

FINAL // UNCLASSIFIED  
25 September 2018

**PROGRAMMATIC AGREEMENT  
AMONG  
THE U.S. ARMY GARRISON, PŌHAKULOA TRAINING AREA,  
THE U.S. ARMY GARRISON, HAWAII,  
THE HAWAII STATE HISTORIC PRESERVATION OFFICER,  
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
REGARDING  
ROUTINE MILITARY TRAINING ACTIONS AND RELATED ACTIVITIES  
AT UNITED STATES ARMY INSTALLATIONS  
ON THE ISLAND OF HAWAI'I, HAWAI'I**

This version of the Programmatic Agreement **does not** contain protected information and may be publicly released without restriction.

The complete version of this Programmatic Agreement, containing information protected by statute and exempt from public disclosure under the Freedom of Information Act, is on file at the USAG-P and USAG-HI Cultural Resources Offices.

**CLEARED FOR PUBLIC RELEASE**

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ROUTINE MILITARY TRAINING ACTIONS AND RELATED ACTIVITIES AT  
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**WHEREAS**, the U.S. Army Garrison-Pōhakuloa Training Area (USAG-Pōhakuloa) has a mission to support military training through the management and maintenance of Pōhakuloa Training Area (PTA) and Kawaihae Military Reservation on the island of Hawaii in the State of Hawaii; and

**WHEREAS**, PTA is located in the center of Hawaii Island and encompasses portions of four *moku* (districts) and *ahupua'a* (subdistricts), including Humu'ula Ahupua'a of North Hilo District, Ka'ohe Ahupua'a of Hāmākua District, Pu'u Anahulu Ahupua'a of North Kona District, and Waikoloa Ahupua'a of South Kohala District; and

**WHEREAS**, Kawaihae Military Reservation is located on the northwest coast of Hawaii Island in Kawaihae 1<sup>st</sup> Ahupua'a of South Kohala District; and

**WHEREAS**, the USAG-Pōhakuloa is an indirect reporting installation under the mission command of United States Army Garrison, Hawaii (USAG-HI) which maintains oversight of USAG-Pōhakuloa; and

**WHEREAS**, the United States Army Range Division Hawaii (RDH) operates USAG-HI and USAG-Pōhakuloa training areas and ranges in accordance with Army Regulation (AR) 350-19 and under the direction of the USAG-HI and USAG-Pōhakuloa Garrison Commanders, and provides oversight and coordination of training and related activities on Hawaii Island; and

**WHEREAS**, the USAG-Pōhakuloa operates a cultural resources program with a qualified staff of specialists to ensure compliance with applicable laws and regulations; and

**WHEREAS**, pursuant to AR 200-1, the Army has designated the USAG-Pōhakuloa Garrison Commander to serve as the agency official responsible for compliance with the requirements of Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, for undertakings within training areas managed by USAG-Pōhakuloa and operated by RDH; and

**WHEREAS**, in accordance with Section 106 of the NHPA and the implementing regulations at 36 CFR § 800.14(b), this PA governs the implementation of multiple

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undertakings for routine military training and related range management activities associated with the USAG-Pōhakuloa mission and RDH operations; and

**WHEREAS**, undertakings that may be implemented under this PA are described in Appendix A and include: routine military training and routine support activities, and operating, managing, and maintaining Army training areas, ranges, and related infrastructure, and conducting activities to support routine military training; and

**WHEREAS**, routine military training includes those repetitive, recurring types of training regularly conducted at Army installations, as identified and defined in Appendix A; and

**WHEREAS**, this PA applies to undertakings described in Appendix A performed under the direct or indirect jurisdiction of USAG-Pōhakuloa, USAG-HI and RDH by tenant units, non-tenant units, lessees, permittees, and contractors including, but not limited to, the United States Army, Army Reserve, and Army National Guard; other branches of the United States Armed Forces; authorized agents of federal, state or local governments, invited allied forces, and civilian organizations; and

**WHEREAS**, the area of potential effects (APE) for this PA includes the Army installations on Hawai'i Island described in Appendix A, including PTA and Kawaihae Military Reservation; and

**WHEREAS**, routine military training and related activities have been ongoing throughout the installations since the mid-20th century and will continue into the foreseeable future; and

**WHEREAS**, the term "historic properties" includes those prehistoric or historic districts, sites, buildings, structures or objects included in, or eligible for inclusion in, the National Register of Historic Places (NRHP), including properties of traditional religious and cultural significance to Native Hawaiian Organizations (NHOs) that meet the NRHP criteria. Historic properties are those properties that have been formally determined eligible for the NRHP by the appropriate federal agency official in consultation with the State Historic Preservation Officer (SHPO). Properties that have been determined ineligible for the NRHP are not considered to be historic properties; and

**WHEREAS**, in accordance with AR 200-1 Part 6-4(b)(9) those properties that are at least 50 years old and for which no formal determination of eligibility, including properties of religious and cultural significance to NHO, has been made (i.e., unevaluated properties, referred to as potential historic properties) shall be treated as eligible historic properties until formal determinations of eligibility are made; and

**WHEREAS**, most efforts to identify historic properties have been archaeological surveys because most properties identified at PTA have been archaeological sites. Other types of surveys have been conducted but with limited results and therefore the emphasis has been on archaeological site surveys; and

**WHEREAS**, as of the signing of this PA, identification of potential historic properties through intensive pedestrian archaeological surveys have been conducted on approximately 45% of the accessible land (approximately 81,000 acres outside of the high hazard Impact Area) at PTA (Appendix B); and

**WHEREAS**, all of the Army-controlled area at Kawaihae Military Reservation has been subject to intensive archaeological survey and no archaeological historic properties have been identified (Appendix B); and

**WHEREAS**, as of the signing of this PA, approximately 31% of the identified archaeological type properties at PTA have been evaluated for NRHP eligibility. The remaining 69% of known archaeological properties distributed across the accessible land are treated as eligible for the NRHP and adverse effects avoided in accordance with AR 200-1 Part 6-4(b)(9); and

**WHEREAS**, the targeted high-hazard impact area at PTA has been used for high-explosive and incendiary munitions training since the mid-20th century and will continue to be used in this manner; and

**WHEREAS**, the danger of unexploded ordnance in the targeted high-hazard impact area (Appendix A) precludes pedestrian survey for historic property identification and evaluation efforts in that area; and

**WHEREAS**, the USAG-Pōhakuloa has determined that previous military training and related activities have had adverse effects on historic properties in the APE, and that some undertakings may continue to have adverse effects on historic properties in the APE; and

**WHEREAS**, the NHPA defines Native Hawaiian Organizations (NHOs) as “any organization which serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of historic preservation that are culturally significant to Native Hawaiians” (54 U.S.C. § 300314); and

**WHEREAS**, USAG-Pōhakuloa and USAG-HI recognize the U.S. Department of Defense Instruction *Consultation Policy with Native Hawaiian Organizations* (DODI 4710.03) and Advisory Council on Historic Preservation (ACHP) *Handbook on Consultation with Native Hawaiian Organizations* as their guiding principles for consulting with NHOs; and

**WHEREAS**, USAG-Pōhakuloa and USAG-HI acknowledge that NHOs possess special expertise in assessing the eligibility of properties to which they attach religious and cultural significance; and

**WHEREAS**, USAG-Pōhakuloa has consulted with the Office of Hawaiian Affairs (OHA) and other NHOs listed in Appendix H who may attach religious and cultural significance to certain properties in the APE; and

**WHEREAS**, USAG-Pōhakuloa has provided information about this PA to the public through meetings, information posted on the USAG-HI website, and informational forums; has sought public comment and input; and has considered the views of the public in the development of this PA; and

**WHEREAS**, USAG-Pōhakuloa has invited representatives of local governments, and other interested parties to consult regarding the effects of the undertaking on historic properties and they have not participated in consultation; and

**WHEREAS**, USAG-Pōhakuloa has invited the National Park Service and the Historic Hawaii Foundation to consult regarding the effects of the undertaking on historic properties and representatives of those organizations have participated in consultation meetings and provided comments on drafts of the PA; and

**WHEREAS**, in accordance with 36 CFR § 800.6(a)(1), USAG-Pōhakuloa has notified the ACHP of its adverse effect determination, and the ACHP is participating in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

**WHEREAS**, this PA replaces and supersedes the *Programmatic Agreement Among the United States Army Garrison, Hawaii, the Hawai'i State Historic Preservation Office and the Advisory Council on Historic Preservation for Section 106 Responsibilities for the Army Transformation of the 2<sup>nd</sup> Brigade, 25<sup>th</sup> Infantry Division (Light) to a Stryker Brigade Combat Team (SBCT) (2004 as amended)* in its entirety; and

**WHEREAS**, the *Programmatic Agreement Among the United States Army Garrison-Hawaii, the United States Army Garrison-Pōhakuloa, The United States Army Pacific, the Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Development and Operation of the Infantry Platoon Battle Course (IPBC) at Pōhakuloa Training Area, Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island, County of Hawai'i, Hawai'i* shall remain in effect until its expiration, at which time the IPBC and historic properties addressed in that agreement will fall under the jurisdiction of this PA;

**NOW THEREFORE**, USAG-Pōhakuloa, USAG-HI, the Hawaii SHPO, and the ACHP agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties.

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## STIPULATIONS

The USAG-Pōhakuloa Garrison Commander and the USAG-HI Garrison Commander shall ensure that the following stipulations are implemented:

### I. GENERAL

- A. To the extent feasible, USAG-Pōhakuloa and RDH shall develop and authorize undertakings designed to avoid adverse effects to historic properties.
- B. The USAG-Pōhakuloa Cultural Resource Manager (USAG-Pōhakuloa CRM) is responsible for operational administration of the terms of this PA.
- C. RDH is responsible for receiving training on the PA by the USAG-Pōhakuloa CRM, reviewing training requests for PA applicability, coordinating and cooperating with the USAG-Pōhakuloa CRM to fulfill the terms of the PA, ensuring that all units, contractors, lessees, and permittees who use the training areas are aware of and follow the terms of this PA, and providing written notice to the USAG-Pōhakuloa CRM of any deviation from this PA.
- D. The USAG-Pōhakuloa CRM will work with project proponents to redesign undertakings to avoid or minimize adverse effects to historic properties as necessary.
- E. USAG-Pōhakuloa shall follow the standard Section 106 process defined in Subpart B of 36 CFR Part 800 for undertakings that fall outside the scope of this PA (and other applicable agreements), or shall seek an amendment under Stipulation IV.C. to bring the activity within the scope of the PA.

