7.6. POHAKULOA TRAINING AREA (PTA)

7.6.1. General Description.

a. Location and Size. PTA is located on the Big Island of Hawaii in the saddle in between three volcanoes: Mauna Loa, Mauna Kea, and Hualalai Mountain. The area consists of 44,027 hectares (108,792 acres) of which 34,323 (84,815 acres) are ceded; 9,694 (23,954 acres) are leased (9,296 from the State, 2 from the Mauna Kea Property and 397 from the Smart Trust); 9 hectares (23 acres) are Easement /License/Permit. There are 232 hectares (574 acres) in the cantonment area. The Keamuku parcel is located just to the northwest of PTA proper and covers roughly 9,308 hectares (23,000 acres). This property may be purchased by the Army in the near future to facilitate SBCT training.

b. Military Land Use. The types of land uses at PTA include cantonment, airfield, maneuver training areas, live-fire ranges, and training areas unsuitable for maneuver. The 22 live-fire training ranges are located in the northern and eastern portions of the reservation. There are 144 hectares (357 acres) for range use, 7,749 hectares (19,148 acres) suitable for maneuver training, and the PTA cantonment area encompasses an additional 232 hectares (574 acres). This leaves 15,185 hectares (37,523 acres) considered as unusable acreage for maneuver training and range use within the installation boundary. An additional 23,367 hectares (57,740 acres) of leased properties are available as occasional use land. However, these occasional use areas carry many restrictions with them. These restrictions range from considerations of calving seasons to maneuver restrictions. The ranges and artillery firing points located in surrounding maneuver areas are oriented so munitions are fired toward the impact area of approximately 20,639 hectares (51,000 acres) within the central portion of PTA. There are two exceptions to this: Two M16 ranges are currently oriented to the east. These ranges are scheduled to be closed. Keamuku, should it be purchased, will be used for maneuver training.

c. Training Capabilities. PTA is the largest contiguous training area in Hawaii. The impact area supports all weapons assigned to the 25th ID(L) and USARHAW. The large areas around the impact area support maneuver training. All conventional weapons and munitions can be used in the ceded land portion at PTA. PTA also supports Infantry Brigade Task Force Deployments, Artillery Live-Fire, Attack Helicopter Gunnery, Air Defense System Live-Fire, Air/Ground Operations, Combined Arms Live-Fire, and Parachute Drops.

d. Climate. Temperatures are mild with cool nights due to the high elevations. The annual mean temperature in the lower elevations at PTA is about 15.6 and 10° C (60° F and 50° F) at higher elevations. The area is subject to occasional fog and frost, with frequent light rains in the winter months. The area is also subject to “vog”, a term used by local people to describe foggy conditions due primarily to emissions of volcanic dust and ash. Winds tend to be gustier during the winter, while light winds continue in the dry summer months.

(1) Rainfall. Average annual rainfall is 38cm (15 inches). Annual rainfall is variable because PTA is in the middle of a trade wind inversion zone between 2,023 to 2,823 (5,000 to 7000 ft) in elevation. Even a 100-meter change in elevation or in location can make a noticeable difference in atmospheric conditions.

(2) Temperature. Temperatures at PTA show very little variation throughout the year, though reports of frost or snow at higher elevations occur periodically. The average annual temperature from 1996 to 1998 was 17.7° C (63.8° F) (average monthly max=19.6° C (67.2° F)

in July and average monthly min=15.3° C (59.6° F) in February (Fujioka and Haught, unpublished data)).

(3) Relative Humidity. Average relative humidity is about 70 to 80 percent in windward areas below the inversion level and less than 40 percent above.

(4) Wind. Prevailing winds over the island are generally from the northeast, but other winds, especially from the south through the west, are not uncommon. Localized patterns are quite variable, as influenced by Mauna Kea's mass and numerous prominent terrain features. The effect of topography can vary appreciably even with moderate deviation in wind velocity and direction, causing inconsistent wind behavior that is not readily predictable. Winds are generally out of the east in the mornings until orographic winds from the west overpower the trades in the early afternoon. This wind shift from easterly to westerly winds depends largely on the strength of the trades and the amount of cloud cover blocking radiative heating of the ground. During the transition period, winds are highly unpredictable in strength and direction. It is not uncommon for winds to shift 180 degrees over very short periods of time or distance. Average annual 20-ft wind speeds at Bradshaw Army Airfield from 1996 to 1998 were 10.7 mph (Fujioka and Haught, unpublished data) with very little variation from month to month (average monthly max=11.85 mph in December, average monthly min=9.72 mph in June). Constant vigilance to wind conditions is critical during fire protection.

e. Topography. PTA is in a "dry tropical upland (tropical sub-alpine dry land) biome unique to the Hawaiian Islands. The area is volcanic lava plateau, or plain, dotted with "puu" (cinder cones), and underlain by igneous beds. Slopes rise from the lava plateau between Mauna Kea to the north and Mauna Loa to the south of PTA. This plateau is referred to as the "saddle" area of the island. The elevation differences within PTA between lowest area of the plateau and the Mauna Kea slope range from 1,631m to 3,501m (4,030 to 8,650 ft).

7.6.2. Vegetation Fuels Classification.

The wildland fire fuel types found at PTA on the island of Hawaii are very different from those on Oahu. Plant Communities were mapped by Castillo *et. al.* (1997). These were grouped into six (6) classes to aid in mapping (Figure 12). These classes were derived from a set of fuel models described by Anderson (1982) representing fire behavior fuel models. Corresponding PTA Plant Community Types [PCT], per Castillo *et. al.* are shown in brackets.

a. Barren and Sparsely Vegetated Lands. [PCT 1, 2, 9, and 24].

