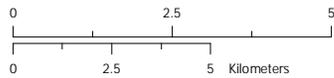


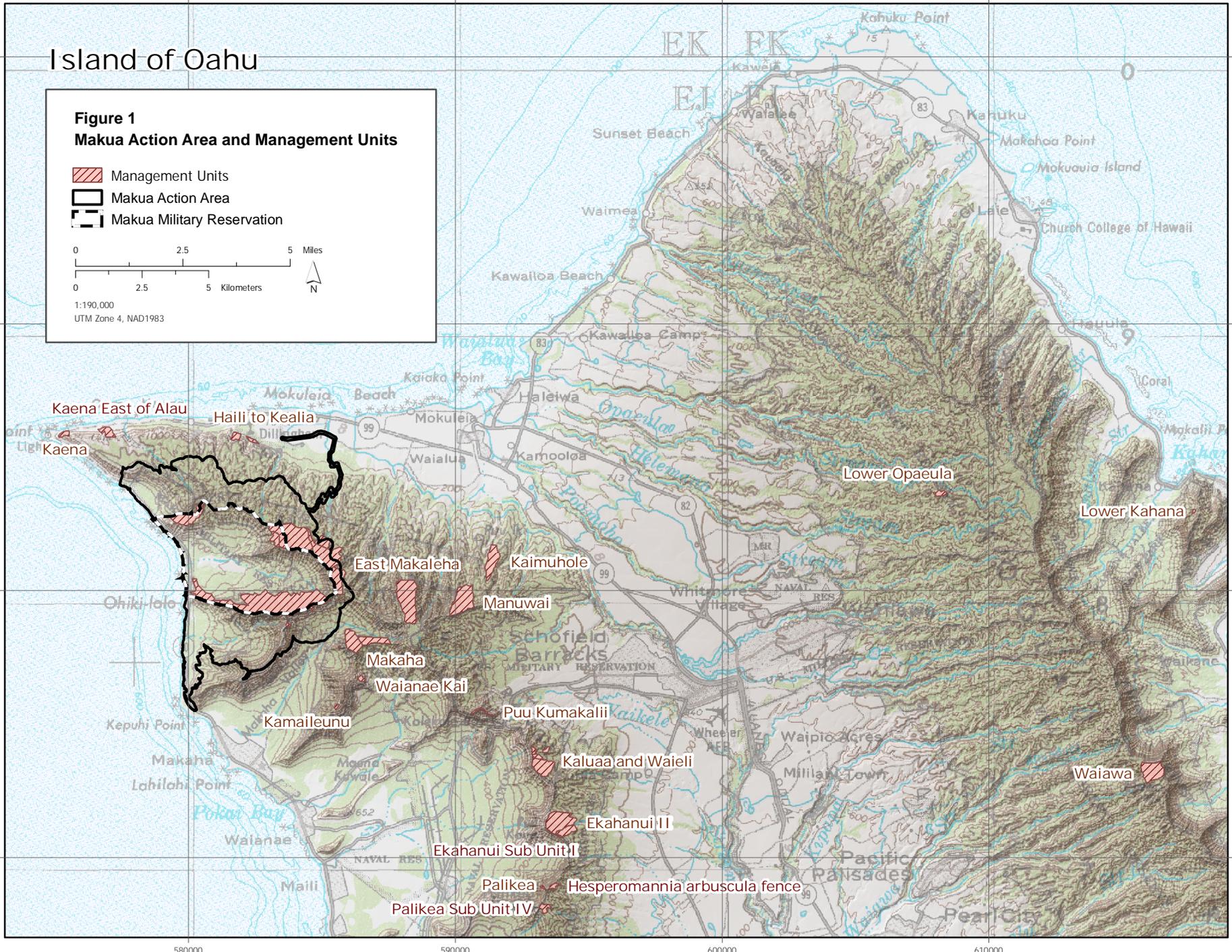
Island of Oahu

Figure 1
Makua Action Area and Management Units

-  Management Units
-  Makua Action Area
-  Makua Military Reservation



1:190,000
UTM Zone 4, NAD1983



located outside of the training area (see Figure 1). These management units are proposed for eventual stabilization of plant and snail species as discussed in the 1999 Biological Opinion and presented in detail in the Makua Implementation Plan and the Makua Implementation Plan Addendum. We have determined that the activities conducted by the Army's Natural Resources Staff will not have any detrimental effect to listed species or designated critical habitat within the "management unit" action area. We came to this conclusion because any threat reduction pursuant to the Makua Implementation Plan (e.g., fence building, ungulate removal, invasive plant removal, rat baiting) that is implemented in these areas will benefit species and critical habitat by enhancing conditions for both the species and the primary constituent elements of the critical habitat. The Army's Natural Resources Staff are trained in resource conservation and they