauiensis</i> ^{^†}	makou	G2	C
<i>Santalum freycinetianum</i> var. <i>freycinetianum</i>	‘iliahi, sandalwood	G3T3	

<i>Sicyos cucumerinus</i> [†]	‘anunu, kūpala	G1	SC
<i>Strongylodon ruber</i> ²		G2	

Number of rare plants in Kapunakea 34

¹ = Newly discovered since last Long-range management plan

² = Known from Kapunakea, recently given rare plant status

[^] = Not known from West Maui NAR 8

[†] = Not known from Pu‘u Kukui WMA 12

^{*} = Known from preserve historically (pre-1975) 3

(a) Heritage Rank:

G1 = Species critically imperiled globally (typically 1 - 5 current occurrences)

G2 = Species imperiled globally (typically 6 - 20 current occurrences)

G3 = Species has restricted range (typically 21 - 100 current occurrences)

GH = Species possibly extinct

Q = Questionable taxonomic assignment

T1 = Subspecies or variety critically imperiled globally

T2 = Subspecies or variety imperiled globally

TH = Subspecies or variety possibly extinct

(b) Federal Status:

LE = Listed as endangered

SOC = Special concern

C = Candidate

APPENDIX 3
RARE NATIVE LAND SNAILS OF KAPUNAKEA PRESERVE

SCIENTIFIC NAME	HERITAGE RANK (a)
<i>Partulina crocea</i> †	GNR
<i>Partulina perdix</i>	G1
<i>Partulina tappaniana</i>	G1
<i>Perdicella kuhnsi</i>	G1

† = Not known from Pu‘u Kukui WMA

(a) Heritage Rank:

G1 = Species critically imperiled globally (typically 1 to 5 current occurrences)

GNR = Insufficient data available to assign definite rank

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Appendix 5

Cultural Impact Assessment

for

KAPUNAKEA PRESERVE



Honokōwai Stream, Kapunakea Preserve, Lahaina District, West Maui

Cultural Impact Assessment

for

KAPUNAKEA PRESERVE

An Assessment of Impacts on Cultural Sites and Practices
at Kapunakea Preserve, Lahaina District, West Maui

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Prepared as a
supporting document for the
Environmental Assessment of the
Kapunakea Preserve
Long-Range Management Plan
Fiscal Years 2010–2015

AUGUST 2008

Executive Summary

A review of pertinent literature and records, interviews with regional cultural practitioners and elders, and coordinated surveys and investigations by the State Historic Preservation Division (SHPD) on sites, features and practices of cultural significance at Kapunakea Preserve, Lahaina District, Island of Maui, reveals that there are no archeological sites within the preserve, although adjacent lands makai (seaward) of the preserve and in adjacent Honokōwai gulch include significant sites. A field visit confirms that the closest sites lie hundreds of meters makai of the lower preserve boundary. This corroborates the described geography of historical activities in the region, concentrated in arable valley bottoms and lower elevations near the coast. The lands of the preserves bear significance as the wao nahele (forested zone) containing native plants and animals of great cultural value. The proposed conservation actions in the preserve, designed to protect the native forest and the native species that reside within it, will enhance the cultural value of the lands and will exercise care to retain traditional access, such as to gather native plant material for hula and other Hawaiian arts.

Cultural Impact Assessment

for
KAPUNAKEA PRESERVE

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Cultural Impact Assessment for **KAPUNAKEA PRESERVE**

An Assessment of Impacts on Cultural Sites and Practices at Kapunakea Preserve, Maui

Introduction

This report meets the requirements and standards of state environmental law, as delineated in Section 343-2 of the Hawai‘i Revised Statutes. This includes the Office of Environmental Quality Control’s (OEQC) requirement for environmental impact statements to consider effects on cultural resources or cultural practices. The Nature Conservancy of Hawai‘i is submitting this concise cultural impact assessment to identify and address the effects of its on-going land management actions on native Hawaiian cultural sites and practices at its Kapunakea Preserve. These management actions are detailed in the *Kapunakea Long-Range Management Plan Fiscal Years 2004 – 2009* (TNC 2003) and the current extension of the LRMP. All actions being proposed for reauthorization in the *Plan* are substantially similar to, and relevant to, the actions previously considered in the *Final Environmental Assessment for Kapunakea* for which the Conservancy received a "Finding of No Significant Impact" in 1995 and 1997 (TNC 1995 and 1997).