(1) Lands dominated by barren lava or lava possessing a discontinuous and open vegetation structure. These lands comprise the majority of PTA. They do not have fuel loads sufficient to carry fire and are suitable to use as natural firebreaks.

(2) Fuel Model Correlate: None

b. Perennial Grassland. [PCT 22 and 23]

(1) Land dominated by perennial alien (*Pennisetum setaceum*) and native (predominately *Eragrostis atropioides*) grasses averaging about 1 meter in height. Found primarily on older substrates having relatively developed soils (~10,000 years old), however, some *P. setaceum* dominated lands are found on younger lava. These grasslands extend down slope from PTA on

the leeward side of Hawaii in the North Kona and South Kohala districts below 1900 m (6232 ft MSL). Fine fuel loads are usually continuous and 0" to 3" deep. Grass litter accumulation is usually high.

(2) Fuel Model Correlate: 1

c. Lowland Montane Shrubland. [PCT 6, 11, and 21]

(1) Land dominated by low-structure shrubs or a mixture of low-structure shrubs and annual and perennial grasses. Includes *Dodonaea* shrubland, *Myoporum* shrubland and *Chenopodium* shrubland. Found primarily on Mauna Kea substrate with relatively developed soils. Grass and shrub litter accumulates to form continuous fine fuel loads, which carry flame lengths of 2-3 m on the average (observation). These shrublands occupy portions of the Pohakuloa plain along Saddle Road (2,428m or 6,000 ft) and parts of the Kipuka Kalawamauna down slope into the lowland regions of Puu Anahulu and Puu Nohonaohae (1,009m or 2,493 ft). These shrublands burn frequently (every 1-4 years).

(2) Fuel Model Correlate: 2

d. Tall Montane Shrubland and Scrub. [PCT 7, 8, 10, 13, 14 and 20]

(1) Land possessing vegetation that is dominated by a mixture of taller (>2 m) woody plant species in a relatively dense structure. A continuum of fine fuels in the understory creates an environment where fire is easily carried. This fuel type includes dense mixtures of woody and herbaceous plants in the Kipuka Alala and other relatively old Mauna Loa kipukas, and the Dodonaea mixed shrubland and Chamaesyce treeland of Kipuka Kalawamauna. These types occur below 2,428m (6,000 ft). Observed flame lengths in this type average 3-4 meters.

(2) Fuel Model Correlate: 3

e. Subalpine Open Treelands and Low Shrub. [PCT 3 and 4]

(1) These plant communities exist on Mauna Loa lava where soil development is minimal. The overstory is sometimes scattered with Ohia (*Metrosideros polymorpha*) trees and the understory is made up of a mixture of Alii (*Dodonaea viscosa*), Pukiawe (*Styphelia tameiameia*), and Ulei (Osteomeles anthylidifolia). Herbaceous fuel loads are low, however, in many of these areas the shrub layer is dense enough to carry a fire. These types occur in the southwestern and southeastern portions of PTA up to 2,655 (6,560 ft).

(2) Fuel Model Correlate: 4

f. High-stature Upland Shrub. [PCT 12, 15, 16, 17, 18 and 19]

(1) Land dominated by some form on the Naio (*Myoporum sandwicensis*) and Mamane (*Sophora chrysophyla*) tall shrub formation. These vegetational associations vary in quantity of fine fuels in the understory and density of the shrub overstory. On younger lava, this type can possess an open or closed stand structure and has little herbaceous material in the understory. On older sites, like those on the slope of Mauna Kea, and in older kipukas of Mauna Loa, native and alien grasses create a continuous fine fuel bed in the understory. At PTA these types occur below 3,035m (7,500 ft).

(2) Fuel Model Correlate: 5

g. Ohia Mixed Treeland. [PCT 5]

(1) This fuel type is restricted to middle-aged Mauna Loa lava between below 2,124m (5,248 ft). The overstory is dominated by Ohia and other native tree species (*Myrsine lanaiensis, Myoporum sandwicensis,* and *Santalum paniculatum*), while the understory is a continuous fuel bed of shrub grasses and forbs.