understand that no adverse impacts may result from any proposed work in these areas. If they determine that an action "may adversely affect" a listed species or designated critical habitat, they will coordinate with us prior to implementing that action. The portion of the action area that encompasses the management units outside of the training action area, and the listed species or critical habitat that may overlap or coincide with these areas will not be considered further in this consultation. From here on out, the term "action area" refers to the training action area as depicted on Figure 2.

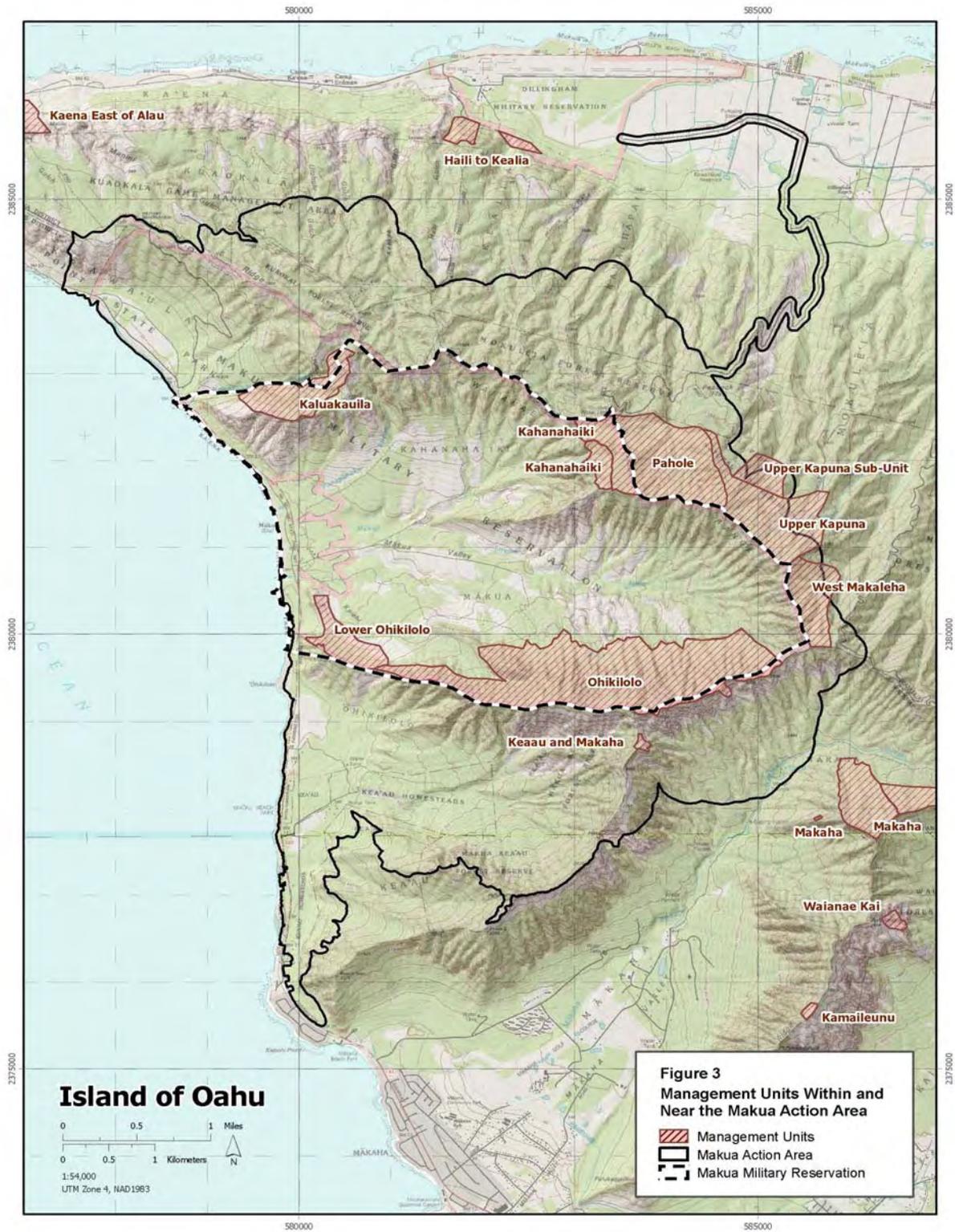
The Service determined the training action area for this consultation by running the fire spread model Fire Area Simulator (FARSITE) (Finney 1998). This model takes into account the area that would be impacted by an unsuppressed fire ignited at the outer perimeter of the potential ignition area for all weapons, with high risk weather conditions. The model calculated fire spread based on hourly inputs of weather data and Geographic Information System (GIS) generated maps of vegetation fuels, canopy characteristics, slope, elevation, and aspect.