Methods:

Cultural Impact Assessments (CIA) are a recent additional requirement of the EA process, focusing on both documented and potential impacts of proposed actions on cultural sites and traditional practices exercised at a place by the communities associated with a place.

In ascertaining the potential impacts of its land management activities on cultural sites and practices, the Conservancy consults regularly with appropriate authorities, reviews published and unpublished literature, and takes advantage of its cultural expertise on staff, which in 2001 included Iokepa Naeole (a founding member of Na Kūkulu, Hawaiian cultural practitioners, and as of 2008 is no longer in the direct employ of The Nature Conservancy, but remains an important advisor) and Dr. Sam ‘Ohukani‘ōhi‘a Gon III (a cultural practitioner and researcher, now serving as Senior Scientist and Cultural Advisor of The Conservancy).

Extensive original background research for Kapunakea was conducted, including the entire period of human occupation in the area from traditional Hawaiian times to the early Twentieth Century. The major task of the background research was a literature review which included a review of Native Hawaiian historical accounts, legends, and traditions, Māhele documents, previous oral history projects, and previous archaeological studies. Research also included examination of the maps, historical photos, and other documents on file at the Hawai‘i State Archives, the Bernice P. Bishop Museum, the State Historic Preservation Division, the State Survey Office, and the Hamilton Graduate Library at the University of Hawai‘i at Mānoa.

Hawaiian language newspapers electronically rendered in the digital on-line resource Ulukau.org, were searched for relevant entries based on the place names associated with the Kapunakea Preserve:

Kapunakea, Hanaka‘ō‘ō, Honokōwai, Kapaloa, and spelling variants for these places (e.g., Hanakao-o), bearing in mind that newspapers of the time did not typically include diacritical marks. Only pertinent data describing the upland portions of these lands were considered in the impact assessment. It is noted later that the place name Kapunakea is associated with both a small coastal section north of Lahaina, and an small upland section relevant to the Kapunakea Preserve. Activities clearly referring to the coastal Kapunakea were not included in the assessment of history and impacts. Linked references to the two Kapunakea, however, were applicable and included.

As a partner in the West Maui Mountains Watershed Partnership (WMMWP), the Conservancy submitted in 2001, an Environmental Assessment (EA) for a Watershed Protection Project that encompasses the Kapunakea Preserve and an additional 50,000 acres in the West Maui Mountains (i.e. *Final Environmental Assessment for the West Maui Mountains Watershed Protection Project*, Feb. 2001). That EA received a "Finding of No Significant Impact" in 2001; and consequently, the project was officially allowed to proceed. Because the EA for the Watershed Protection Project covered an area that includes the Kapunakea Preserve, herein the cultural study of the EA is cited extensively as a significant source for identifying cultural sites and practices.

To assess the Watershed Protection Project’s potential effect on archaeological sites and cultural practices, the WMMWP conducted individual and group interviews with kūpuna on Maui (WMMWP 2001). Additional information was obtained from *Sites of Maui* (Sterling 1998). In preparing *Sites of Maui* the author, Elspeth P. Sterling, researched Hawaiian and English written records of Maui, talked with kūpuna, and traveled the island with anthropologists and local informants to rediscover the sites named in documents and in tradition. Essentially, *Sites of Maui* is a compendium of Maui ethnography, anthropology, and history that was scattered throughout Hawaiian-language newspapers, hard-to-find ethnographic classics such as Abraham Fornander's *Collection of Hawaiian Antiquities and Folklore*, and field notes, manuscripts, and oral recordings in the Bishop Museum Archives and other Hawaiian collections. Its value as a compendium of site-related information on cultural sites and practices is enormous. It represents oral history from kūpuna, many of which have now passed.

To further determine the effect of the Conservancy's land management activities at Kapunakea Preserve, three recognized cultural practitioners from the West Maui community were taken on site visits by Conservancy staff in fiscal year 2002. They were Hōkūlani Holt-Padilla from the Maui Arts and Cultural Center, Ke‘eaumoku Kapu of Kaua‘ula Valley, and Akoni Akana, Director of the Friends of Moku‘ula. Each was taken by helicopter to the intact bogs of Kapunakea where a traditional request for entry into the forest was performed before a short walk in the area. Later they were taken to the Conservancy's mid elevation camp at 3,200 feet. During these visits the cultural practitioners were able to meet Conservancy management crews, learn about the weed and animal control programs in place, and were introduced to a few of the plants and animals being protected in the Preserve.