(2) Fuel Model Correlate: 6

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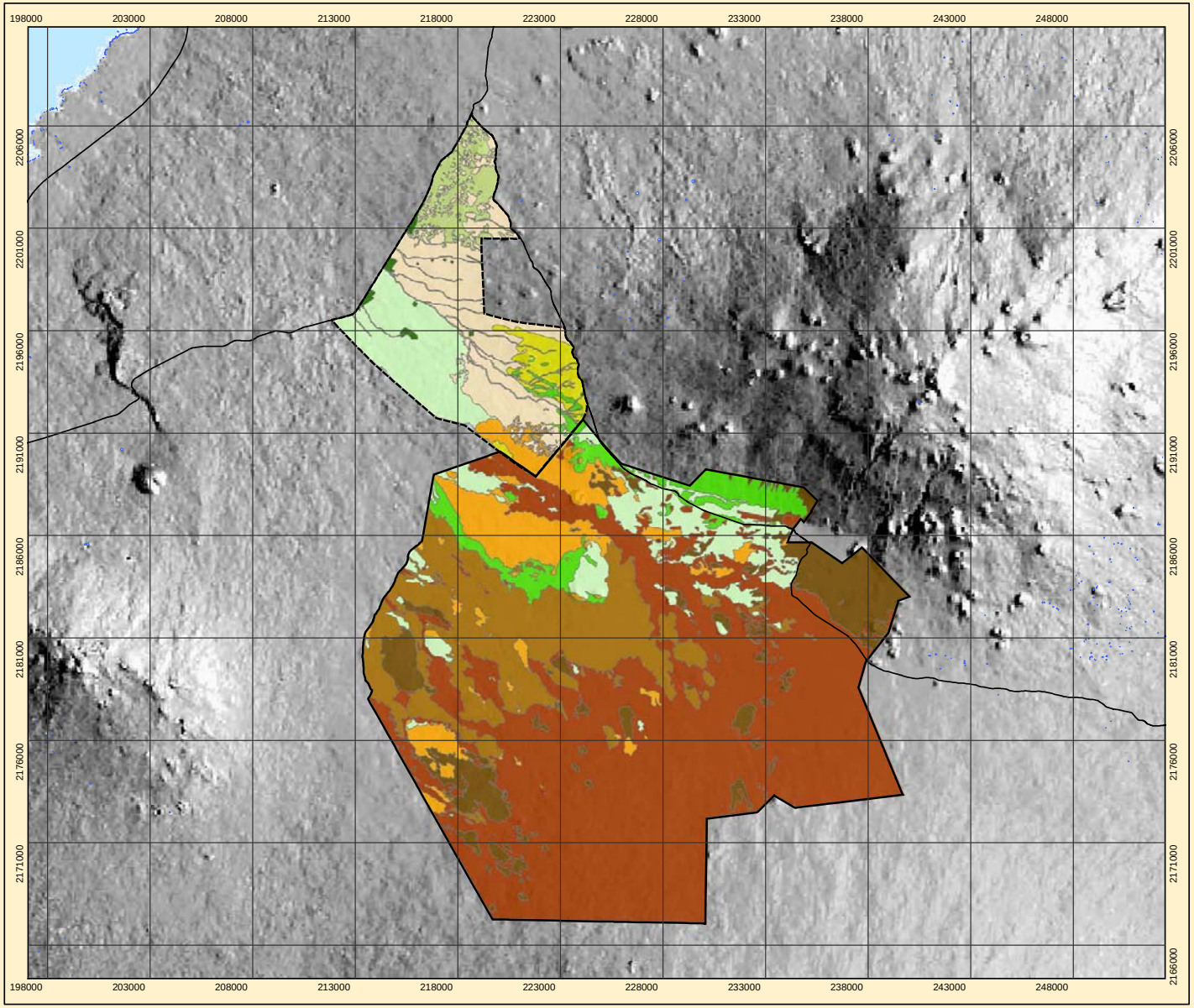

Pohakuloa Training Area
Fuels

Figure 12

Legend

Fuels

- Dense Shrub
- Eucalyptus
- Grass/Shrub Mix
- Intermediate Shrub
- Grass
- Lava
- Mature Shrub
- Open Treeland
- Shrub w/ Grass Understory
- Rangeland
- Sparse Shrub

- Installation Boundary
- Keamuku Parcel
- Surface Water Body
- Primary Roads

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Shaw & Castillo 1997
Arnett 2002

7.6.3. Fire History for PTA.

a. Historically, fire in the area of PTA was most likely rare and of little significance, limited to volcanically started fires and occasional lightning ignitions. Military use for live-fire exercises and target practice has increased ignition frequency dramatically and resulted in numerous small fires, though it appears that much of the threat to endangered species populations is a result of off post ignitions.

b. Fire history at PTA was inferred as best as possible from existing fire records and documentation provided by various agency sources. Fire records were numerous for PTA but most were incomplete. Many records included a date, time, and location for each fire but very little information was available about the size of fires or the weather conditions during the fires. (See Analysis of Fire Management Concerns at PTA, Beavers and Burgan2000).

c. Fires caused by tracer ammunition is by far the largest cause of fires at PTA. This comes as no surprise since tracers easily start fires and are one of the most commonly used munitions. It is important to note that fires originating from non-military sources have caused the overwhelming majority of the acres burned at PTA. Since July 1990, over 3,237 hectares (8,000 acres) have been recorded as burned. Of these, over 3,116 hectares (7,700 acres) or 91% of all acres burned, were burned by fires caused by lightning, arson, or carelessly discarded cigarettes, and the largest of these started off of Army lands and later burned into PTA (Refer to Reference 7.6.1).

d. Based on fire history for PTA, the data show that the western and the northern sections of PTA potentially face the greatest threat of wildfire. Military training activities have been the leading cause of past fires. The high risks inherent in military training activities, the existence of heavy loads of readily ignitable fuel, and the prevalent dry conditions of the area present significant fire management problems for the training area and adjoining lands.

Reference 7.6.1
PTA Fire History

Figure 1
Number of Fires per Year at PTA
1987-1999

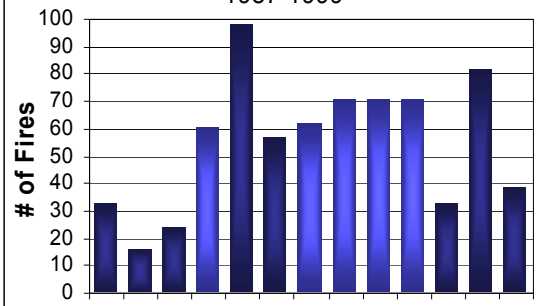

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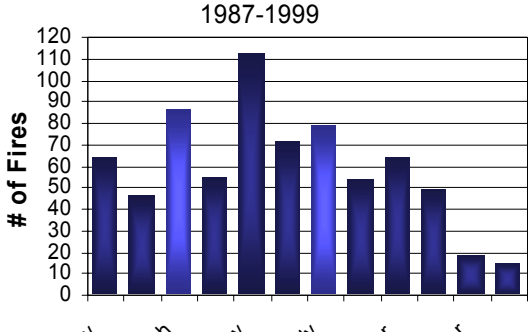
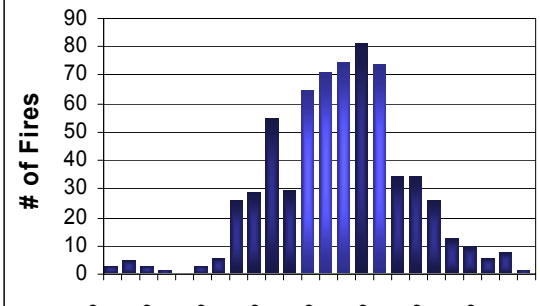
Figure 2
Number of Fires per Month at PTA
1987-1999