The Kuaokala Trail was added to the action area since this area will be utilized by troops as they conduct forced marches. The trail initiates from Dillingham Airfield and terminates at the upper rim of the Makua Valley. These marches will be conducted twice a month also by a company of soldiers. Smoking will not be allowed on the trail and soldiers will be trained to clean shoes and equipment to limit the spread of exotic, invasive plant seeds. The action area associated with the trail is 100 meters (m) (328 feet (ft)) wide, spanning 50 m (164 ft) from the center of the trail.

Management Units

Figure 3 depicts the management units within, or adjacent to, the action area proposed by the Makua Implementation Team and outlined in the Makua Implementation Plan Addendum. Some of these units, such as Pahole (which is operated by the State of Hawaii), were already being managed to protect sensitive species prior to their establishment as a management unit. The Army is implementing management activities such as fencing, ungulate removal and outplanting of listed plant species within the management units. A portion of this work has been conducted pursuant to the Army's obligations as stipulated in the urgent actions that were developed during the three-year period the Makua Implementation Plan was being written and finalized. All of these actions benefit plant and elepaio critical habitat that overlap the management units.





This Biological Opinion will supersede all previous biological opinions and incorporate all modifications to training and natural resources activities that will occur within the action area. For our analysis we have incorporated the Wildland Fire Management Plan, the Makua Implementation Plan Addendum, plus relevant portions of the Makua Implementation Plan for our analysis. A complete administrative record of this consultation is on file at our office.

This reinitiated Biological Opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

CONSULTATION HISTORY

See Appendix B for a complete list of list of individuals mentioned below and their positions within their respective organizations.

July 26, 2005: The Service received a letter of reinitiation outlining proposed changes to training actions at Makua. The Army requested the addition of tracers, illumination munitions, Javelins, inert TOW missiles, 60 mm short-range training ammunition, 155 mm High Explosive (HE) artillery simulators, 2.7-caliber rockets shot from helicopters, training on C-ridge, training with ball ammunition without helicopter support, demolition without helicopter support, and night training. The reinitiation package also included a proposed reduced action area.

August 5, 2005: We received the biological information (companion document to the reinitiation letter) for the plant and animal species that will be affected by the Army’s increased training activities at Makua. This was the start date for the reinitiation.

September 20, 2005: The U.S. Department of the Interior submitted a 15-page comment letter on the “Draft Environmental Impact Statement on Military Training Activities at Makua Military Reservation, Hawaii.” (ER05/0631)

October 3, 2005: Representatives from the Service (Patrice Ashfield, Stephanie Bennett, Patty Walcott, and Jenness McBride) met with Tom Huseman (Makua Range Manager) for a tour of Makua. We also discussed the use of certain weapons at Makua and Mr. Huseman agreed that use of illumination rounds and the Javelin would be inappropriate at a range the size of Makua.