A. Summary Description of the Affected Environment

Location

The 1,264-acre Kapunakea Preserve (Figure 1) encompasses portions of three traditional Hawaiian ahupua‘a (land divisions): Honokōwai, Hanaka‘ō‘ō, and Kapunakea (Donham 1994). The northern half of the Preserve, including Honokōwai Valley and Kapāloa Valley, is in the ahupua‘a of Honokōwai. The southern ridge area is within the ahupua‘a of Hanaka‘ō‘ō. And, a small portion at the southwestern edge of the Preserve is within the ahupua‘a of Kapunakea. It is important to note here, that there are two disjunct pieces of land that are named Kapunakea in the district of Lahaina. The upland piece is that which is partly included in the Kapunakea Preserve of its namesake. The other piece of land named Kapunakea is a small coastal piece further south, but north of Lahaina Harbor. In researching land use, it was important to ascertain if references to Kapunakea involved the upland piece, or the coastal piece. With one exception, references to Kapunakea in the State Archives referring to residence,

These ahupua‘a lie on the boundary of the moku (districts) of Kā‘anapali and Lahaina, with Honokōwai in the ancient northern moku of Kā‘anapali, and Hanaka‘ō‘ō and Kapunakea falling within the western moku of Lahaina. The furthest mauka (inland) extent of the Kapunakea Preserve lies at the juncture of the three ancient moku of the West Maui Mountains and overlooks the eastern moku of Wailuku. Various revisions in the districting boundaries (e.g., via the Mahele of 1848, Civil Code of 1859, Session Laws of 1909, and its 1932 revision) have brought all of the ahupua‘a of the Kapunakea Preserve into the modern district of Lahaina (see Sterling 1998).

Kapunakea Preserve lies wholly within and occupies a western portion of the area designated for the West Maui Mountains Watershed Protection Project (see below).

Hawaiian Cosmogonic background

The Hawaiian cosmogony views the islands of the archipelago as born of Papa and Wākea, primal ancestral parents. Wākea, sky-father inseminates Papa, earth-mother, and islands are born of the union. The island of Maui is among the first of the island-children born of Papa (Papa-hānau-moku, or Papa-birthing-islands). One traditional creation chant gives it thus:

‘O Wākea noho iā Papahānaumoku
Hānau ‘o Hawai‘i, he moku; Hānau ‘o Maui, he moku
Ho‘i hou o Wākea, noho iā Ho‘ohokukalani
Hānau ‘o Moloka‘i, he moku; Hānau ‘o Lāna‘i, ka ‘ula, he moku
Līlī‘ōpū punalua ‘o Papa iā Ho‘ohokukalani
Ho‘i hou o Papa, noho iā Wākea
Hānau ‘o O‘ahu he moku; Hanau ‘o Kaua‘i he moku
Hanau o Ni‘ihau, he moku; He ‘ula o Kaho‘olawe

Wākea lived with Papahānaumoku
Hawai‘i was born, an island; Maui was born, an island

Wakea returned, lived with Ho‘ohokukalani
Moloka‘i was born, an island; Lāna‘i was born, red, an island
Jealous of the second wife Ho‘ohokukalani was Papa
Papa returned, resided with Wākea
Born was O‘ahu an island; Born was Kaua‘i, an island
Born was Ni‘ihau, an island; An afterbirth is Kaho‘olawe

The cultural consequence of this tradition is that the island of Maui lies upon the genealogical line from the gods forward, tying all Hawaiians to the island. The general connection of kānaka (people) to the ‘āina (land) stems from this cosmogonic tradition.

Place Names

The cultural significance of places, whether they bear archeological sites or not, is often reflected in their names, which may reflect natural features, natural resources, historical events and figures, or other aspects of the history or cultural uses of an area. Although not exhaustive, the following place names are associated with Kapunakea Preserve, either within the preserve boundaries or lands immediately adjacent to the preserve. Sources such as Pukui et al (1974) and Sterling (1998) provide interpretation:

Hanaka‘ō‘ō – one of the ahupua‘a comprising Kapunakea, south of Honokōwai. Translated as "digging stick bay," possibly referring to cultivation recorded in the lowland portions.

Honokōwai – the large valley bearing a continuous perennial stream of the same name, extensively developed for lo‘i kalo on the flat bottomlands toward the estuary, extending for some distance inland. Translated as "bay drawing water."

Kā‘anapali – Translated as "cliff division," this place name honors a large stone that symbolizes pride in Maui, called, alternately Pōhaku-kā‘anapali (Kā‘anapali stone), Kā‘anapali-pōhaku, and Pōhaku-o-kā‘anapali. For the story of Pōhaku-kā‘anapali, see Sterling (1998), pp. 50-51.