### II. TRAINING AREA ACTIVITY REVIEW

The USAG-Pōhakuloa CRM, in coordination with RDH, shall ensure that undertakings are reviewed and processed according to the following stipulations:

#### A. Undertakings Excluded from Further USAG-Pōhakuloa CRM Review:

- 1. The USAG-Pōhakuloa CRM will not review the following types of routine military training actions and training area management activities because of the nature of the activity and the locations where these activities take place. RDH staff who have received training as specified in Stipulation III.A.3 may authorize these undertakings (as defined in Appendix A and/or illustrated in Appendix D) without further oversight from USAG-Pōhakuloa CRM:

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- a. Physical readiness training;
  - b. Use of existing assembly areas (as illustrated in Appendix D);
  - c. Deployment training;
  - d. Landing zone and drop zone training at established landing zones and drop zones (as illustrated in Appendix D);
  - e. Continued use of existing live-fire training ranges, impact area and firing points (as illustrated in Appendix D);
  - f. Aviation training at existing ranges, impact area and other existing infrastructure (as illustrated in Appendix D);
  - g. Training area configuration, maintenance and repair (no digging) within existing infrastructure footprints;
  - h. Environmental management (no digging).
2. Routine training at Kawaihae Military Reservation (Kawaihae) consists of excluded activities (deployment training and aviation training), and therefore will not be reviewed by USAG-Pōhakuloa CRM. Requests for other types of training and related activities at Kawaihae will be reviewed following the processes established below.
3. RDH staff who have received training as specified in Stipulation III.A.3 shall review all proposed undertakings that do not qualify for exclusion under Stipulation II.A.1 and II.A.2 to determine their applicability under this section.
  - a. The USAG-Pōhakuloa CRM will create maps of the Hawai'i Island installations (Appendix E, Cross Country Mobility Maps) depicting areas that can be used for activities as described in Appendix A ("Go") after RDH review, areas that may be used for Appendix A activities after review by the USAG-Pōhakuloa CRM ("Slow Go"), and areas that are not to be used ("No Go"). The USAG-Pōhakuloa CRM will provide the maps to RDH at least annually, or whenever the maps are revised in accordance with Stipulation V. These maps will be provided in digital and hard copy formats, including formats to be incorporated into geographic information systems, at scales appropriate for use in this stipulation. The classification of areas on the maps is as follows:

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- i. The “Go” areas have been subjected to intensive archaeological surveys and the potential effects of training and support activities described in Appendix A have been taken into account in consultation with the SHPO and Consulting Parties identified in Appendix H.
- ii. The “Slow Go” areas are those where effects of training and support activities on historic properties have not been taken into account in consultation with the SHPO and Consulting Parties. Some of these areas may require historic properties surveys, additional field work to determine NRHP eligibility, and/or consultation with the SHPO and Consulting Parties identified in Appendix H before training and support activities can take place.
- iii. The “No Go” areas contain one or both of two types of properties:
  - (a) historic properties that have been determined eligible for the NRHP and USAG-Pōhakuloa has committed to preservation and avoidance in consultation with SHPO and Consulting Parties identified in Appendix H;
  - (b) potential historic properties identified through survey that have not been evaluated for NRHP eligibility and are therefore avoided in accordance with AR 200-1.
- b. RDH shall determine if Stipulation II.A.3. applies by comparing the location of a proposed undertaking to the Appendix E map provided by the USAG-Pōhakuloa CRM.
- c. RDH may approve undertakings without USAG-Pōhakuloa CRM review if the undertakings are located in the “Go” areas depicted on the Appendix E map and identified in Appendix A as approved for that area.
- d. RDH may approve undertakings without USAG-Pōhakuloa CRM review that are within “Go” areas and in proximity to “No Go” areas on condition that all personnel and vehicles stay out of the “No Go” areas.

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- e. RDH shall forward complete information regarding a proposed undertaking to the USAG-Pōhakuloa CRM at least 90 calendar days prior to initiation of the undertaking for review under Stipulation II.B under the following conditions:
  - i. The proposed undertaking is within a “Slow Go” area and not excluded from further review under Stipulation II.A.1.;
  - ii. The proposed undertaking is within a “Go” area but is not one of the activities approved for that area.
  - iii. The proposed undertaking is within a “No Go” area.

#### **B. Undertakings Reviewed by the USAG-Pōhakuloa CRM**

The USAG-Pōhakuloa CRM shall review all undertakings that do not qualify for exclusion under Stipulation II.A before those undertakings may be authorized by RDH.

- 1. If an undertaking is proposed outside of “Go” areas depicted on the Appendix E maps, the USAG-Pōhakuloa CRM shall:
  - a. Establish the undertaking APE based on reasonably foreseeable effects.
  - b. Determine whether historic properties are present in the APE.
    - i. The USAG-Pōhakuloa CRM shall take the following steps to identify any properties of religious and cultural importance to NHOs:
      - (a) USAG-Pōhakuloa shall provide a description of the undertaking and a description of the APE to SHPO and NHOs on the Consulting Parties list in Appendix H with a request for information about potential properties of religious and cultural significance to NHOs that may be present within the APE.
      - (b) SHPO or NHO Consulting Parties identified in Appendix H shall notify USAG-Pōhakuloa in writing or by email within 30 calendar days of receipt if they want to consult on the identification of potential properties of religious

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and cultural significance to NHOs in the APE. Consultation to identify properties of religious and cultural significance to NHOs may include but will not be limited to the following:

- i. In person meetings
- ii. Email correspondence
- iii. Telephone calls

- (c) USAG-Pōhakuloa CRM shall document consultation efforts and findings in a report as specified in Stipulation II.B.1.b.iv.
  - (d) Other historic property identification efforts (such as archaeological or ethnographic surveys) shall proceed concurrently and coordinated as appropriate in accordance with Stipulation II.B.1.b.ii.
  - (e) If USAG-Pōhakuloa CRM does not receive notice from SHPO and/or NHO Consulting Parties in Appendix H of their intent to participate in the identification of properties of religious and cultural significance to NHOs within the timeframe specified above in Stipulation II.B.1.b.i(b), USAG-Pōhakuloa CRM shall proceed with review of the undertaking without further consultation to identify properties of religious and cultural significance to Native Hawaiians.
- ii. If the APE has not been previously surveyed for other types of potential historic properties, the USAG-Pōhakuloa CRM shall make a reasonable and good faith effort to identify historic properties in the APE using appropriate techniques specified in Appendix F.
  - iii. If no potential historic properties are identified during the efforts described in Stipulation II.B.1.b.i. and ii., USAG-Pōhakuloa shall provide a report of the identification efforts to the SHPO and Consulting Parties identified in Appendix H.

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- (a) If the SHPO or Consulting Parties identified in Appendix H have comments on the adequacy of the identification efforts they shall provide them to USAG-Pōhakuloa in writing by letter or by email within 30 calendar days of receipt of the report.
  - (b) USAG-Pōhakuloa shall consider any timely comments received and shall respond to the commenting party as appropriate.
- iv. If potential historic properties are identified during the identification efforts described above, USAG-Pōhakuloa shall provide a report describing the identification efforts and the properties identified to SHPO and Consulting Parties identified in Appendix H, restricting distribution of sensitive information in accordance with Section 304 of the NHPA, Section 9 of the Archaeological Resources Protection Act and consultation with the party that provided the information.
  - (a) The SHPO and Consulting Parties identified in Appendix H shall provide written comments by letter or email on the adequacy of the identification efforts and eligibility of potential historic properties to USAG-Pōhakuloa in writing by letter or by email within 45 calendar days.
  - (b) If no written communications are received by letter or email from SHPO or Consulting Parties identified in Appendix H within 45 calendar days, USAG-Pōhakuloa shall assume that the parties do not have any comments on the identification adequacy or the assessment of potential historic properties and shall proceed to make determinations of eligibility for the NRHP.

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- (c) If written comments are received USAG-Pōhakuloa shall work with the party or parties to make a final determination, taking no more than 45 calendar days to reach a resolution.
  - (d) USAG-Pōhakuloa shall make determinations of eligibility for the NRHP taking into account the views of the SHPO and Consulting Parties identified in Appendix H, considering the applicable aspects of integrity, and applying the NRHP criteria found in 36 CFR § 60.4.
  - (e) USAG-Pōhakuloa shall summarize the results of the consultations and distribute the summary with the determinations of eligibility to SHPO and Consulting Parties identified in Appendix H.
  - (f) SHPO and/or Consulting Parties identified in Appendix H shall notify USAG-Pōhakuloa in writing by letter or email within 45 calendar days of receipt of the documentation provided in Stipulation II.B.1.b.(iv)(e) to request any additional information or relay any questions or concerns regarding the determinations of eligibility. If there is no response within 45 calendar days USAG-Pōhakuloa shall proceed with review of the undertaking.
  - (g) If SHPO or Consulting Parties identified in Appendix H do not agree with the USAG-Pōhakuloa determination of eligibility, USAG-Pōhakuloa shall consult to resolve the disagreement and shall follow procedures at 36 CFR §800.4(c)(2) if the disagreement cannot be resolved.
- c. USAG-Pōhakuloa CRM shall coordinate with RDH and the proponent to redesign the undertaking or apply appropriate protection measures if historic properties (including potential historic properties) are present within a proposed APE. Protection measures may include, but are not limited to:
  - i. Installing Siebert stakes to mark “No Go” areas,

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- ii. Installing signs to identify specific allowable or prohibited activities or identify designated travel routes,
  - iii. Erecting temporary or permanent fencing around historic properties to prevent encroachment.
- d. Make a Finding of Effect.
- i. If no historic properties (or potential historic properties) are present in the undertaking APE, including the revised APE for those undertakings that have been redesigned to avoid historic properties in accordance with Stipulation II.B.1.c., the USAG-Pōhakuloa CRM shall make a finding of “no historic properties affected”.
    - (a) The USAG-Pōhakuloa CRM shall provide a memorandum of the results to RDH (and the project proponent if applicable) to proceed with the undertaking.
    - (b) The USAG-Pōhakuloa CRM shall document the identification efforts and finding of effect in the Stipulation IV.B annual report.
    - (c) The USAG-Pōhakuloa CRM shall propose updates to applicable appendices for review in accordance with Stipulation V.B. accordingly.
  - ii. If historic properties are present in the undertaking APE and protection measures are sufficient to preserve integrity and prevent alteration of the characteristics that qualify the property for inclusion in the NRHP, the USAG-Pōhakuloa CRM shall make a finding of “no adverse effect”.
    - (a) The USAG-Pōhakuloa CRM shall provide a memorandum to RDH (and the project proponent if applicable) to proceed with the undertaking with required avoidance and/or minimization methods specified.