October 14, 2005: Patrice Ashfield, Gina Shultz, Steve Miller, Jenness McBride, Patty Walcott (Service), met with Michelle Mansker, Peter Yuh, Joel Godfrey, Jason Greenlee, Susan Ching (Army) to present our action area that differed from the proposed action area submitted by the Army with the reinitiation package. Our determination increased the action area due to our understanding of the proposed action (long-range, incendiary weapons) and the potential for fire spread due to disturbed grassy vegetation in and adjacent to Makua. We also presented a risk analysis for the endangered plant, *Schiedea nuttallii* outlining our concern that the action as proposed could result in a jeopardy determination for this species. We recommended the removal of tracers, 155 mm artillery, illumination rounds, 2.75-caliber rockets and Javelins from the proposed action.

November 14, 2005: The Service detailed a National Park Service Fire Management Officer (Dawn Greenlee) to assist with the fire related issues pertaining to the Makua consultation.

November 17, 2005: Michelle Mansker, Environmental Resource Manager, relayed to Patrice Ashfield (Service) that Colonel Killian agreed to remove illumination rounds from the list of training weapons at Makua.

December 6, 2005: Without notifying the Service, the Army placed a wooden bridge on the Kaena Trail to allow troop movement on the trail. We notified the Army that construction and use of the bridge was inappropriate prior to completion of the consultation since Kaena Trail was part of the new action.

December 8, 2005: Army biologists (Kapua Kawelo, Susan Ching, and Michelle Mansker) met with Service representatives (Patrice Ashfield, Charmie Dang, Jenness McBride, Stephanie Bennett, and Patty Walcott) for a day to work through problems associated with the data base and to ensure we are using the best available information on species abundance and distribution.

December 15, 2005: Service representatives, Patrice Ashfield, Gina Shultz, Dawn Greenlee met with Army representatives, Michelle Mansker, Gayland Enriques (Army Fire Chief), Jason Greenlee, and Susan Ching to discuss the draft fire suppression helicopter staffing guidelines that could enable fires to be contained under various live herbaceous fuel moisture and weather conditions.

December 27, 2005: The Service received a request from the Army to conduct a prescribed burn outside of the firebreak road in order to fulfill their Settlement Agreement and Stipulated Order to allow concerned citizens access to archaeological sites at Makua. The Army was concerned this type of prescribed burn would be too risky for species and fire fighting personnel.

January 3, 2006: The Service replied to the Army's letter concurring that a "hot" burn outside of the firebreak road was a problem and would require extensive minimization measures.

January 25, 26 and 27, 2006: The annual Makua Implementation Team meetings to discuss the Army's progress implementing the Makua Implementation Plan occurred. Team members represented included: Department of Land and Natural Resources Division of Forestry and Wildlife, Board of Water Supply, The Nature Conservancy, University of Hawaii, U.S. Geological Survey Biological Resources Discipline, the Service, and the Army.

January 30, 2006: The Service received a letter from the Army requesting our review of the Prescribed Burn Plan MMR 06-01, to ensure that the proposed plan was not likely to adversely affect listed species or critical habitat. The burn was proposed for periods of time when the grass in the valley, outside the burn unit, was green, and adequate fire suppression helicopter staffing was proposed so that a spot fire could be contained before listed plants could burn.

February 9, 2006: Andy Beavers (Center for Environmental Military Managed Lands; CEMML), Kapua Kawelo (Army Environmental), Jason Greenlee (Army Wildland Fire Management Officer), Dawn Greenlee (Service) took a field trip to the Kahanahaiki weather station fuelbreak area and the Kaluakauila firebreak site. They later visited the Army wildland

fire crew, led by Scott Yamasaki, completing guinea grass cutting work below the Hibiscus patch in the Lower Ohikilolo Management Unit. They discussed fuelbreak needs for these three areas.

February 24, 2006: The Service (Jeness McBride, Gina Shultz and Patrice Ashfield) presented “expedited stabilization” to Army representatives, Michelle Mansker, Joel Godfrey, and Elena Onaga (Army solicitor) for 12 plant species at risk of extirpation due to increased training activities.