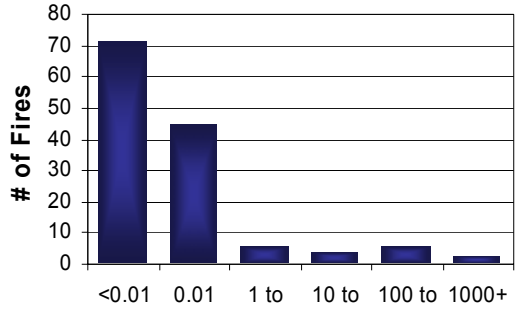
n=706

Figure 3
Number of Fires by Time of Ignition
at PTA 1987-1999



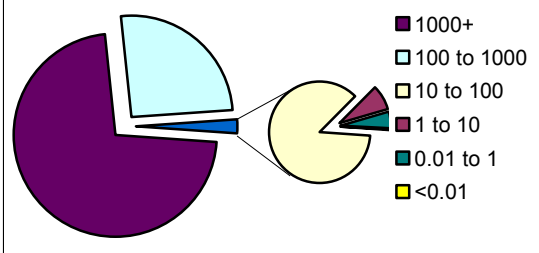
n=641

Figure 4
Number of Fires by Acreage Class at PTA
1987-1999



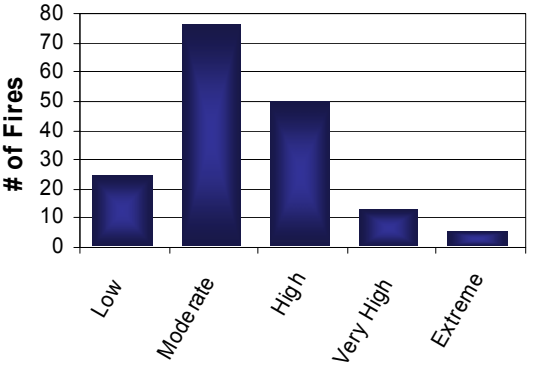
n=130

Figure 5
Percent of Recorded Area Burned
1987-1999 by Fire Size Class at
PTA



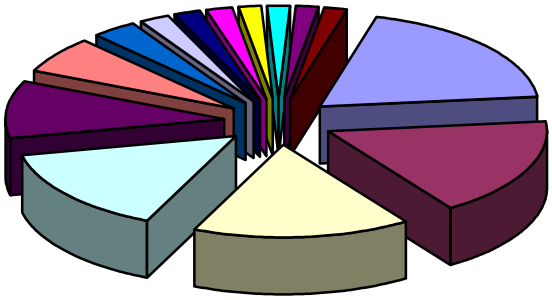
n=130

Figure 6
Number of Fires Occuring in Each Fire
Weather Rating at PTA 1987-1999



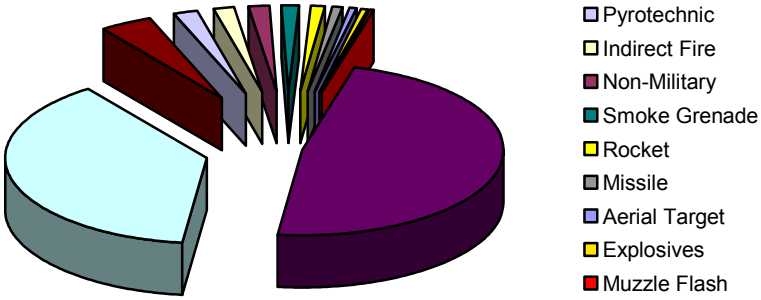
n=166

Figure 7
Percent of All Fires by Location at PTA
1987-1999*



n=704
*Areas with fewer than 10 recorded fires are included in the "other" category.

Figure 8
Percent of All Fires by Ignition Source at PTA
1994-1999



n=361

7.6.4 Resource Protection.

a. Biological Sensitive Areas (BSA).

(1) Relative to many other areas in the state, PTA contains an abundance of biological resources (Figure PTA-2). The majority of the training area is vegetated with native Hawaiian plants. In addition, rare terrestrial and subterranean community types are becoming better known. The training area is also home to the endangered Hawaiian Hoary Bat and rare endemic land snails. The HINHP guidelines are followed throughout all training sites.

(2) PTA has eight BSA-1 sites. Seven of these, including the three largest regions, are in the north and west quadrants of the training area. The majority of these sites are located west of the impact area.

(3) There are numerous BSA-2 sites at PTA. Much of the Palila Critical Habitat Area is designated a BSA-2 site, as is most of Kipuka Kalawamauna outside the Endangered Plant Habitat Area. Other BSA-2 sites include mamane/naio forest and shrub land patches in the impact area and the Mauna Kea slope area.

(4) Other sensitive areas at PTA include archaeological management areas, places where significant archaeological sites and/or structures (cultural resources) are known and require resource protection, and SEAs, areas designated for resource protection and subject to the training guidelines contained in the Ecosystem Management Plan Report for Pohakuloa Training Area. SEAs combine protection of both natural and cultural resources (i.e., they contain BSA-1s, BSA-2s and archaeological management areas).

b. Protected Species.

(1) PTA has approximately 5,466 hectares (13,507 acres) of endangered species habitat in the range and training areas on the installation, which are indicated on the 1994 Training Area Map prepared by the 29th Engineer Battalion at Schofield (Sheet: PTA, Series: W731S, Edition: 6-29). Designation as a federal endangered species requires the most protective resource management activities.