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- (b) USAG-Pōhakuloa CRM shall document the effort for Stipulation IV.B annual report.
  - (c) The USAG-Pōhakuloa CRM shall propose updates to applicable appendices for review in accordance with Stipulation V.B. accordingly.
- iii. If historic properties are present and the USAG-Pōhakuloa CRM determines that minimization and/or protection measures will not be sufficient to preserve the integrity of the historic property, the USAG-Pōhakuloa CRM shall notify RDH and the project proponent of a proposed “adverse effect” finding.
  - (a) The USAG-Pōhakuloa CRM shall provide a memorandum to the RDH with a recommendation to either cancel the proposed undertaking or revise it to avoid historic properties.
  - (b) If RDH and the proponent need to advance the undertaking as proposed, the USAG-Pōhakuloa CRM shall make a finding of “adverse effect” and conclude the review in accordance with 36 CFR § 800.6(b)(1) in consultation with the SHPO and Consulting Parties identified in Appendix H.
    - (i) The USAG-Pōhakuloa CRM shall initiate consultation to resolve adverse effects within 15 calendar days of making the adverse effect finding.
    - (ii) The consultation shall include one or more meetings among USAG-Pōhakuloa, the SHPO, and Consulting Parties identified in Appendix H to discuss the resolution of adverse effects.
    - (iii) Resolution of adverse effects developed in consultation with the SHPO and Consulting Parties identified in Appendix H will be documented in a Memorandum of Agreement (MOA) between USAG-Pōhakuloa and the SHPO.

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- (iv) Options for resolution of adverse effects may include but are not limited to:
    - (a) Data recovery at archaeological sites guided by a formal data recovery plan;
    - (b) Additional protection measures such as buffer zones established through consultation or training avoidance “minefields”;
    - (c) Gathering and synthesizing information such as oral histories and archival documents from NHOs who may have knowledge about properties of traditional religious and cultural significance within the APE;
    - (d) Documentation of other property types through appropriate methods in accordance with the Secretary of the Interior’s Standards and Guidelines for Documentation.
  - v. The USAG-Pōhakuloa CRM shall document the finding and the resolution of adverse effects for the Stipulation IV.B. annual report.
  - vi. The USAG-Pōhakuloa CRM shall propose updates to applicable appendices for review under Stipulation V.B. accordingly.
- 2. If a routine type of training or support activity that currently takes place at PTA is proposed within a training area where it is not routinely conducted (as described in Appendix A), the USAG-Pōhakuloa CRM shall:
  - a. Establish the APE based on reasonably foreseeable effects.
  - b. If the location is outside of the “Go” areas on the Appendix E maps, the USAG-Pōhakuloa CRM shall follow the steps outlined in Stipulation II.B.1.

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- c. If the location has been identified for other training activities as a “Go” area on the Appendix E map the USAG-Pōhakuloa CRM shall assess potential effects of the new activity on any historic or potential historic properties identified within the APE and follow the steps outlined in Stipulation II. B.1.c.
3. If a new type of training or support activity is proposed to become routine, USAG-Pōhakuloa shall follow Stipulation II.B.1. and at the conclusion of that consultation shall propose an amendment to the PA per Stipulation IV.C of the PA.

### **C. Undertakings Involving Unexploded Ordnance**

Investigation and disposal of unexploded ordnance (UXO) are critical aspects of training area management, but the risks associated with these types of undertakings preclude standard field survey efforts to identify historic properties and potential effects in the vicinity of suspected UXO.

1. When suspected UXO is found in a training area and reported to RDH, RDH will notify the explosive ordnance disposal (EOD) team, and provide the location of the discovery to the USAG-Pōhakuloa CRM.
2. The EOD team will investigate to identify the item, determine if it is hazardous, and decide whether it can be removed or must be destroyed in place. Investigations may include digging with hand tools around the item to expose and identify critical components.
3. While the EOD investigation is ongoing, the USAG-Pōhakuloa CRM will review existing records to determine what is known about the location, if historic properties may be affected, and if protective measures are appropriate to minimize potential effects.
4. Protective measures may include placing sand bags or other material around a suspected UXO to reduce the blast radius and/or installing sand bags or other material in front of a vulnerable aspect of historic properties to prevent damage from the UXO disposal.
5. The EOD team shall remove the item if it is safe to do so. If the item cannot be safely removed, the EOD team shall employ protective works if they are determined to be necessary by the USAG-Pōhakuloa CRM, and shall destroy the item in place.
6. After removal or destruction of the UXO and if the area is safe to enter, the USAG-Pōhakuloa CRM shall follow-up with identification efforts if the area has not been surveyed, or a condition assessment if historic properties (or potential historic properties) are present.

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- a. The USAG-Pōhakuloa CRM shall document the EOD activity and any identification efforts in the Stipulation IV.B report.
- b. The USAG-Pōhakuloa CRM shall update or propose modifications to applicable appendices in accordance with Stipulation V.B. accordingly.

### **III. ACTIVITIES TO SUPPORT PROJECT REVIEWS**

#### **A. Staffing and Funding**

- 1. All identification, evaluation, and treatment efforts shall be conducted under the supervision of personnel who meet applicable professional qualifications.
  - a. Agency personnel who conduct identification, evaluation, or treatment of historic resources shall meet the qualification standards established by the Office of Personnel Management for their respective disciplines in accordance with Section 112 of the NHPA (54 U.S.C. 306131).
  - b. Contractors who conduct identification, evaluation, or treatment of historic resources on behalf of USAG-Pōhakuloa shall meet Secretary of Interior's Professional Qualification Standards for their respective discipline (36 CFR Appendix A to Part 61) or shall work at the direction someone who meets those standards.
- 2. USAG-Pōhakuloa and USAG-HI shall annually, for the life of this PA, request funding to fulfill mitigation commitments, conduct cultural resource inventory and evaluation, conduct site visits and condition assessments, provide education and training about NHPA requirements, complete reporting requirements, curate artifacts, maintain records of surveys and historic properties, and implement any other terms and conditions of this PA.
- 3. The USAG-Pōhakuloa CRM shall provide training to RDH staff regarding their roles and responsibilities under this PA and the requirements of the NHPA in general. The USAG-Pōhakuloa CRM shall provide this training at least annually, and within 60 days of arrival of a new RDH staff member with responsibilities under this PA.

#### **B. Identification and Evaluation of Historic Properties**

- 1. Identification and evaluation methods will follow procedures described in Appendix F.

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2. Following procedures in Appendix F, USAG-Pōhakuloa CRM will continue historic property identification efforts in those accessible portions of PTA that have not been subject to intensive archaeological surveys and are currently used, or that are newly identified for use, for training actions and related activities.
3. Following procedures in Appendix F, USAG-Pōhakuloa CRM will continue to conduct historic property evaluations in the training areas and will prioritize evaluation efforts based on training priority, the nature of training in the vicinity of the property, potential for reduction of training area fragmentation, and other issues of concern identified in consultation with the SHPO and Consulting Parties identified in Appendix H.
4. USAG-Pōhakuloa shall submit reports of identification and evaluation efforts for review to the SHPO and Consulting Parties listed in Appendix H in accordance with the report review procedures defined in Stipulation II.B.1.b. above.

**C. Historic Property Condition Assessment**

1. The USAG-Pōhakuloa CRM shall routinely assess the condition of historic properties in the APE. The purpose of historic property condition assessments is to document the nature and extent of any effects or changes over time, whether from training and related activities, natural forces, or other causes; to evaluate the effectiveness of protection measures, ensure that any protection measures are intact, repair protection measures as appropriate; and to provide Consulting Parties identified in Appendix H with assurances that historic properties are being managed appropriately. Condition assessments will not be used to evaluate NRHP eligibility, but results of condition assessments may indicate the need for a reconsideration of eligibility.
2. USAG-Pōhakuloa shall, in consultation with SHPO and Consulting Parties identified in Appendix H, develop a historic property condition assessment plan within eighteen months of execution of this PA, including a list of historic properties to assess, a schedule for condition assessments, and procedures for distributing the results of the assessments.
3. The USAG-Pōhakuloa CRM shall document the historic property condition assessments for inclusion in the Stipulation IV.B annual report.

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**D. Programmatic Resolution of Adverse Effects**

1. Certain types of adverse effects cannot be resolved individually and will be resolved programmatically through this PA. These include:
  - a. Adverse effects caused by continued use of the live-fire ranges, including the targeted high-hazard impact area;
  - b. Adverse effects caused by ongoing use of training areas that may occur later in time, be farther removed in distance, or be cumulative;
  - c. Adverse effects associated with investigation and disposal of unexploded ordnance; and
  - d. Adverse effects resulting from emergency situations under Stipulation IV.F., including but not limited to, emergencies declared by the President or the Governor of Hawaii or actions to protect human health and property.
2. The adverse effects listed above are resolved through implementation of the following programmatic treatments, which were developed in consultation with Signatories and Consulting Parties identified in Appendix H:
  - a. The USAG-Pōhakuloa, with support from U.S. Army Training Support Systems, shall, in consultation with the parties listed in Appendix H, produce a short educational video featuring NHO representatives, to inform users of the training ranges about the significance of Native Hawaiian cultural resources, the connection between the training areas and the Hawaiian people, and on appropriate ways to show respect for the lands and resources. The video will be required viewing as part of the orientation for all parties prior to accessing the training areas, including but not limited to all units, contractors, lessees and permittees.
  - b. The USAG-Pōhakuloa leadership shall hold listening sessions with Native Hawaiians at least twice annually for the duration of this PA. The location and format may vary depending upon logistics and input from participants. The first meeting will be held within twelve months of the execution of the PA. The guiding principle of these meetings will be to discuss concerns regarding historic properties and may include discussions that lead to the identification of properties of religious and cultural significance to NHOs

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outside of review of an undertaking. USAG-Pōhakuloa shall prepare documentation supporting NRHP evaluation of any such properties in coordination with the parties providing the information. USAG-Pōhakuloa shall follow the review procedures defined in Stipulation II.B.1.b. above in evaluation of properties identified in this manner.

- c. The outgoing USAG-Pōhakuloa Garrison Commander shall brief the incoming Garrison Commander about historic properties at PTA. The Deputy Garrison Commander and the USAG-Pōhakuloa CRM shall support this relay of information, and when there is insufficient overlap for the outgoing Commander to participate take primary responsibility for imparting the information to the incoming Commander.