Kapāloa – a stream that runs through the eastern portion of Kapunakea Preserve, emptying into the Honokōwai stream system. Translated as "the long fence/enclosure."

Kapunakea – a name for two separated land sections in Lāhainā district; one coastal and one upland. Only the upland section is part of Kapunakea Preserve. Both are among six land sections of Maui traditionally dedicated to the akua and the kahuna. Translated as "the pale spring."

Lāhainā – Moku (district) containing the majority of the ahupua‘a of Kapunakea Preserve. Only Honokōwai falls within the adjacent moku of Kā‘anapali. Translated as "cruel sun," referring to a protracted drought that caused everything to wither and dry. An alternate translation as "day of cruelty" is given in Andrews (1865).

Mauna Kahālāwai – Listed in Ashdown (1970) as the Hawaiian name for the West Maui Mountains. There is no detailed mo‘olelo explaining the origin of the name, and no old sources (e.g., Hawaiian language newspapers, traditional mo‘olelo, mele, oli) make mention of this name.

Pu‘u Kukui – Summit peak of the West Maui Mountains (see Mauna Kahālāwai) apex point for the ahupua‘a of Hanaka‘ō‘ō and Honokōwai. Translated as "candlenut hill"

Wahikuli – a stream that runs through the Kapunakea Preserve, but not bearing perennial flow continuously to the sea. Translated as "noisy place." No recorded tradition explaining the name.

Winds & rains

Part of the cultural significance of an area is captured in Hawaiian characterizations of its dynamic natural features, the most prominent of which are winds and rains. Hanakaulana (1871) provided some basic characterizations for Lāhainā winds, though there is no description of the extent of these winds into the upland sections that comprise the Kapunakea Preserve:

Hanakaulana, G.H. 1871. Features of Lahaina. *Ke Au Okoa*, Oct 26 1871. Translation in Hawaiian Ethnological Notes. 1:2810.

These are the customary winds, the Ma‘a‘a, Kaomi, Moa‘e, and Hau. The winds that blow occasionally are the Kaua‘ula, the Imihau, the Ho‘olua, and the Kona. If the wind blows recklessly, from directly in front of Lahaina, that is the Kona. If a gentle sea breeze, like the Ma‘a‘a blows at night, that wind is the Ululua. It is kapu to go on the sandy shores of Lahaina then, lest one encounters the procession of ghosts, the marchers of the night, according to the old folks.

Not all of these winds are applicable to Kapunakea Preserve lands. The Kaua‘ula wind, for example, is described as strong wind, named for the valley of its origin "though which it rushes at times from the wooded peaks down upon Lahainaluna and Lahaina." Thus, although a wind of the Lahaina district, the Kaua‘ula is a wind of the lands south of the Kapunakea Preserve, restricted according to its origins and pathway, out of Kaua‘ula valley and downward to the port town of Lahaina.

Names of rains are often shared with winds, especially if the two occur typically together. For example, the famous rain of Waimea, Hawai‘i, the Kīpu‘upu‘u, is a cold, hard-hitting, wind-driven rain that raises chicken-skin. The name refers to both wind and rain. Thus at least some of the wind names listed above may also refer to rains, such as the Kaua‘ula, a name that can be translated as "the red rain." One other famous rain of Lahaina, the Uapa‘ūpili, translates as "rain moistening pili grass." The many terms for rains of the uplands, typically cold and accompanied by wind and fog/mist, such as ki‘owao, ko‘iawe, ‘awa, kēhau, kilihune, lelehune, noekolo, and uakoko, apply certainly to the uplands of Kapunakea, but are also generally applied to montane wet areas throughout the islands.

B. Historical/Archaeological and Cultural Sites

No archeological sites reported

Information gathered from these sources suggested that few if any historical sites are known in the area of the Watershed Protection Project (WMMWP 2001). It is highly informative that there are no recorded sites associated with the lands of the Kapunakea Preserve, despite relatively intensive land use history and density of archeological sites at lower elevations in the same land sections, and in larger valleys adjacent to the Preserve. These are described in some detail below.