(2) Critical habitat for the endangered Palila has been designated on the installation. The Palila is found only in the mamane/naio dry forest, high on the slopes of Mauna Kea between 2,428m and 3,642m (6,000 and 9,000 ft) on the island of Hawaii. It feeds almost exclusively on the immature seeds of the mamane tree. The critical habitat area for the Palila covers all of TAs 2 and 10, and portions of TAs 1, 3, 4, and 11.

(3) Eleven plants identified on the installation are designated as endangered and one as threatened. Seven other species are considered as species at risk and are being monitored (Table 7.6.3).

c. Cultural Resources.

(1) Over 250 sites have been located and recorded at PTA with present total of approximately 14,973 hectares (37,000 acres) or approximately 60 percent of non-impact area surveyed. The DPW Environmental Division, Conservation & Restoration Branch carries out all Federal and State compliance requirements for both natural and cultural resources at PTA.

Two full-time staff at PTA carry out a Scope of Work (SOW) developed by the US Army Garrison-Hawaii Cultural Resources Manager. This SOW includes pedestrian survey and active monitoring of sensitive sites, cultural resource awareness actions, and maintenance of an extensive cultural resource database. Other administrative procedures have been developed to ensure that major construction activities procedures are similarly managed. Identified sites at the installation are recorded with the Hawaii State Historical and Archaeological Site Files. Cultural resource inventories are maintained by the DPW, Cultural Resources Team.

(2) About seventy percent of the 250 known archaeological sites are subterranean lava tube sites. Site concentrations are located primarily in the eastern and western areas of PTA. Native Hawaiians used lava tubes for shelter, collection of water condensation or percolation, and procurement of birds. The lava tubes were also used as places for collection and processing of natural resources. The Bobcat Trail Habitation Cave is the only PTA site listed on the National Register of Historic Places. The remaining 30 percent of sites include lithic workshops, shrines, and volcanic glass quarries and excavated pit complexes, believed to have been used in attracting and capturing sea birds.

(3) Formal significance evaluations and determinations for archaeological sites at PTA has not taken place except for volcanic glass quarries located on the east side of Red Leg Trail (Garcia and Associates 2002- Archaeological Survey of Training Areas 5 and 21 and Eligibility Evaluations of Volcanic Glass Quarry Sites Vicinity of Redleg Trail (Range 10), U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii). All sites are managed as if formal until determined otherwise. All but a few of the known sites at PTA are prehistoric-era resources related to the historic context, “Traditional Native Hawaiian Adaptations to the Saddle Region, Hawaii Island.” However, potential for contributing important information about historical context varies among property types and complexity.

(4) Archaeological sensitivity (the probability of finding additional sites or structures) appears to be highest on tube-fed Pahoehoe lava flows, older that 2,000 years, based on the known sites of PTA. These areas are concentrated in Training Areas 21, 22 and 23 and, and appear in small patches in Training Areas 3 and 5. Moderate sensitivity areas are predicted in south and northeast portions of PTA. Low sensitivity is expected in much of the impact area and on a’a lava flows.

(5) Use of archaeological sites by troops has the potential to damage these resources. This includes any occupation or use of an archaeological site by troops during military training, or any troop concentrating activity (e.g., bivouac) in areas of high archaeological sensitivity. The operation of vehicles off of trails and roads on PTA presents a serious threat to both surface and subsurface resources on Army lands. The vehicles can tumble and destroy surface features or damage vegetation, causing erosion and consequent destruction of subsurface features. Another potential conflict between training activities and cultural resources at PTA is the inadvertent excavation of archaeological sites. The Historic Preservation Plan for Pohakuloa Training Area (Garcia and Associates 1995) notes that military impacts were visible in only four percent of research plots monitored at PTA under the Army’s ongoing Land Conditional-Trend Analysis program. Soldiers are instructed to report any chance discoveries of previously unknown sites. Many cultural resources sites throughout the range and training areas have been identified. According to the HPP risk assessment, the high and moderate risk areas of PTA are in the vicinity of firing points. See also PTA External SOP.

d. Wildfire Prevention Analysis

(1) Five wildfire areas have been designated based on existing and planned fuel management corridors (see Section 7.6.5 h(2) and Section 4.3). The impact area is not considered because pre-suppression activities there are not possible and resources at risk are largely unknown. Each area was assigned an ignition potential, hazard, and value based upon the best currently available information. The ratings listed below were agreed upon by representatives of the USFWS and USARHAW. The resulting Pre-Suppression Priority map (Figure 13) shows that Kipuka Kalawamauna, Mauna Kea, and Kipuka Alala areas are at highest risk.

Unit A – Kipuka Kalawamauna

Ignition	-	Moderate	Restricted training and maneuvers, fire threat from Puu Anahulu
Hazard	-	High	Heavy shrub fuels mixed with *Pennisetum setaceum*
Value	-	High	22 of 25 total rare and endangered plant species

Unit B – Mauna Kea

Ignition	-	High	Heavy military activity
Hazard	-	Moderate	Fine fuels or shrubs with little understory in discontinuous fuelbeds
Value	-	High	Adjacent to Critical Habitat and Palila core population, and 9 rare and endangered species

Unit C – Kipuka Alala

Ignition	-	Low	No military training, little human activity
Hazard	-	High	Heavy shrub fuels with fine fuels in the understory, few existing firebreaks
Value	-	High	17 of 26 total rare and endangered plant species

Unit D – Redleg Trail

Ignition	-	High	Heavy military activity
Hazard	-	Low	Mostly barren, isolated vegetated areas, fires easily contained
Value	-	Low	2 of 26 total rare and endangered plant species

Unit E – Mauna Loa

Ignition	-	Moderate	Occasional firing of fire prone weapons, little human activity
Hazard	-	Low	Sparsely vegetated and barren lands
Value	-	Low	No known listed species

Unit F – Keamuku

Ignition	-	High	Military activity expected to be heavy, pyrotechnics authorized
Hazard	-	High	Expected removal of grazing will increase fuel load and continuity
Value	-	Low	Several scattered populations of listed species

(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined.