#### **IV. ADMINISTRATIVE STIPULATIONS**

##### **A. Duration**

1. This PA will expire 15 years from the date of its execution, which is the date the PA is signed by the ACHP.
2. Prior to expiration of the PA, the Signatories may consult to reconsider or renew the terms of the PA and amend it in accordance with Stipulation IV.C.

##### **B. Reporting**

1. USAG-Pōhakuloa shall prepare an annual report listing actions and reviews conducted pursuant to this PA. The reporting period shall be the calendar year from January 1 to December 31.
2. USAG-Pōhakuloa shall distribute the report to Signatories and Consulting Parties identified in Appendix H no later than March 31 of each year.
3. USAG-Pōhakuloa shall make a version of the report without sensitive information available to the general public on the USAG-HI website and shall keep an archive of previous public annual reports available on the website.
4. Distribution to Signatories and Consulting Parties identified in Appendix H may occur by mail, in person, or electronically via email, file transfer, or other means.
5. The report shall address applicable reviews, actions, and other issues over the reporting year, including:

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- a. A list of undertakings reviewed under Stipulations II.B and II.C;
  - b. A list of historic property surveys completed in the reporting year and any newly identified historic properties or potential historic properties;
  - c. A summary of condition assessment efforts in accordance with Stipulation III.B.2;
  - d. The status of the NRHP evaluation process specified in Stipulation III.B.2;
  - e. Any disputes or objections received regarding implementation of the PA and/or potential historic properties, and how they were addressed;
  - f. Any completed or proposed PA amendments or appendix updates;
  - g. Any post-review discoveries or emergency situations;
  - h. Any issues that are affecting or may affect the ability of the USAG-Pōhakuloa to meet the terms of the PA, including any deviations from the PA;
  - i. A summary of PA trainings conducted per Stipulation III.A.3, including training dates and number of participants;
  - j. The status of programmatic resolution commitments in Stipulation III.D.2.
6. USAG-Pōhakuloa shall host a regular meeting with Signatories and Consulting Parties identified in Appendix H to review the implementation and terms of the PA.
- a. The meeting shall occur annually for four years after execution of the PA. During the fourth annual meeting, the parties shall consult to determine the appropriate timeframe for subsequent meetings.
  - b. Each meeting shall occur no earlier than 30 calendar days after distributing the annual report.
  - c. USAG-Pōhakuloa shall document and distribute meeting notes within 30 calendar days of each meeting.

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**C. Amendments**

1. Any Signatory may propose an amendment to this PA by providing written notification of a proposed amendment to the other Signatories. The notice must provide an explanation of the proposed amendment and a justification of the need for such an amendment.
2. USAG-Pōhakuloa shall notify Consulting Parties identified in Appendix H about any proposed amendments. USAG-Pōhakuloa shall request the Consulting Parties to provide input, if any, on the proposed amendment, including whether they may feel a consultation meeting is appropriate for consideration of the proposed amendment.
3. This PA may be amended when such an amendment is agreed to in writing by all Signatories and shall become effective on the date the amendment is signed by the ACHP.
4. A formal amendment is not required for USAG-Pōhakuloa to update appendices as specified in Stipulation V.A. The process for updating appendices is specified in Stipulation V.B.
5. USAG-Pōhakuloa will maintain the most current version of the PA and appendices and make it publically available on the USAG-HI website. Site location maps and other sensitive information will not be made public.

**D. Dispute Resolution**

1. Should any Signatory party object at any time to the manner in which the terms of this PA are implemented, USAG-Pōhakuloa shall consult with such party to resolve the objection. If USAG-Pōhakuloa determines that such objection cannot be resolved, USAG-Pōhakuloa shall:
  - a. Forward all documentation relevant to the dispute, including USAG-Pōhakuloa's proposed resolution, to the ACHP. The ACHP shall provide USAG-Pōhakuloa with its advice on the resolution of the objection within thirty (30) calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, USAG-Pōhakuloa shall prepare a written response that takes into account previous input from Signatories, any timely advice or comments regarding the dispute from the ACHP, and provide all parties with a copy of this written response. USAG-Pōhakuloa will then proceed according to its final decision.

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- b. If the ACHP does not provide its advice regarding the dispute within the thirty (30) calendar day time period, USAG-Pōhakuloa may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the USAG-Pōhakuloa shall prepare a written response that takes into account any comments regarding the dispute from the Signatory parties, and provide all Signatory parties with a copy of such written response.
2. Should any consulting party, or a member of the public, object to the manner in which USAG-Pōhakuloa is implementing the terms of this PA, they may raise their objection to the Garrison Commander. If the objection is relevant to the manner in which USAG-Pōhakuloa is implementing the terms of the PA, USAG-Pōhakuloa shall acknowledge receipt of the objection within thirty (30) calendar days and will attempt to resolve PA compliance objections. When resolution of objections might require an amendment to the PA, USAG-Pōhakuloa will discuss a resolution with Signatories and other Consulting Parties identified in Appendix H. Objecting parties will be notified of programmatic corrective actions to ensure awareness of USAG-Pōhakuloa's efforts to be in full compliance with PA requirements.
  - a. If USAG-Pōhakuloa receives one or more objections that have no relevance to the implementation of the PA, USAG-Pōhakuloa has no requirement to address such objections.
  - b. USAG-Pōhakuloa shall report objections raised under this stipulation that are relevant to the implementation of the PA and the resolution of those objections in the annual report per Stipulation IV.B.
3. USAG-Pōhakuloa's responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

## **E. Termination**

1. If any Signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other Signatories to attempt to develop an amendment per Stipulation IV.C. If within thirty (30) calendar days (or another time period agreed to by all Signatories) agreement on an amendment cannot be reached, any Signatory may terminate the PA upon written notification to the other Signatories.

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2. Once the PA is terminated, and prior to work continuing on these undertakings, the USAG-Pōhakuloa must either:
  - a. Follow the standard Section 106 process defined in Subpart B of 36 CFR Part 800 for each undertaking; or
  - b. Execute a Memorandum of Agreement pursuant to 36 CFR § 800.6; or
  - c. Coordinate through the Army Chain of Command to request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7.
3. USAG-Pōhakuloa shall notify the Signatories as to the course of action it will pursue.

**F. Emergency Situations**

1. If an emergency situation in a training area creates a threat to life or property and precludes project review in accordance with Stipulation II of this PA, the USAG-Pōhakuloa CRM or delegated representative shall notify the Signatories of the emergency situation by email as soon as possible, no later than the first business day following the emergency that the USAG-Pōhakuloa CRM returns to work. Consulting Parties identified in Appendix H shall be notified of the situation within seven (7) calendar days of the USAG-Pōhakuloa CRM returning to work.
2. All rescue and salvage operations necessary to preserve life or property may be conducted immediately.
3. USAG-Pōhakuloa shall make reasonable and prudent efforts in coordination with the USAG-Pōhakuloa CRM to avoid or minimize effects to historic properties during the implementation of emergency response actions.
4. If the nature of the emergency situation allows for such coordination, SHPO and Consulting Parties identified in Appendix H may provide advice or assistance to the USAG-Pōhakuloa within seven (7) calendar days from notification of the emergency.
5. Within thirty (30) calendar days of resolution of the emergency situation, USAG-Pōhakuloa shall submit a report to Signatories documenting the emergency situation, the actions taken, and any historic properties affected. Emergency situations shall also be included in the annual report described in Stipulation IV.B.

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**G. Post-Review Discoveries**

1. In the event that potential historic properties are discovered during the implementation of an undertaking, USAG-Pōhakuloa shall follow the post-review discovery plan (Appendix G).
2. If the discovery includes Native Hawaiian human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony and is located on land owned or controlled by the U.S. Army, USAG-Pōhakuloa shall immediately protect the remains from damage and exposure to the elements and implement the inadvertent discovery regulations of the Native American Graves Protection and Repatriation Act (25 U.S.C. § 32), as specified in 43 CFR § 10.4.

**H. Consulting Parties**

1. A list of Consulting Parties shall be maintained in Appendix H of the PA.
2. Other parties that wish to participate in the PA as Consulting Parties shall submit a request in writing by email or letter to the USAG-Pōhakuloa Garrison Commander to be added to the Consulting Parties under this PA.
3. The USAG-Pōhakuloa Garrison Commander shall notify the USAG-Pōhakuloa CRM upon the decision to add a party to the list of Consulting Parties, and the USAG-Pōhakuloa CRM shall update Appendix H in accordance with Stipulation V.B.3.
4. Any party wishing to be removed from the list of Consulting Parties shall notify USAG-Pōhakuloa CRM in writing by email or letter. USAG-Pōhakuloa CRM shall update Appendix H in accordance with Stipulation V.B.3.
5. In the event that email correspondence or mail sent by US Postal Service is returned to USAG-Pohakuloa as undeliverable, USAG-Pohakuloa CRM shall try to contact the party in question through other means of communication that have been provided. If these are unsuccessful, USAG-Pohakuloa CRM shall seek contact information from the SHPO, OHA, and/or other parties that may reasonably be anticipated to have contact information for the party in question. If all efforts to identify a new email or postal address are unsuccessful, the USAG-Pohakuloa CRM shall document this in a memo to the file, remove the party from the Consulting Parties list and update Appendix H in accordance with Stipulation V.B.3.

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## **I. Anti-Deficiency Act**

The Army's obligations under this PA are subject to the availability of appropriated funds, and the stipulations of this PA are subject to the provisions of the Anti-Deficiency Act (31 U.S.C. § 1341). USAG-Pōhakuloa and USAG-HI shall make reasonable and good faith efforts to secure the necessary funds to implement this PA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the Army's ability to implement the stipulations of this PA, USAG-Pōhakuloa shall consult in accordance with the amendment and termination procedures found in Stipulations IV.C and IV.E of this PA.