Consultations

Charles Keau, a cultural expert associated with the Maui Historical Society and the Bailey House Museum, and consulted in the 2001 EA process, was not aware of any archaeological sites in the high mountainous areas on West Maui. Hōkūlani Holt-Padilla, a respected cultural expert and kumu hula, also interviewed during the 2001 EA, was also not aware of archaeological sites mauka of the conservation district in the West Maui Mountains. She also informed the WMMWP that there are cultural sites in the West Maui Mountains, such as ‘Ele‘ele Spring above Waihe‘e, which may not contain physical archaeological remains, but are considered traditional cultural property because of their importance in story and song. These and other wahi pana [storied places] retain cultural significance despite lack of archeological findings.

SHPD investigation

To further ascertain the potential of encountering archaeological sites and traditional cultural property in the Watershed Protection Project area, the WMMWP initiated with the cooperation of the staff of the State Historical Preservation Division (SHPD), an ethno-historic investigation of the upper elevations of the West Maui Mountains. The WMMWP reviewed with SHPD the proposed fence sites to determine the necessity of site visits by a qualified archaeologist. All Watershed Protection Project fences have been placed to avoid known historic sites, as well as areas with higher probability for sites (WMMWP 2001).

Prior to joining the WMMWP, the Conservancy obtained information on the cultural value of its Kapunakea Preserve and surrounding environs from an assessment compiled by Theresa Donham, then staff archaeologist with the SHPD. According to SHPD, clear and extensive evidence of pre-contact and early historic period taro lo‘i have been documented for adjacent Honokōwai Valley, between 800 and 1,000 feet in elevation, below the lowest elevation boundaries of Kapunakea Preserve, and also in a portion of the ahupua‘a north of the preserve (Donham 1994). Four complexes, consisting of numerous adjoining agricultural terraces, water channels, diversion dams, and habitation features were recorded as part of an inventory survey for a waterline project (*Archaeological Surface Survey, Honokōwai Gulch, Kā‘anapali, Maui*, Davis 1977). Agricultural features were found on both sides of the stream and continued upstream beyond the limits of the area that was examined during Davis’ survey. Additional remnants of an irrigated lo‘i system have been identified further downstream in Honokōwai Valley, well outside of the Kapunakea Preserve (Donham 1994).

SHPD also identified an historic trail that follows along the south side of Honokōwai Gulch within the Kapunakea Preserve. It was constructed by Pioneer Mill in order to access the water resources of

Honokōwai Stream (Donham 1994). This trail, which dates to the early twentieth century, is an excellent example of a non-vehicular industrial transportation route. It presently does not contain any modern construction materials. Also constructed by Pioneer Mill is the Honokōwai Tunnel, which extended across portions of Kapunakea Preserve, between the Honokōwai Stream intake and the Horner Reservoir. The tax map key of the Kapunakea Preserve area (4-4-07) shows an historic trail extending down the slopes of Pu‘u Kukui and into Hanaka‘ō‘ō. The trail splits near the Hanaka‘ō‘ō/ Honokōwai boundary and takes two routes toward the ocean. The origin and purpose of this trail are presently unknown. There is no evidence of recent or current use of this trail, consistent with the information compiled during practitioner interviews.

2008 field visit

Despite the significant development of agriculture in Honokōwai valley, the ridgetop portion of Honokōwai ahupua‘a that lies within Kapunakea Preserve bears no known or suspected archeological sites. Following on reports from TNC staff of sites below the preserve, a brief reconnaissance survey of the lands below the Kapunakea Preserve was conducted in April of 2008 by Clark Hill & Sam Gon, confirming that there are terraces and walled structures in the portion below the lowest preserve boundary at ca 1400, but the closest of these nonetheless lies about a half mile below the preserve boundary (Hill & Gon, personal communication 2008).

C. Cultural and Traditional Practices

Little reference to traditional practices

Correlating with the dearth of archeological sites in the mauka lands of the ahupua'a comprising the Kapunakea Preserve, there is very little reference to traditional activities associated with these land sections. Of the few references, none relate to farming or other practices that would have caused significant displacement of native forest, and instead, with one exception, related to development of the irrigation tunnels, trails and other infrastructure related to Honokōwai by Pioneer Mill.

The one pertinent reference to lands of Kapunakea dedicated to the practice of the kahuna strongly suggests that the use of the land for any of the typical needs of the maka'āinana (common people) would be preempted by the needs of the kahuna and their gods. Pualewa (1863) noted specifically:

The kahuna said to him [Ka'ululā'au, high chief of Maui], "This is the thing you should do, separate the land for the kahuna and when the kahuna lives on it to take care of the god, allot the lands for the chiefs and commoners." It was agreeable to him and he gave land to the kahuna and the god. These were the lands for him to live on, the two Kapunakea, 'Alamihi, and the three Pu'unoa, all together there were six lands set apart for the god. From the time that Ka'ululā'au set apart the lands for the god down to the time of Kamehameha I, whose kahuna was Hewahewa, these lands were in their [the kahunas'] care.