Table 7.6.1
PTA Pre-Suppression Priority

Map Label	*Location*	*Pre-Suppression Priority*
Unit A	Kipuka Kalawamauna	5
Unit B	Mauna Kea	5
Unit C	Kipuka Alala	4
Unit F	Keamuku	4
Unit D	Redleg Trail	2
Unit E	Mauna Loa	1

7.6.5. Fire Protection.

a. Firebreak System.

(1) Given the weather, topography, and fuel conditions which make fire suppression at PTA difficult, the implementation of adequate pre-suppression measures is all the more important for minimizing fire loss. Serviceable access roads and firebreaks should be of highest priority, as they can be reasonably implemented and provide an effective fire management tool when properly planned and maintained.

(2) Existing roads will serve as firebreaks. Pre-constructed firebreaks need to be negotiable by 4WD vehicles to facilitate fire and management access. The recommended standards/requirements for roads and firebreaks for PTA are outlined in Section 4.3. All firebreak/fuelbreak measurements are additive (e.g. a 9 meter firebreak combined with a 25 meter fuelbreak results in firebreak/fuelbreak combination of 34 meters in width).

(3) Most firebreaks at PTA will be combined with a fuelbreak to increase their effectiveness.

(4) Six firebreaks are or will be constructed at PTA (Figure 14).

a. Western Firebreak – This break starts at the Keamuku lava flow and proceeds south along the western boundary of PTA, between Kipuka Kalawamauna and Puu Anahulu, to the 1859 lava flow. It consists of a firebreak combined with a fuelbreak. The firebreak will vary in width, but will never be less than 9 meters across. The associated fuelbreak will vary in width depending on the fuel type through which it is passing. In grassy areas it will be 25 meters wide, while in shrub or forest areas it will be 45 meters wide. Fuels within the fuelbreak will be maintained at less than 20% crown cover. Fuels will be kept discontinuous and pockets of fuels will be removed. The fuelbreak will be monitored annually via calibrated ocular estimation.

b. Northern Firebreak – This break starts on the northern side of the Keamuku flow, travels north along Keekee road to an existing powerline road that runs along the northern side of the installation. It follows this to the eastern boundary of the installation where it turns south and follows the installation boundary to Saddle Road. This firebreak will also be combined with a fuelbreak. The firebreak will be no less than 4.5 meters wide, and the fuelbreak will vary from 25 to 45 meters wide as described above. This break will largely be replaced by the realigned Saddle Road in the future. The roadbed including shoulders will be greater than 4.5 meters wide. The fuelbreak will continue to be maintained along the south side of the road.

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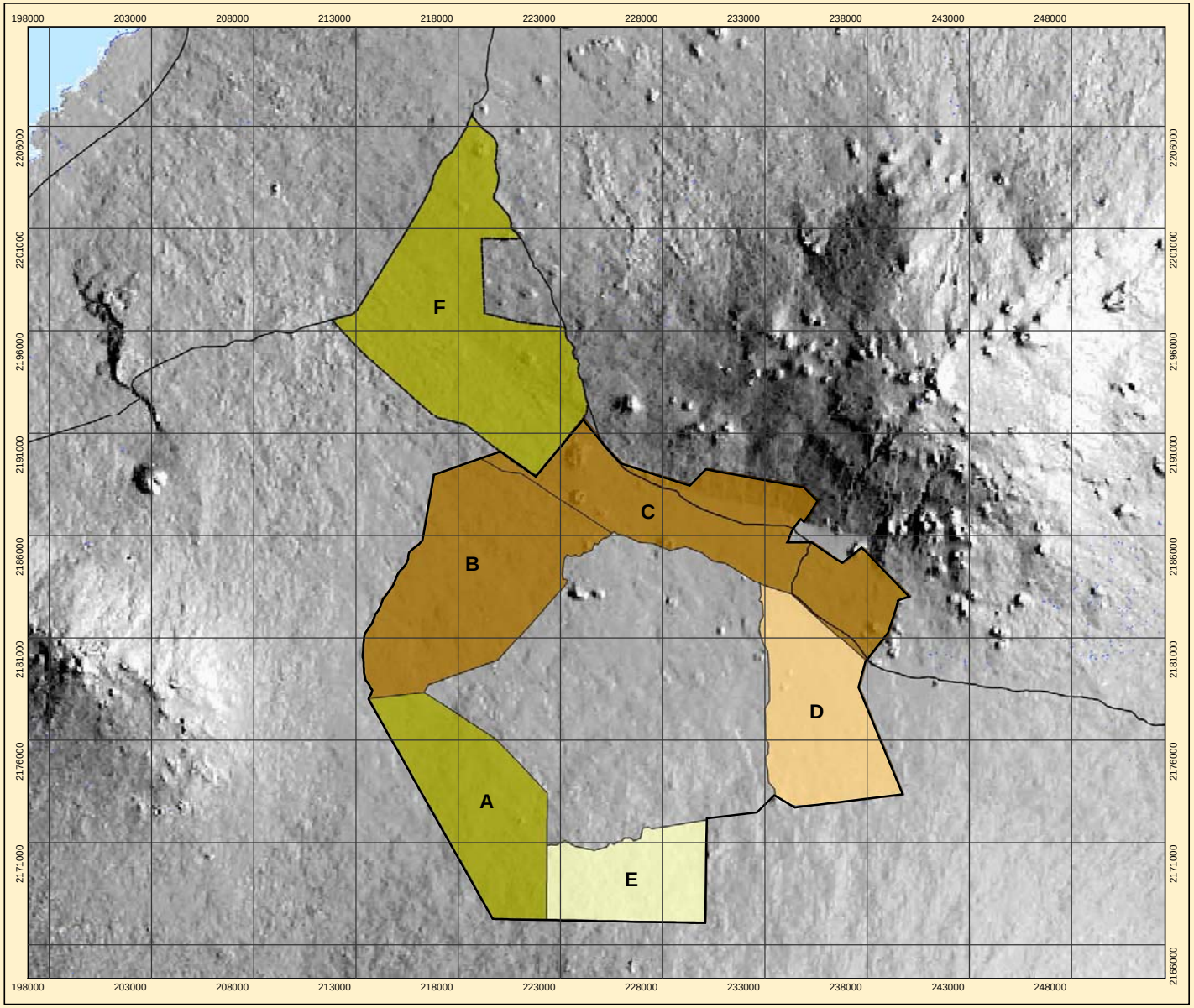