## **V. APPENDICES**

### **A. The following appendices are incorporated with this PA:**

Appendix A – Descriptions of Routine Military Training Actions and Related Activities at U.S. Army Installations on Hawai'i Island

Appendix B – Maps and Lists of Surveyed Areas Determined Adequate per 36 CFR § 800.4b and for the Purposes of this PA

Appendix C – List of Historic Properties and Potential Historic Properties within the Area of Potential Effects

Appendix D – Map of Established Areas

Appendix E - Cross Country Mobility Map

Appendix F – Standard Identification, Documentation and Evaluation Methods

Appendix G – Post-review Discovery Plan

Appendix H – Consulting Parties

### **B. Appendices may be updated without formal amendment to this agreement**

1. USAG-Pōhakuloa may update appendices without a formal amendment to the PA.
2. USAG-Pōhakuloa shall update Appendices B and E with information about surveys and Go/Slow Go/No Go areas after completion of the steps outlined in Stipulations II.B, II.C and/or III.B are completed, or other new information warrants a change to the maps. USAG-Pōhakuloa will provide revised appendices to the SHPO for a thirty (30) calendar day review. If there are no objections from the SHPO, USAG-Pōhakuloa shall incorporate the revised appendices and distribute them electronically to Signatories and Consulting Parties identified in Appendix H upon completion of the updates.

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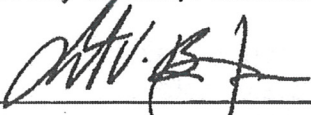
3. USAG-Pōhakuloa shall update Appendix H as requests for additions to or removals from the Consulting Parties list are received. Any updates during the year shall be noted in the Annual Report.
4. USAG-Pōhakuloa or the SHPO may propose modifications to the other appendices as necessary. The proposing agency shall send the modification to the counterpart agency for a forty-five (45) calendar day review period and may host a meeting to discuss the proposal if requested by Signatories or Consulting Parties identified in Appendix H. If the counterpart agency concurs, USAG-Pōhakuloa shall incorporate the revised appendix and distribute it electronically to Signatories and Consulting Parties.
5. In the event of objections, the USAG-Pōhakuloa shall follow the dispute resolution procedures described in Stipulation IV.D.

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Execution of this PA by the USAG-Pōhakuloa, USAG-HI, the Hawaii SHPO, and the ACHP, and implementation of its terms evidence that the Army has taken into account the effects of these undertakings on historic properties and afforded the ACHP an opportunity to comment.

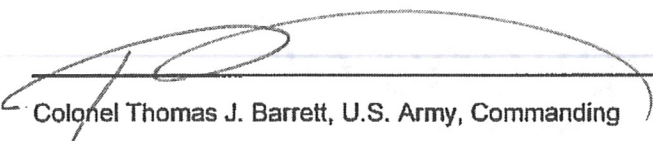
**SIGNATORIES:**

U.S. Army Garrison, Pōhakuloa Training Area

  
\_\_\_\_\_  
Lieutenant Colonel Loreto V. Borce, Jr, U.S. Army, Commanding

Date: 26 SEP 18

U.S. Army Garrison, Hawaii

  
\_\_\_\_\_  
Colonel Thomas J. Barrett, U.S. Army, Commanding

Date: 26 Sept 18

Hawaii State Historic Preservation Officer

  
\_\_\_\_\_  
Ms. Suzanne D. Case, Chairperson, Department of Land and Natural Resources

Date: 26 Sept 2018

Advisory Council on Historic Preservation

  
\_\_\_\_\_  
John M. Fowler, Executive Director

Date: 9/27/18

## Appendix A

Programmatic Agreement Among U.S. Army Garrison, Pōhakuloa Training Area, U.S. Garrison, Hawaii, the Hawaii State Historic Preservation Division, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai‘i, Hawai‘i

# Descriptions of Military Training Actions and Related Activities at U.S Army Installations on Hawai‘i Island

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**Appendix A – Descriptions of Routine Military Training and Related Activities**

## **1. Introduction**

The U.S. Army conducts routine military training and related actions at several installations on the island of Hawai'i.

Section 106 of the National Historic Preservation Act (16 U.S.C. § 470f) requires the Army to consider the effects of those training actions on places that are important in American and Hawaiian history and culture, and to find ways to prevent or reduce harmful effects to those places.

The Army intends to meet the intent of Section 106 by developing and implementing a programmatic agreement (PA) that streamlines review of routine and recurring training and support activities, and programmatically resolves adverse effects that may result from routine training and related actions on Hawai'i Island. The PA has been developed through consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer (SHPO), Native Hawaiian Organizations (NHOs) and other consulting parties, as well as incorporating input from the public-at-large.

This document has been prepared in support of the PA and is intended to provide a general description of routine military training and related actions (the undertaking) that will be taken into account under the PA, along with descriptions of those Army training areas (the area of potential effects) that will be covered by the PA.

***Note: A list of acronyms used in this Appendix is presented in Section 4.2 on page 26. A glossary of terms used in this appendix is presented in Section 4.3 beginning on page 26.***

**Appendix A – Descriptions of Routine Military Training and Related Activities**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

**Appendix A – Descriptions of Routine Military Training and Related Activities****2. Routine Military Training and Related Activity**

For the purposes of the PA, routine military training is defined as those types of training actions regularly conducted in Army training areas. Activities related to military training include configuration, maintenance, and repair of the ranges, facilities, utilities and other infrastructure within training areas; explosive ordnance disposal; cultural resources management; natural resources management; and wildland fire management.

This document addresses routine military training and related activity conducted at two installations on Hawai'i Island. The installations are described in more detail in Section 3.

The locations and extents of the installations are shown in Figure 1 and include:

- Pōhakuloa Training Area (PTA), which consists of
  - Training Areas 1-23
  - Ke'āmuku Maneuver Area (KMA)
  - High Hazard Impact Area
- Kawaihae Military Reservation (Kawaihae)

The Army conducts routine military training both at the individual soldier level and collectively as units. Individual training is the foundation of unit readiness and incorporates the proficiencies of individuals to perform specific tasks related to an assigned position and skill level. This includes individual weapons qualification and a multitude of other tasks required of individual soldiers, such as physical readiness training. Collective training actions are conducted by all Army units, including infantry, aviation, and engineer brigades; combat support and combat service support units; and division artillery.

Other organizations that may conduct training actions in Army training areas may include, but are not limited to:

- Hawai'i Army National Guard
- U.S. Army Reserves
- U.S. Marine Corps
- U.S. Airforce
- U.S. Navy
- Special Operations forces
- Other federal agencies
- law enforcement
- firefighters
- invited foreign allies

Any organization authorized to use Army training areas in Hawai'i will be subject to the requirements of the PA.

**Appendix A – Descriptions of Routine Military Training and Related Activities**

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**Appendix A – Descriptions of Routine Military Training and Related Activities****2.1 Types of Training**

Routine training actions on Hawai'i Island can generally be grouped into the following nine categories, which are discussed in greater detail in the following sections:

- Physical Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Operations
- Force-on-Force Training
- Aviation Training
- Deployment Training
- Landing Zone and Drop Zone Training
- Live-Fire Training

**2.1.1 Physical Readiness Training**

Physical Readiness Training (PRT or PT) is the basic physical conditioning required of each soldier and unit. PRT prepares soldiers for the physical challenges of fulfilling the mission by improving strength, stamina, agility, resilience, and coordination. Training actions consist of individuals or units conducting a variety of conditioning and strength training exercises such as running, lifting, and calisthenics. PRT is conducted at PTA. There is no surface disturbance associated with PRT except during construction or maintenance of obstacle confidence courses.

**2.1.2 Maneuver Training**

Maneuver training is the primary military tactical training and includes battlefield movement by vehicle (mounted maneuvers) and on foot (dismounted maneuvers). Maneuver training is usually conducted at the platoon (16-40 soldiers) or company (100-200 soldiers) level, but may occasionally involve a battalion (500-900 soldiers).

Mounted maneuvers occur on roads and trails and wherever terrain, vegetation density, slope, and administrative factors allow. Off-road maneuvers are only conducted within a portion of PTA known as the Ke'āmuku Maneuver Area (KMA).

Mounted maneuvers are conducted with a wide variety of light, medium and heavy wheeled tactical and logistical vehicles to transport troops, equipment, and supplies. Vehicles range from small four-wheeled Humvees (HMMWVs) to large multi-axel tractor trailers. All Army wheeled vehicles are narrow enough to be driven on public roads.

**Appendix A – Descriptions of Routine Military Training and Related Activities**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

## **Appendix A – Descriptions of Routine Military Training and Related Activities**

Mounted maneuvers may also involve rotary aircraft including a variety of helicopters, such as the UH-60 Blackhawk and CH-47 Chinook, as well as Marine V-22 Osprey tilt-rotor aircraft.

Construction equipment and tracked amphibious vehicles are used at PTA.

Dismounted maneuvers may occur anywhere that safety or administrative restrictions permit but are most frequently conducted along roads and trails with vehicular support.

Maneuver training may entail the use of defensive fighting positions, which can range from soldiers lying in concealed positions, to digging individual fighting positions using hand tools, up to large crew-served weapons emplaced using heavy equipment excavators. The type and size of defensive fighting position is based on the amount of time at a given location. Individual fighting positions are dug by hand and usually encompass at least two square meters and extend from 18 inches to four feet deep. Larger positions for crew-served weapons may be hand-dug or machine-excavated, encompass 20-30 square meters, and be four feet deep or more. Digging and excavation is conducted according to the standard operating procedures (SOP), and is only conducted in areas where historic properties are absent, or have been marked as “no-go” zones.

Where permitted by Army command, units may use blank ammunition while field artillery and mortar fire is simulated by pyrotechnics to provide sound and visual effects to condition units for operations in a battlefield environment. The use of blank ammunition and pyrotechnics is *not* considered to be live-fire. Maneuver training with live-fire is specifically addressed in Section 2.1.10. Maneuver training occurs at many areas on PTA, with the KMA as the primary location.

### **2.1.3 Reconnaissance Training**

Typical reconnaissance training involves small groups of troops, from squad to platoon strength (4 to 40 soldiers), patrolling on foot. This training may take place in all types of terrain, as well as on roads and trails.

In many respects, reconnaissance training resembles dismounted maneuver training, but does not involve excavating large defensive fighting positions and does not have the same type of vehicular support. Small, hasty defensive fighting positions may be constructed using available terrain and natural material to provide temporary shelter and cover. Construction material is limited to dead or downed trees and low-growing vegetation. Rocks may not be used to construct defensive fighting positions. At PTA the SOP requires the use of sand bags rather than rocks.

No live-fire is involved in reconnaissance training although blank ammunition may be used where allowed. Reconnaissance training occurs at PTA.