The reference above to the "two Kapunakea" relates to an earlier note (see Location, above) that there are two disjunct pieces of land that are named Kapunakea in the district of Lahaina. The upland piece is that which is partly included in the Kapunakea Preserve of its namesake. The other piece of land named Kapunakea is a small coastal piece further south, but north of Lahaina Harbor. In researching land use, it was important to ascertain if references to Kapunakea involved the upland piece, or the coastal piece. With the exception of the kahuna lands above, references to Kapunakea in the State Archives referring to residence, farming or other land use referred to the makai (coastal) piece, and are not directly relevant to the upland piece, and not included in this assessment.

Agriculture concentrated in lowlands

Similarly, references to land uses in Hanaka'ō'ō directly refer to agriculture and residence of the coastal portion of Hanaka'ō'ō at Keka'a, north of Lahaina. Handy (1940) noted specifically:

Keka'a, north of Lahaina, was once an area of intensive cultivation. This implies continuous cultivation *of the coastal region* [emphasis mine] along the northwest coast. Keka'a was the capital of Maui were Kaka'alaneo was reigning over West Maui... Many houses were constructed and people cultivated a great deal of potatoes, bananas, sugar cane, and things of a like nature. I have been told that the country from Keka'a to Hāhākea and Wahikuli (ahupua'a south of Hanaka'ō'ō and Kapunakea Preserve) ... was all cultivated. This chief also planted breadfruit and kukui trees down at Lahaina.

Thus, as was typical in precontact, missionary, and monarchical times, agriculture was concentrated in the lowlands, in valley bottoms fed by continuous perennial streams (such as Honokōwai) and springs, and in areas of mesic (even dry) lowlands near the coast but above the influence of salt spray. This is consistent with a lack of significant archeological sites in the Kapunakea Preserve, and a pattern of crown ownership of the uplands.

Cultural practices mentioned in interviews

According to the cultural experts interviewed by WMMWP (2001), the lower reaches of the WMMWP are visited occasionally by hula practitioners for gathering of adornment, e.g., palapalai (*Microlepia strigosa*), liko (leaf buds of ‘ōhi‘a, *Metrosideros polymorpha*), and maile (*Alyxia oliviformis*). No problems have ever been reported regarding access from the landowners for traditional gathering practices. Because feral animals were not known in the West Maui Mountains until the later half of the 20th century (see West Maui Mountains Watershed Management Plan, 1997), the Kapunakea Preserve has not seen a long history of customary use as a hunting area.

Admission of visitors to the West Maui watershed has been controlled by the individual landowners (e.g. TNC, Amfac JMB, Maui Land & Pineapple) and is not within the purview of the Watershed Protection Project to grant such access, as liability and insurance concerns remain the responsibilities of the landowners. Every landowner within the WMMWP, however, has indicated that they honor native Hawaiian gathering rights.

D. Cultural impacts and benefits of the proposed actions

Alien species control benefits archeological sites

Under the direction of the WMMWP, the Watershed Protection Project represents a first step in the protection of any archaeological sites in the high elevations of the West Maui Mountains (WMMWP 2001). Ungulates, particularly feral pigs, cattle and goats, are known to disturb archaeological sites because they knock over stone walls, turn over soil, spread noxious weeds, and initiate accelerated erosion and landslides. Strawberry guava (*Psidium cattleianum*) is a weedy tree spreading rapidly in the West Maui Mountains, in part, because of the foraging of feral pigs. Strawberry guava forms impenetrable thickets and develops strong root systems that can destroy the integrity of an archaeological site. One of the long-term goals of the WMMWP is to stop the spread of invasive weeds such as strawberry guava and restore native forest cover.

Fencing

The Watershed Protection Project is focused on protecting native forest cover by constructing strategic fences and removing non-native animals and weeds. Neither of these activities impedes human access or cultural practices. Project fences across traditional trails or more modern routes used by hikers will have climb-over bars installed to make for easier crossings if necessary (WMMWP 2001).

During the aforementioned interviews with cultural experts, no specific objections were raised regarding the potential curtailment of cultural practices as a result of project activities (WMMWP 2001). The general consensus was that current gathering for cultural practices does not occur in the high elevations where the project fences are proposed. It was surmised during one of the interviews that some hikers might be offended upon encountering a fence in a wilderness setting. It was suggested that further outreach to inform the community about the purpose of the fences will help alleviate negative perceptions. In this vein, the WMMWP has expanded its outreach activities to local communities around the mountain highlighting the need for watershed protection.