March 1, 2006: At the request of Jason Greenlee and Dawn Greenlee, Nezette Rydell (Warning Coordination Meteorologist, National Weather Service, Honolulu) and Jeffrey Powell (Fire Weather Focal Point, National Weather Service, Honolulu) developed a spot weather forecast system to provide fire weather forecast variables for all individual hours, and a narrative description of any expected diurnal wind shifts for all future prescribed burns at Makua. These new spot fire weather forecasts met the National Weather Service spot fire weather forecast standards.

March 1, 2006: Service representatives Jeness McBride and Patrice Ashfield met with Army biologists (Susan Ching, Kapua Kawelo, and Michelle Mansker) to discuss expedited stabilization as a methodology to allow incendiary weapon use without extirpating plant species from Makua from training related wildfires.

March 8, 2006: A prescribed burn was attempted at Makua when live herbaceous fuel moisture was 122 percent. The Army determined the grass was too green to get a clean burn within the burn unit, so herbicide was sprayed on the grass in the unit to decrease moisture and allow the grass to go brown. Rainfall the night before the burn prevented the burn from being completed.

April 18, 2006: Dawn Greenlee (Service) met with Michelle Mansker and Jason Greenlee (Army) to discuss alternative systems for protecting the Kaluakauila and Kahanahaiki management areas perimeters from fire, shrub restoration test sites, and prescribed burn prescription parameters.

April 27, 2006: Jason Greenlee (Army) and Dawn Greenlee (Service) met with Nezette Rydell (Warning Coordination Meteorologist, National Weather Service) and Jeffrey Powell (Fire Weather Focal Point, National Weather Service), to confirm that the local National Weather Service Office could develop the capability to input “F” type forecast observations into the Makua WIMS weather station for hours when training would be occurring at Makua.

April 27, 2006: LTC Sal Petrovia (Army G3 training), Elena Onaga (Army Solicitor), Joel Godfrey, Michelle Mansker, and Jason Greenlee (Army) met with Gina Shultz, Patrice Ashfield, and Dawn Greenlee (Service) to discuss issues with the proposed Project Description. As a result of the meeting, the use of tracers from helicopters was removed from the Project Description; the Army agreed that only pilots qualified in the use of 2.75-caliber rockets would fire this weapon at Makua; and the Service agreed that maintenance of grass height to one foot or less within 60 m (197 ft) along the inside edge of the south lobe of the firebreak road would provide adequate firebreak protection.

May 3, 2006: Michelle Mansker, Kapua Kawelo, Jason Greenlee, Scott Yamasaki (Army), eight members of the Army wildland fire crew, Colleen Bergmannis (Army ITAM), and Dawn

Greenlee (Service) took a field trip to the Kahanahaiki weather station fuelbreak area, the Kahanahaiki Management Unit, and the Makua valley overlook at the southwest corner of the Pahole Management Unit to discuss various systems to protect the management unit perimeters from fire. A combination of fuelbreaks and firebreaks was selected.

June 1, 2006: Bill Boulet (Installation Safety Office), Elena Onaga (Army Solicitor), Tom Piskel (Army contractor), Jason Greenlee, Peter Yuh, LTC Sal Petrovia, and Michelle Mansker (Army) met with Patrice Ashfield, Jenness McBride and Dawn Greenlee (Service) to discuss weapon firing points and potential ignition areas. A list of weapons was proposed for firing from a point within the north lobe of the firebreak road. An increase in size of the action area was discussed, given the request by the Army to use Javelin and TOW weapons at Makua. As a result of this meeting .50 caliber tracers were removed from the Project Description.

June 21, 2006: Dawn Greenlee (Service) attended a demonstration mortar shoot at Schofield Barracks with Army personnel including the Makua Range Control Supervisor Bert Borja, Tom Piskel (Army contractor), Sammy Houseberg and Jason Greenlee (Army Fire and Safety).