## **Appendix A – Descriptions of Routine Military Training and Related Activities**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

**Appendix A – Descriptions of Routine Military Training and Related Activities**

**2.1.4 Assembly Area Operations Training**

Assembly area operations training supports the logistical mission of the Combat Support (CS) and Combat Service Support (CSS) units. It entails setting up camp areas, bivouacs, and other logistics for rest, resupply, maintenance, storage, communications, command post, medical facilities, or meal preparation. Assembly areas vary depending on unit size and mission. The size of assembly areas can range from less than two acres for a squad or platoon (4-40 soldiers) to more than 20 acres for a company (up to 200 soldiers).

Depending on unit size and training mission, assembly area sites may contain a vehicle and weapons maintenance area, vehicle parking area, general supply area, munitions supply area, medical area, and vehicle off-loading area. An assembly area site may consist of a series of tents, temporary structures, and equipment. Bivouacs and tents provide sleeping/living areas, command posts, maintenance shops, and supply storage.

Assembly areas are normally located in level or gently rolling areas with vehicle access. Assembly area sites often include security measures such as barbed wire, observation posts, patrols, and defensive positions. Defensive fighting positions at assembly areas are constructed using sandbags and are not dug or excavated. Heavy machinery may be used to unload and position supplies and equipment. Assembly area training occurs at PTA.

Seawater purification training is a component of Assembly Area Training. Seawater purification training is conducted using hoses, pumps, and filters to supply potable water. No digging necessary for seawater purification. Units sometimes request seawater purification capabilities as part of the training scenario at PTA.

**2.1.5 Force-on-Force Training**

A typical force-on-force training involves non-live-fire maneuvers by combat troops over a relatively large area with the involvement and assistance of CS and CSS units. This type of training is often conducted at a large scale involving multiple units from the company up to the battalion level (100-900 soldiers). Occasionally, brigade-level training is conducted with a potential of up to 5000 troops.

Specific military training actions in a force-on-force exercise normally include mounted and dismounted maneuvers, pyrotechnics and artillery simulation devices, constructing defensive positions, emplacing obstacles, establishing support areas or field hospitals, engaging in conflict scenarios and conducting after-action review, inspection, and cleanup. At PTA all of the roads in the training areas are unimproved dirt trails.

Force-on-force training is essentially a combination of maneuver training, reconnaissance training, and assembly area training. Ground disturbance from force-on-force training would be a combination of the individual training actions described previously.

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Large force-on-force training actions are conducted at PTA. Force-on-force training may include maneuver live-fire training as discussed in Section 2.1.10.3.

### **2.1.6 Aviation Training**

Aviation training involves operating and maintaining aircraft, and consists of two parts: aircrew training and maneuver training. Aircrew training involves learning and development of standard flight skills including takeoff and landings, flying techniques, flight operations, and navigation.

Aviation maneuver training involves the use of aircraft to transport ground units, including troops, vehicles, and equipment. Aviation training involves a variety of fixed-wing and rotary aircraft, and unmanned aerial vehicles from all branches of the armed forces as well as state and local government. Additionally, the Marine Corps V-22 Osprey tilt-rotor aircraft may participate in aviation training exercises.

Aviation live-fire training is addressed separately from Aviation Training and included under the Live-Fire Training, section 2.1.10. Based on a national sound abatement program, flight patterns over noise-sensitive areas are set to 2000 feet above ground level. Aviation training occurs at WAAF, DMR, SBMR, KTA, PTA, and in the airspace over and around O'ahu and Hawai'i Island.

### **2.1.7 Deployment Training**

Deployment training teaches soldiers how to prepare and move military units and supplies as part of a military action. Deployment training includes preparation and execution actions, as well as deployment readiness exercises that are designed to evaluate a unit's ability to deploy. Training exercises range from testing the load plan of a specific vehicle to a full-scale deployment exercise designed to simulate the movement plans to an overseas location. Deployment transportation consists of a combination of vehicles, sea transport vessels, and aircraft, depending on the type and location of the deployment training. All units training at PTA participate in deployment training from their home station to PTA. As part of deployment training, vehicle convoys are used to move personnel and equipment on the public roads between Kawaihae Harbor and PTA. Deployment training occurs at Kawaihae and PTA.

### **2.1.8 Landing Zone and Drop Zone Training**

Landing zones (LZs) and drop zones (DZs) are specific locations within the training areas that are used for a variety of training actions.

LZs are used for aircrew training, staging and extracting infantry units on air assault maneuvers, and to train CS and CSS units in support operations. Primary users of LZs are Army, Army National Guard, and Marine Corps units, Army civilian staff, and contractors. Some LZs are

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accessible by established roads and trails and wheeled vehicles may be used in those areas. Other LZs are only accessible by air.

DZs are used for parachute drops of troops and equipment, primarily by Army, Marine Corps, Air Force, Special Operations forces, and Army National Guard units. Vehicles may be used at DZs to recover equipment and personnel. LZ and DZ Training occurs at PTA in established locations.

**2.1.9 Live-Fire Training**

Training conducted with explosives, live ordnance, or ammunition that fires projectiles is considered live-fire training, including Short Range Training Ammunition (SRTA) and paint-marking ammunition (Simunition). Each soldier and weapon system crew has an assigned annual or semiannual live-fire training and qualification requirement.

Live-fire training entails an individual gunner, a weapon system crew, or a collective unit firing at predetermined targets from designated firing positions at a firing range or training facility. Live-fire training involves a variety of munitions, including bullets, rockets, missiles, mines, grenades, explosives, artillery, mortars, and training ammunition.

All live-fire training takes place on specific training ranges established for each type of weapon. All weapons are fired from a firing point into an impact area, which is the area designated for detonation or impact. Explosive and incendiary ammunition is fired into a “high hazard impact area”, which is a smaller zone within an impact area intended to limit the future extent of unexploded ordnance. Impact areas currently used for live-fire training area mapped as the “targeted impact area” and “targeted high-hazard impact area.” When ammunition is fired, a “beaten zone” develops around a target where the majority of ammunition impacts or the explosive material detonates.

Live-fire training at PTA originates from specific training ranges or from aircraft and targets the designated impact areas depending on the type of ordnance.

**2.1.9.1 Small Arms Training**

Small arms are small-caliber, portable munitions including handguns, shotguns, light machine guns, rifles, and carbines designed for individual use. Basic small arms training and marksmanship qualification occurs at designated static firing ranges using standard or training ammunition. Advanced small arms training, including close-quarters combat, occurs within specially designed facilities. Small arms training at these facilities employs various types of training ammunition to limit damage and injury. Small arms training takes place on numerous ranges at PTA.

**2.1.9.2 Weapons System Training**

Weapons systems are either individual or crew-served munitions using larger caliber, incendiary or high-explosive ammunition. Weapons systems may be portable or vehicle-mounted, and

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include heavy machine guns, rocket launchers, shoulder-fired missiles, hand grenades, grenade launchers, mortars, and howitzers. Weapons system training is conducted on large training ranges designed for each weapon. Weapons are fired from designated firing points with a limited and specific impact area for each weapon. High-explosive and incendiary ammunition has the potential to leave unexploded ordnance in the target zone, located in the designated high-hazard impact area. Live-fire weapons system training occurs in designated areas at PTA.

### ***2.1.9.3 Maneuver Live-Fire Training***

Maneuver live-fire training involves troop, vehicle and/or aircraft movement utilizing small arms and weapons-system fire. Requirements for maneuver live-fire training vary depending on individual and unit mission, weapons assigned, and ammunition available. During live-fire maneuver training, some weapons systems are fired from moving vehicles rather than designated firing points. Maneuver live-fire training may also be a component of force-on-force training events. Maneuver live-fire training occurs on the BAX and Infantry Platoon Battle Course (IPBC) at PTA.

### ***2.1.9.4 Demolition and Mine Training***

Demolition training entails the use of explosive material, which is often used to remove obstacles, clear hazardous areas, or eliminate unexploded ordnance (explosive ordnance disposal is treated separately in section 2.2.2.). Mine training allows soldiers to become proficient in the use and removal of anti-personnel or anti-tank land mines. Demolition and mines training occurs at small designated training locations at PTA.

### ***2.1.9.5 Aviation Live-Fire Training***

Aviation live-fire training is conducted on designated ranges with aircraft firing at designated ground targets with guns, rockets, missiles, or bombs. Aviation live-fire at PTA may involve a variety of rotary and fixed-wing aircraft using a combination of ordnance. Aviation live-fire occurs in the impact area at PTA.

## **2.2 Related Actions**

Actions directly related to military training are discussed in detail below and include the following categories:

- Training Area Configuration, Maintenance, and Repair
- Explosive Ordnance Disposal
- Environmental Management (natural resources, cultural resources and wildland fire)

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Training areas and infrastructure must be regularly configured, maintained, and repaired to keep areas functional, ensure safety, and prevent resource damage. Related actions include road and trail maintenance and repair; maintaining and repairing LZs and DZs; grass cutting and other vegetation management; erosion prevention and management; utility and facility repair and maintenance; target placement, configuration, and repair; impact area berm construction and maintenance; firing point construction and maintenance; range cleanup, waste management and pollution prevention.

Configuration, maintenance, and repair does not include construction of new range facilities and infrastructure or expansion of existing range facilities and infrastructure beyond their current footprint.

A variety of Army organizations are responsible for maintaining and repairing training areas, ranges, roads, targets, utilities, and other infrastructure. These organizations include Integrated Training Area Management (ITAM), the Directorate of Public Works (DPW), Range Maintenance, Range Control, Training Support Systems, and Division Engineering. These organizations also provide education on environmental stewardship responsibilities and have compliance and control programs to prevent resource damage, environmental degradation, and unauthorized or inappropriate use of the training areas.

**2.2.2 Explosive Ordnance Disposal**

Explosive Ordnance Disposal (EOD) is a critical component of training area use and management. High-explosive and incendiary ammunition (explosive ordnance) has been used at PTA for more than 50 years, and continues to be used during live-fire training. This type of ammunition has the potential to malfunction and may fail to detonate after firing. In this case the fired munition is referred to as an unexploded ordnance (UXO) or a “dud”. Duds are dangerous and pose a safety hazard because they could explode at any time. EOD staff uses various methods, including explosives, to disarm or destroy UXO. When UXO is identified in active training areas and other places where it may pose a hazard, it is considered imminent danger to life and property and must be safely disposed of as soon as possible. The preferred course of action is to disarm it, remove it, and destroy it in a controlled environment. If UXO poses a hazard and cannot be safely removed, it must be destroyed in place. EOD is conducted on a regular basis within training areas and ranges at PTA.