Hawaiian gathering rights

Admission of visitors to the watershed is controlled by the individual landowners (e.g. TNC, Amfac JMB, Maui Land & Pineapple) and is not within the purview of the Watershed Protection Project to grant such access, as liability and insurance concerns remain the responsibilities of the landowners. Every landowner within the WMMWP, however, has indicated that they honor native Hawaiian gathering rights. The Nature Conservancy of Hawai'i has maintained a specific policy to honor traditional access rights since 1983, which was further elaborated in 1996 to include intellectual property rights (TNCH 1996). These practices apply to Kapunakea Preserve.

According to the cultural experts interviewed by WMMWP (2001), the lower reaches of the project site are visited occasionally by hula practitioners for gathering of adornment, e.g., palapalai (*Microlepia strigosa*), liko (leaf buds of 'ōhi'a, *Metrosideros polymorpha*), and maile (*Alyxia oliviformis*). No problems have ever been reported regarding access from the landowners for traditional gathering practices.

The watershed protection efforts occurring in West Maui will help protect and maintain populations of native and Polynesian introduced plants important to native Hawaiian cultural practices (WMMWP 2001). Examples of Polynesian plant introductions that occur in the Watershed Protection Project area include: ki (*Cordyline terminalis*) with a multitude of uses, including food preparation and hula costuming; kukui (*Aleurites moluccana*) used for its oil and as a food product; and ‘awapuhi kuahiwi (*Zingiber zerumbet*) used medicinally and for scenting kapa. The project area also represents refugia for endemic plants that historically had great cultural or economic significance to native people. Examples include: kauila (*Alphitonia ponderosa*) used for spear making; olonā (*Touchardia latifolia*) used for cordage for fishnets, a base for feather capes, and strong rope; and pāpala kēpau (*Pisonia sandwicensis*) the sticky fruits of which were used to catch forest birds used in feather work. By protecting ethnobotanical plants, the project is enhancing the renaissance of Hawaiian culture, and ensuring continual practice into the future.

The Watershed Protection Project is also benefiting traditional native Hawaiian gathering of freshwater animals including mountain ‘ōpae (*Atyoida bisulcata*), ‘o‘opu (various species of gobiid fish), and hīhīwai (*Neritina granosa*) (WMMWP 2001). These aquatic organisms thrive with abundant clean, cool stream flow and are dependent on healthy watersheds for their survival.

Within the Watershed Protection Project area, access to Kapunakea Preserve proper is by permit only and will only be approved for legitimate scientific or cultural activities that do not significantly impose negatively impacts on the living native resources of the preserve. The main interpretive trail in Kapunakea has been closed due to dangerous conditions (e.g. rock falls) so guided hikes on this trail have been indefinitely suspended. This closure does not curtail legitimate Hawaiian cultural access.

E. Summary Description of the Action's Effect on Cultural Sites and Practices

The WMMWP, of which the Conservancy is a part, is committed to reversing the current degradation of the natural resources of the West Maui Mountains caused by the damaging effects of non-native plants and animals. Reduced populations of ungulates and aggressive weeds will also help to protect the integrity of the cultural sites. Without exception these cultural practitioners concurred that the actions of the Conservancy were essential to the protection of Kapunakea's native plant, animal, and historical/cultural assets. None of the fences proposed for the Watershed Protection Project will impede legitimate public access on established trails, nor is it anticipated that the WMMWP management activities will curtail any existing, legal public use of the watershed. Any person who is in good enough physical condition to hike to a strategic fence will have no problem crossing over the fence. Field workers will be instructed to halt fence work and report to proper authorities should they encounter any evidence of a suspected archaeological site.

With regard to Kapunakea Preserve proper, the State Historic Preservation Division (SHPD) has determined that, in general, the proposed activities will have no effect on significant historic sites. If future uses of the Preserve require alteration or improvement of the Honokōwai Trail, Pu'u Kukui Trail, or areas in the Honokōwai Stream bottom involving known or suspected taro lo'i, SHPD recommends that background research and field survey be completed for these areas. However, no such actions were proposed in those areas in the previous plan (*Kapunakea Long-Range Management Plan Fiscal Years 2004 – 2009*), nor in this current plan extension.