August 17, 2006: Dawn Greenlee (Service) and Andy Beavers (CEMML) complete an updated fuel model map for the Makua area, extending the area covered, refining the accuracy of the polygons, and incorporating the new fuel models published in 2005 by Scott and Bergen.

September 21, 2006: A draft Project Description was sent to the Army for review.

November 2, 2006: The Service received the 2006 Status Reports for the Makua Implementation Plan and the Draft Oahu Implementation Plan prepared by the Army's Environmental Division.

October 18, 2006: Boone Kauffman (Director and Research Ecologist, Institute of Pacific Islands Forestry, USDA Forest Service, Pacific Southwest Research Station, Hilo), Pat Costales (Oahu District Manager, Division of Forestry and Wildlife, DLNR), Francis M. Fujioka (Research Meteorologist, U.S. Forest Service, Pacific Southwest Research Station, Riverside, CA), Andy Beavers (CEMML), Sammy Houseberg (Army Fire and Safety Office), Eric Moller (Army Fire Chief), Jason Greenlee and Michelle Mansker (Army), and Dawn Greenlee (Service) met to discuss updates to the guinea grass fuel model and helicopter staffing requirements made as a result of rates of spread and helicopter productivity on fires observed during the 2006 fire season. Future guinea grass and molasses grass fuel model rate of spread and live herbaceous fuel moisture work, and habitat restoration projects within the Kahanahaiki, Kaluakauila and Lower Ohikilolo management units were discussed.

December 6, 2006: A successful prescribed burn was completed within the south lobe of the firebreak road. The Army followed all of the requirements specified by Prescribed Burn Plan MMR 06-01. Live herbaceous fuel moisture was 163 percent outside the burn unit, and the area inside the burn unit had been browned by herbicide.

December 7, 2006: Patrice Ashfield and Dawn Greenlee (Service) met with Ray Rubinoff (Army, Washington Office) and Michelle Mansker (Army) to discuss various aspects of the Army's proposed project.

January 22, 23, and 24, 2007: The Makua Implementation Plan Team met to discuss progress of Army Natural Resources endangered species conservation efforts pursuant to the Makua Implementation Plan Addendum.

February 1, 2007: The Army provided the Service with written comments on hard copies of the Project Description. Dawn Greenlee (Service) met with Michelle Mansker and Kapua Kawelo (Army) to discuss changes to the Project Description, including the removal of the Kaena point trail from the project, the addition of language that permits future updates to the guinea grass fuel model with subsequent updates to fire suppression helicopter staffing requirements, and provision for the detonation of unexploded ordinance outside the firebreak road.

April 16, 2007: The Service provided the Army with two compact disks containing the draft Project Description. Comments from Army reviewers (Michelle Mansker, Jason Greenlee, Elena Onaga, and G3 trainers) were incorporated the Project Description.

May 3, 2007: Scott Yamasaki (Army Wildland Fire Management Officer) emailed the Service requesting wildland fire related modifications to the Project Description.

May 4, 2007: Dawn Greenlee (Service) met with Scott Yamasaki and Michelle Mansker (Army) to negotiate changes to the Project Description recently proposed by both agencies.

May 15, 2007: Gina Shultz and acting Deputy Field Supervisor Steve Oberholtzer (Service) met with Colonel Killian to discuss the use of tracers from helicopters, the guinea grass fuel model, and helicopter fire suppression. The Army followed up with an email to Gina Shultz that included a written review of their issues and concerns pertaining to the Project Description on May 17, 2007.

May 24, 2007: The Service emailed a response to the May 17, 2007, Army email. The Service agreed to allow small caliber tracers to be shot from helicopters and a reduction in helicopter staffing.

June 4, 2007: Patrice Ashfield (Service) and Michelle Mansker (Army) discussed the problem pertaining to five plant species that are located in a high fire risk area and thus in need of some additional fire minimization measure. It was decided that this measure would be finalized at a later date with the assistance of the Makua Implementation Team.

June 13, 2007: The Service received additional comments on the final Project Description and finalized the last outstanding concerns with Michelle Mansker on June 15, 2007.

For ease of reference, all species (native and non-native) discussed in this Biological Opinion, are listed in Appendix C.