**2.2.3 Environmental Management**

Environmental management associated with training actions and areas consists of three parts: Cultural Resources, Natural Resources and Wildland Fire. The DPW is the Army organization responsible environmental management and compliance in training areas. The 25<sup>th</sup> Infantry Division and the USAG-HI and USAG-Pōhakuloa Wildland Fire Management Program have the primary responsibility for preventing and fighting wildland fire.

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Cultural resources management involves identification, documentation, and evaluation and treatment of historic-period and traditional Hawaiian cultural resources. Army Regulation 200-1 defines cultural resources as: historic properties as defined by the National Historic Preservation Act (NHPA); cultural items as defined by the Native American Graves Protection and Repatriation Act (NAGPRA); archaeological resources as defined by the Archaeological Resources Protection Act (ARPA); and sacred sites as defined by Executive Order (EO) 13007. Routine cultural resources management often involves shovel tests to locate cultural resources, evaluative testing and sampling to aid in the determining the integrity and significance of a cultural resource; installing barriers, fences, markers and other protective measures around cultural resources; and monitoring cultural resources for potential impacts from training, training-related activity, and other causes.

**2.2.3.2 Natural Resources Management**

Natural resources management plays a crucial role in the Army's ability to conduct training missions; each has the potential to impact the other. Training actions may cause the deterioration of habitat for protected plant and animal species, spread noxious weeds, or cause wildfires. The Army must comply with the Endangered Species Act and conduct training in a manner that does not harm federally listed species and critical habitat. Potential environmental impacts are identified in consultation with the U.S. Fish and Wildlife Service (FWS). Appropriate conservation measures are implemented through the Biological Opinions (BOs) issued by the FWS. The Army's Integrated Natural Resources Management plans describe the management actions necessary to comply with the BOs. Environmental conservation and management measures may include conducting species inventory, monitoring species populations, protecting sensitive species through fencing and other control measures, eradicating noxious weeds or invasive species, installing signs and markers, and replanting native plant species. The USAG-Pōhakuloa Natural Resources program includes a hunting program.

**2.2.3.3 Wildland Fire Management**

The greatest threat to natural resources in training areas is uncontrolled wildland fire. The Army works cooperatively with many agencies to prevent uncontrolled wildland fires. This is accomplished through strict training policies, vegetation management, and prescribed fires. Regular, low-intensity prescribed fires prevent catastrophic wildfires by reducing available fuels, such as dried grasses, in a planned and controlled manner. Prescribed fires also help to maintain the suitability of training areas by preventing overgrowth, maintaining usable space, and reducing the potential to start wildfires during training actions. The Wildland Fire Management Plan has protection measures in place to ensure that firefighting efforts avoid impacts to historic properties. USAG-Pōhakuloa uses managed grazing to reduce fire fuel loads in some areas of PTA.

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### **3. Army Training Areas**

This document addresses two Army installations on the island of Hawai'i (Figure 1).

#### **3.1 *Hawai'i Island***

Training areas on Hawai'i Island are illustrated in Figure 1 and include:

- Kawaihae Military Reservation
- Pōhakuloa Training Area

##### **3.1.1 Kawaihae Military Reserve**

Kawaihae Military Reservation (Kawaihae) is an Army port facility on the northwest side of Hawai'i Island (Figure 1). It is used to transport equipment and supplies to and from training exercises at PTA. Kawaihae is also used for deployment training activity. Routine military training activities conducted at Kawaihae include:

- Deployment Training
- Aviation Training

Kawaihae is a developed port facility and sediment is limited to dumped fill. Facilities at Kawaihae include mooring masts, a ramp and a secured staging area. The road that connects to Kawaihae Road and the breakwater are also part of the area managed by the Army.

##### **3.1.2 Pōhakuloa Training Area (PTA)**

Pōhakuloa Training Area is the largest military installation in the state of Hawai'i, covering more than 130,000 acres (Figures 1). It is subdivided into a high hazard impact area (Impact Area) and 24 training areas: the Ke'āmuku Maneuver Area (KMA) and Training Areas 1-23. Live fire ranges are located along and within the targeted high hazard Impact Area. All types of training actions are conducted at PTA, with live-fire originating from designated ranges and firing points and targeting the Impact Area. PTA has a large battle area complex (BAX) for battalion-size live-fire maneuver training, a large infantry platoon battle course (IPBC) for platoon-size live-fire maneuver training, and a convoy live-fire area that supports mounted maneuver and live-fire training requirements. Bradshaw Army Airfield is located within the PTA Cantonment and is the base of operations for PTA aviation training. The Cantonment is excluded from the area of potential effects for the PA. The discussion here addresses current infrastructure across PTA; older ranges and other infrastructure are present across the training area but if they are not currently tracked by RDH they are not discussed here.

PTA occupies a volcanic desert biome at about 6000-8000 feet above sea level in the rain shadow of Mauna Kea, with the Keamuku Maneuver Area extending to the north to an elevation of about 2,500 feet above sea level at the southwest corner. The Keamuku Maneuver area also receives very little rainfall, but with the Mauna Kea sediments supports predominantly a dry grassland. The remaining 111,000 acres of the training area are predominantly Mauna Loa lava

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flows less than 5000 years old, with a band of Maua Kea deposits across the northern portion of the training area. Vegetation is sparse.

**3.1.2.1 Training Area 1 (TA 1)**

Training Area 1 is a 1,194 acre training area on the northeastern side of PTA. Old Saddle Road is located along the southern boundary of TA 1, and the area has been used for training since PTA was established in 1956. Routine military training actions conducted within TA 1 include:

- Landing Zone Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Physical Readiness Training

TA 1 consists mostly of Mauna Kea deposits of the Laupahoehoe volcanic series, with soils identified as very stony lands with thin soil and many 'a'ā outcrops. The 1843 lava flow extends along the southern boundary of TA 1. Two scoria cones associated with the Laupahoehoe volcanic series are located in the northeast portion of TA 1, Pu'u 'Ōmaokoili and Pu'u Kaena to the southwest. Most of TA 1 is located within Palila critical habitat, and therefore the six firing points located in this area are no longer used. There are dirt roads running through TA 1. The southeast corner of TA 1 is used periodically as a camp site for Boy Scouts.

**3.1.2.2 Training Area 2 (TA 2)**

Training Area 2 is a 1,552 acre training area on the northeastern side of PTA, northeast of TAs 1 and 4. The Daniel K. Inouye Highway runs through the training area on the southwest side, with a narrow strip of TA 2 along the southwest side of the road. TA 2 is completely within Palila Critical Habitat, which limits training in the area, and with the road along the southwest side it is infrequently used by units. Routine military training actions conducted within TA 2 may include:

- Maneuver Training
- Physical Readiness Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training

TA 2 consists of Mauna Kea deposits of the Laupahoehoe volcanic series and alluvium from Waikahalulu Gulch which descends the adjacent slopes of Mauna Kea from the northeast and dissipates in TA 4 to the southwest. There are several unimproved dirt roads within TA 2, including Infantry Road which roughly parallels Daniel K Inouye Highway to the northeast from the northwest boundary to the southeast. There are several cinder cones within TA 2. Two firing points within TA 2 are not used.

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**3.1.2.3 Training Area 3 (TA 3)**

Training Area 3 is a 491 acre training area on the northeastern side of PTA, northwest of TA 1 and southwest of TA 4. Old Saddle Road is located along the southern boundary of TA 3, and the area has been used for training since PTA was established in 1956. Routine military training actions conducted within TA 3 include:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live-Fire Training

TA 3 consists primarily of Mauna Kea deposits of the Laupahoehoe volcanic series, with the 1843 lava flow from Mauna Loa along the southern portion of the training area. Some alluvial deposits are present in the northeastern part of TA 3. TA 3 contains FOB Warrior, LZ Brad and eight artillery firing points. FOB Warrior contains Cooper Air Strip, which is used for unmanned aerial vehicle/unmanned aerial systems (UAV/UAS) training. A portion of TA 3 is within Palila critical habitat, and the firing point in this area is no longer used. In addition to the critical habitat, a small area within TA 3 is enclosed by a conservation fence that protects *Silene hawaiiensis*, Hawaiian catchfly. Dirt roads provide access throughout TA 3.

**3.1.2.4 Training Area 4 (TA 4)**

Training Area 4 is a 1,087 acre training area on the northeastern side of PTA. The Old Saddle Road forms the northwestern boundary of TA 4, with TA 3 on the southwestern side, TA 1 on the southeaster side, and TA 2 on the northeastern side of TA 4. A portion of the northern boundary of TA 4 extends along the edge of Hawaii County's Mauna Kea Recreation Area. TA 4 has been used for military training since PTA was established in 1956. Routine military training activities that take place within TA 4 include:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Live-Fire Training

Slightly less than half of TA 4 is alluvium deposited from Waikahalulu Gulch, which dissipates in this training area, and the remainder if Muana Kea deposits of the Laupahoehoe volcanic series with very stony soil. About three quarters of TA 4 is within Palila critical habitat, and the three

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firing points are no longer used because of this. Training is restricted in the northern edge of TA 4 due to proximity to the Recreation Area. Dirt roads provide vehicular access into TA 4.

**3.1.2.5 Training Area 5 (TA 5)**

Training Area 5 is a 969 acre training area in the northern part of PTA. The Old Saddle Road forms the eastern boundary of TA 5, which has been used for military training since PTA was established in 1956. Routine military training conducted within TA 5 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training

Mauna Loa and Mauna Kea lava flows intermingle in TA 5. A small portion of the 1843 lava flow extends into the southeastern corner of TA 5; the remaining Mauna Loa lava flows date to 1500-3000 years ago. A line of spatter cones extends along the eastern edge of TA 5, parallel to Old Saddle Road. TA 5 contains the Ammunition Storage Point, FAARP 18, and the eastern edge of the BAX. Dirt roads provide access into TA 5.

**3.1.2.6 Training Area 6 (TA 6)**

Training Area 6 is a 687 acre training area on the northern side of PTA. The Old Saddle Road forms the eastern boundary of TA 6 and a portion of the northern boundary, and military training has taken place within the training areas since PTA was established in 1956. Routine military training that occurs in TA 6 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training

The northwestern portion of TA 6 consists of Mauna Kea lava flows of the Laupahoehoe volcanic series, and the southeastern part is Mauna Loa lava flows of the Ka'u volcanic series. Two Ammunition Holding Areas are located within TA 6, and dirt roads provide access throughout.