F. Mitigation of cultural impacts

Given the sparse historical/traditional use of the lands comprising the Kapunakea Preserve, reflected by a lack of archeological sites, the key mitigation for cultural impacts lie in providing for protection of irreplaceable native species and ecosystems forming the living foundation of Hawaiian culture, and ensuring appropriate and sustainable access to these resource for traditional use. As there is a clear policy and established procedure for traditional Hawaiian access (TNCH 1996), there is no current need for mitigation, aside from maintaining and practicing in accordance with policy.

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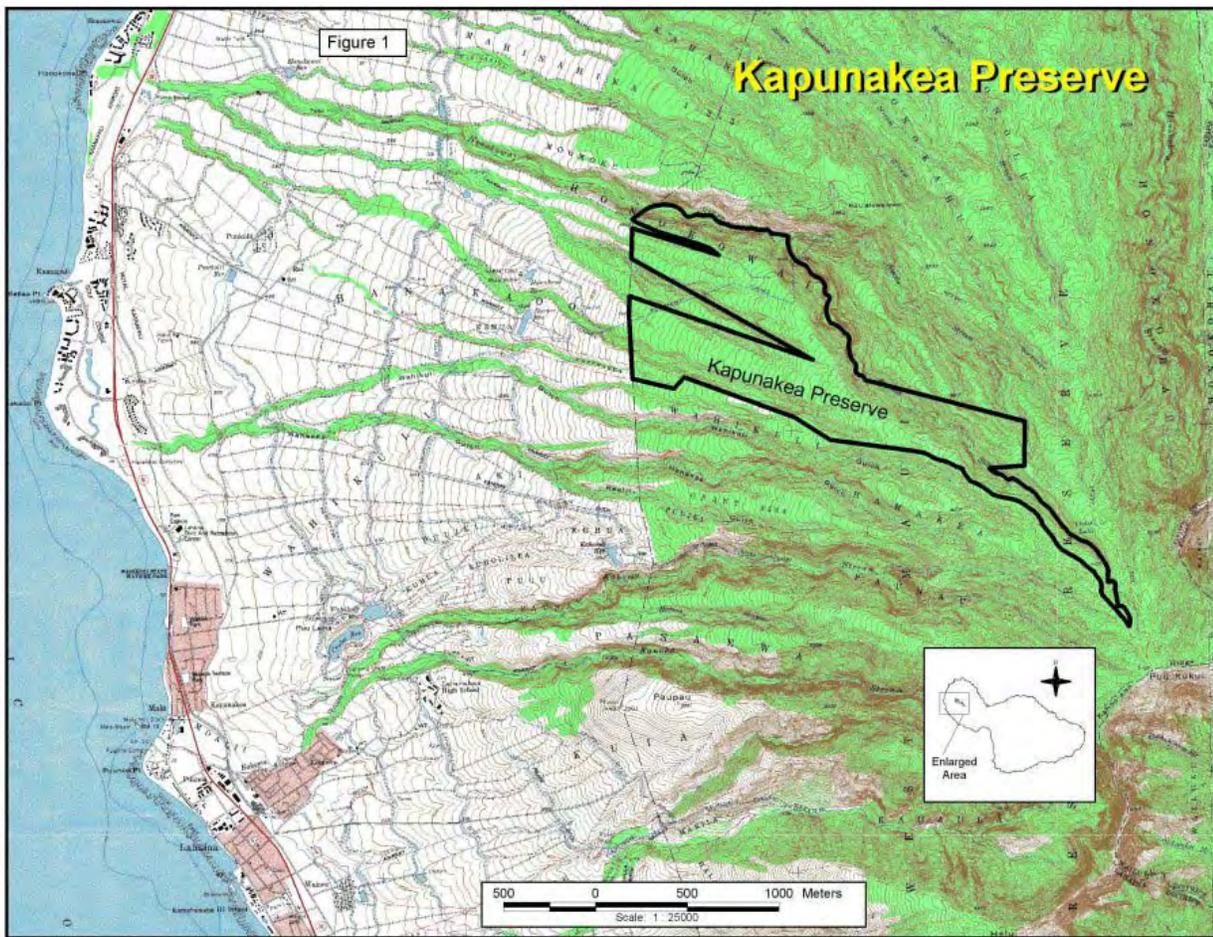


Figure 1. Kapunakea Preserve lies in the northwestern quadrant of West Maui (see island inset), in the district of Lahaina. From north to south, Honokōwai, Hanakaʻōʻō, and Kapunakea are the three ahupuaʻa whose portions are to be found within the preserve boundaries.