Pohakuloa Training Area
Pre-Suppression Priority

Figure 13

Legend

Pre-Suppression Priority

- None
- Low
- Moderate
- High
- Very High

- Installation Boundary
- Keamuku Parcel
- Surface Water Body
- Primary Roads

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Center for Environmental Management of Military Lands 2003

c. Twin Puus – A firebreak will follow the existing MPRC Access Road to prevent fires from within the impact area from moving into Kipuka Kalawamauna. The firebreak will be 4.5 meters wide. It will not be combined with a fuelbreak, though fuels along the road will be managed via herbicide if populations of listed species are not present.

d. Keamuku – This will extend from the end of the Keamuku flow to Mamalahoa Highway. The firebreak will be 4.5 meters wide and will be combined with a fuelbreak of 25 to 45 meters in width and will be maintained and monitored as described above. The firebreak will be extended as necessary to account for the encroachment of *Pennisetum setaceum* onto the Keamuku lava flow. Extensions will be added wherever crown cover of vegetation exceeds 20%. The flow will be monitored annually as described above.

e. Keamuku Puus – These two firebreaks will be protect Nahaonaehoe cinder cone and Puu Papapa, which harbor a number of listed species, from fires in the Keamuku Parcel. They will be 4.5 meters wide and will not be combined with a fuelbreak. These breaks will be maintained annually.

(6) Two fuelbreaks will be established in Keamuku.

a. Mamalahoa Highway – A fuelbreak of 25 to 45 meters wide will be established on the east side of Mamalahoa Highway within Keamuku. The width will vary depending on the vegetation as described above. Mamalahoa Highway will serve as the firebreak and necessitates no maintenance on the part of the Army.

b. Old Saddle Road – A fuelbreak of the same dimensions will be established along the south side of the existing Saddle Road. It will be maintained annually. The fuelbreak will not be established within Waikii ranch property. The fuelbreak will be monitored annually and maintained as necessary to remain within specifications. The existing Saddle Road will serve as the firebreak.

b. Fuels Modification.

(1) Grasses are the primary fuel related concern as their spread and accumulation increase ignition potential and provide contiguous fine fuel beds. Implementation of road/firebreak improvement and development recommendations will serve to reduce flashy fuels along high ignition risk roads and breakup contiguous fuel beds.

(2) Six fuel management corridors will be established and maintained providing areas through which fire will not carry. These corridors will be aligned so as to provide several distinct areas of PTA within which fire may be contained. Each corridor will be approximately 100-300m wide, though terrain, safety concerns, or protected resources may constrain the width in some areas. Fuel specifications within the corridor require that canopy cover not exceed 20%. This will be determined via a scientifically accepted method of ocular estimation.

(3) All of these corridors are located in locales with little or no existing fuel. They will be monitored once every 5 years, beginning in 2005, to determine whether fuels management needs to be initiated. Once management has begun, these corridors will be monitored biannually and treated whenever necessary to remain within specifications.

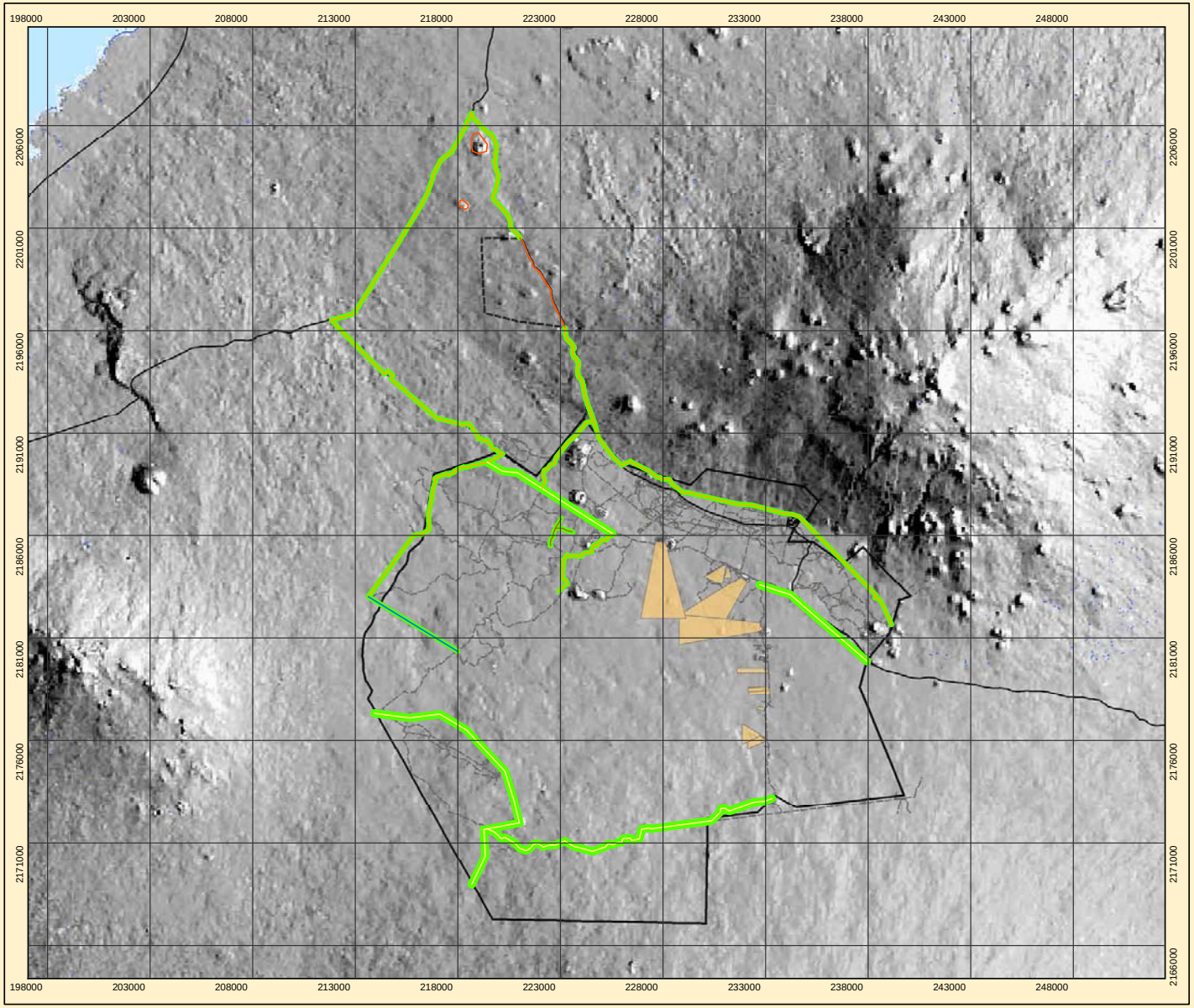
(4) Prescribed burning will also be considered as a future fuels management option. It will be focused on areas dense in exotic grasses, such as far western Kipuka Kalawamauna and the Twin Puus.

(5) Grazing will be considered as an option to control fuels within fuelbreaks. It will also be considered in the event to control fuels throughout the Keamuku Parcel, should that land be acquired by USARHAW.

7.6.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
NA010942J	Rpr/Main PTA West Firebreak (Phase I)	**70**	ITAM	O3
TA100013J	Construct New PTA West Firebreak (Phase II)	**500**	DPW ENV	O4
TA100023J	Construct New PTA North Fuelbreak (Phase III)	**575**	DPW ENV	O4
TA100033J	Construct 3 New PTA Dip Tanks	**325**	DPW ENV	O4
TA100043J	PTA Fuel Management Corridors/Vegetation Control	**110**	DPW ENV	O4
TA100053J	Grazing/Bio-Control Pilot Study at PTA/MMR	**90**	DPW ENV	O4
TA100063J	Install New RAWS Unit Keamuku	**18**	DPW ENV	O5
	Total	**1438**		

*See Annex I for the sustainment budget



Pohakuloa Training Area
Firebreaks and Fuels Management

Figure 14

Legend

Firebreaks
- Firebreak
- Fuelbreak/Firebreak
- Understory Fuelbreak
- Fuel Management Corridor
- Fire Access Road/Fuel Management

Herbicides

Installation Boundary
Keamuku Parcel

Ranges

Surface Water Body

Roads
- Primary
- Secondary
- Tertiary
- Unimproved

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Table 7.6.2
Federally Listed Endangered and Threatened Species
At Pohakuloa Training Area*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:		
Endangered	Fragile fern	*Asplenium fragile* var. *insulare*
Endangered	Honohono, Hawaiian Mint	*Haplostachys haplostachya*
Endangered	Kio`ele, leather leaf sweet ear	*Hedyotis coriacea*
Endangered	Aupaka	*Isodendrion hosakae*
Endangered	Nehe	*Lipochaeta venosa*
Endangered	Mal'aloa, spotted nettle brush	*Neraudia ovata*
Endangered	Po`e, ihi, ihi makole	*Portulaca sclerocarpa*
Threatened	Hawaiian catchfly	*Silene hawaiiensis*
Endangered	Lanceleaf catchfly	*Silene lanceolata*
Endangered	Popolo, popolo ku mai	*Solanum incompletum*
Endangered	Hawaiian parsley	*Spermolepis hawaiiensis*
Endangered	Creeping mint	*Stenogyne angustifolia*
Endangered	None	*Tetramolopium arenarium ssp. arenarium*
Endangered	Cowpea, Oahu vigna	*Vigna o-wahuensis*
Endangered	A'e, Hawaiian yellow wood	*Zanthoxylum hawaiiensis*
ANIMALS:		
Endangered	Hawaiian Goose, nene	*Branta sandvicencis*
Endangered	Hawaiian Hawk, `io	*Buteo solitarius*
Endangered	`Akiapola`au, honeycreeper	*Hemignathus munroi*
Endangered	Hawaiian hoary bat, 'ope'ape'a	*Lasiurus cinereus semotus*
Endangered	Palila, pooppale, ou-po-opapale	*Loxioides bailleui*
Endangered	Ua'u, Hawaiian Dark-Rumped Petrel	*Pterodroma phaeopygia sandwichensis*

*According to Programmatic Biological Assessment for Transformation of the 2nd Brigade 25th Infantry Division (Light) U.S. Army, Island of Hawaii. April 2003.