**3.1.2.7 Training Area 7 (TA 7)**

Training Area 7 is a 1,016 acre training area on the northern side of PTA. The Old Saddle Road forms the northern boundary of TA 7, and military training has taken place within the training area since PTA was established in 1956. Routine military training that occurs in TA 7 includes:

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- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live Fire Training

Both Mauna Kea and Mauna Loa lava flows cross TA 7, with a narrow area of alluvium along Old Saddle Road. The Battle Area Complex (BAX), Tactical Vehicle Wash Facility, and an Ammunition Holding Area are located within TA 7. Most of TA 7 contains the BAX. Firing points within TA 7 are no longer used because of the BAX. Dirt roads provide access throughout TA 7, and provide maneuver corridors for vehicles.

**3.1.2.8 Training Area 8 (TA 8)**

Training Area 8 is a 530 acre training area on the northern side of PTA. The Old Saddle Road forms the northern boundary of TA 8, and military training has taken place within the training area since PTA was established in 1956. Routine military training that occurs in TA 7 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Live-Fire Training

Approximately the northern third of TA 8 is alluvium, the central third is Mauna Kea Laupahoehoe volcanics, and the southern third is Mauna Loa Ka'u volcanics. The BAX covers almost all of TA 8, and firing points within the training area are no longer used because of the BAX. Dirt roads provide access through TA 8.

**3.1.2.9 Training Area 9 (TA 9)**

Training Area 9 is an 832 acre training area on the northern side of PTA. The Old Saddle Road forms the northern boundary of TA 9 and the training area has been used for military training since PTA was established in 1956. Routine military training that occurs in TA 9 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
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- Aviation Training

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- Landing Zone Training
- Drop Zone Training
- Live-Fire Training

TA 9 consists primarily of Mauna Kea Laupahoehoe volcanics, with a small area of alluvium along Old Saddle Road and a small area of Mauna Loa Ka'u volcanics at the southern end of the training area. Pu'u 'Ahi, a cinder cone from the Mauna Kea Laupahoehoe volcanic series, is at the southern boundary of TA 9. The boundary extends across the pu'u. Firing points in TA 9 are no longer used because of the BAX. Drop Zone Mikilua is located within TA 9, and there are observation posts and monitoring equipment on Pu'u 'Ahi. Dirt roads provide access through TA 9.

**3.1.2.10 Training Area 10 (TA 10)**

Training Area 10 is a 1,560 acre training area on the northern side of PTA, on the slopes of Mauna Kea. TA 10 is on the northern side of the Daniel K Inouye Highway and completely within Palila critical habitat. Therefore TA 10 is rarely used for training. Training that is authorized for TA 10 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training

TA 10 consists of Mauna Kea lava flows of the Laupahoehoe and Hamakua volcanic series, with a narrow band of alluvium along the Daniel K Inouye Highway. The water tanks and supporting infrastructure that provide water to the PTA Cantonment are located within TA 10. A switchback footpath begins within TA 10 and ascends Mauna Kea.

**3.1.2.11 Training Area 11 (TA 11)**

Training Area 11 is a 1,047 acre training area on the northern side of PTA. About one third of TA 11 is within Palila critical habitat west of TA 10. Slightly less than one third of TA 11 is a long narrow piece of land that contains three cinder cones. The remainder of TA 11 is on the west side of Bradshaw Army Airfield (BAAF), and the Daniel K Inouye Highway runs through it. Due to these conditions TA 11 is rarely used for training. The Old Saddle Road forms the southern boundary of TA 11, and military training may have taken place in the area after PTA was established in 1956. Routine military training that is authorized for TA 11 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training

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○ Aviation Training

TA 11 consists of Mauna Kea Laupahoehoe volcanic series, alluvial and eolian deposits. The three cinder cones are all of the Laupahoehoe volcanic series. Dirt roads provide access within TA 11, and the Daniel K Inouye Highway passes through the training area.

*3.1.2.12 Training Area 12 (TA 12)*

Training Area 12 is an 855 acre training area on the northern side of PTA. The Old Saddle Road is the northern boundary of TA 12, and the area has been used for military training since PTA was established in 1956. Routine military training that occurs within TA 12 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live-Fire Training

TA 12 consists of Mauna Kea Laupahoehoe volcanic deposits with a small area of alluvium near Old Saddle Road. Three cinder cones are located within TA 12, all of the Laupahoehoe volcanic series. A landing zone, a forward operating base (FOB), and a military operations in urban terrain (MOUT) are located within TA 12. Ten firing points are also located within TA 12, but are not actively used due to conflicts with other activities. Dirt roads provide access throughout TA 12.

*3.1.2.13 Training Area 13 (TA 13)*

Training Area 13 is a 1,193 acre training area on the northern side of PTA. A conservation fence unit is located in the southeastern portion of TA 13. Routine military training that occurs within TA 13 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live-Fire Training
- Drop Zone Training

Approximately the northern two-thirds of TA 13 consists of Mauna Kea lava flows of the Laupahoehoe volcanic series with very stony soil. The Ke'āmuku lava flow, a late pre-Contact Mauna Loa flow of the Ka'u volcanic series covers the southern portion of TA 13. A

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Laupahoehoe volcanic series cinder cone is located in the southwest corner of TA 13. A rock quarry is located within the Ke'āmuku flow. Drop Zone Fisher, seven firing points and a MOUT facility in TA 13. Dirt roads provide access through TA 13 and along the edges of the training area.

### *3.1.2.14 Training Area 14 (TA 14)*

Training Area 14 is a 453 acre training area on the northwest side of PTA. Routine military training that takes place in TA 14 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Live-Fire Training

Training Area 14 consists primarily of Mauna Kea lava flows of the Laupahoehoe volcanic series, with a small portion of the Ke'āmuku lava flow in the southern portion of TA 14. There is a single firing point within TA 14. Dirt roads provide access along the edges of the training area; the terrain is a very rough 'a'ā lava flow camouflaged by vegetation.

### *3.1.2.15 Training Area 15 (TA 15)*

Training Area 15 is a 600 acre training area on the northwest side of PTA. The Old Saddle Road and the Daniel K Inouye Highway pass along the northeastern boundary of TA 15. TA 15 has been used for military training since PTA was established in 1956. Routine military training that is conducted in TA 15 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live-Fire Training

Training Area 15 is comprised primarily of Mauna Kea lava flows of the Laupahoehoe volcanic series with alluvium along the northern boundary where the roads are located and most of the military training infrastructure. The lava consists of rough 'a'ā with vegetation throughout. LZ Yankee, a FOB and nine firing points are located within TA 15. Dirt roads provide access within and along the edges of TA 15.

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**3.1.2.16 Training Area 16 (TA 16)**

Training Area 16 is an 827 acre training area in the northwestern part of PTA. The Old Saddle Road and Daniel K Inouye Highway pass through the northern portion of TA 16, and Pu'u Ke'eke'e dominates the southern part of the training area. Military training has taken place in TA 16 since PTA was established in 1956. Routine military training that is conducted in TA 16 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Live-Fire Training

Most of TA 16 consists of Mauna Kea lava flows of the Laupahoehoe volcanic series, including the Pu'u Ke'eke'e cinder cone. A small portion of the northeastern part of TA 16 is alluvium, and the area along the southern border of the training area south of Pu'u Ke'eke'e is eolian deposits. Antennas and other supporting communications infrastructure is located on Pu'u Ke'eke'e, and there are six firing points in TA 16. Dirt roads provide access throughout TA 16.

**3.1.2.17 Training Area 17 (TA 17)**

Training Area 17 is a 1,253 acre training area in the northwestern area of PTA. TA 17 has been used for military training since PTA was established in 1956. TA 17 is a conservation area to protect threatened and endangered plants and is enclosed within a conservation fence unit. Routine military training that takes place in TA 17 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training

The northern half of TA 17 consists of Mauna Kea lava flows of the Laupahoehoe volcanic series. There is an eolian deposit along the northern boundary of TA 17. Pu'u Kapele is located along the eastern border of TA 17. The southern half of TA 17 is consists of the very rough 'a'ā late pre-Contact Ke'āmuku lava flow from Mauna Loa. There are two small *kīpuka* of older (1,500-3,000 year old) Mauna Loa Ka'u volcanics within this part of TA 17. There are two firing points within TA 17 and an ammunition holding area; the firing points are inactive due to the conservation status of the area. Dirt roads provide access along the boundaries of TA 17.

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**3.1.2.18 Training Area 18 (TA 18)**

Training Area 18 is a 666 acre training area on the western side of PTA. The area has been used for military training since PTA was established in 1956. A portion of TA 18 is enclosed in a conservation fence. Routine military training that is conducted in TA 18 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live-Fire Training

Most of TA 18 consists of Mauna Loa lava flows of the Ka'u volcanic series dating to between 1,500 and 3,000 years ago bordered by the late pre-Contact Ke'āmuku Mauna Loa lava flow along the northeastern side and a small area of Mauna Kea lava of the Laupahoehoe volcanic series in the southwestern portion of the training area. Two cinder cones of the Laupahoehoe volcanic series are located within the southern portion of TA 18. The western part of TA 18, west of the two pu'u, is enclosed in a conservation fence to protect threatened and endangered plants; training in this area is restricted. One firing point and one FAARP are located within TA 18. Dirt roads provide access throughout TA 18.

**3.1.2.19 Training Area 19 (TA 19)**

Training Area 19 is a 1,288 acre training area on the western side of PTA. TA 19 is a conservation area to protect threatened and endangered plants and is enclosed within a conservation fence unit. Routine military training that is conducted in TA 19 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training

A narrow band of the late pre-Contact Ke'āmuku lava flow extends along the northern edge of TA 19. A finger of older Mauna Loa Ka'u volcanic series (1,500-3,000 year old) lava extends from the eastern boundary of TA 19 along the south side of the Ke'āmuku flow across about two-thirds of TA 19. The remainder of the training area consists of Mauna Kea lava flow of the Laupahoehoe volcanic series, a portion of Kīpuka Kalawamauna. There are five firing points within TA 19, but they are inactive due to the conservation status. Dirt roads provide access to TA 19.

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**3.1.2.20 Training Area 20 (TA 20)**

Training Area 20 is a 2,469 acre training area on the western side of PTA. TA 20 is a conservation area to protect threatened and endangered plants and is enclosed within a conservation fence unit. Military training is restricted due to the conservation status. Routine military training that may be conducted in TA 20 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training

Training Area 20 includes the very rough late pre-Contact Ke'āmuku lava flow along the northern portion and extending westward from the eastern boundary through part of the training area, Mauna Kea lava flows of the Laupahoehoe volcanic series, and some areas of older Mauna Loa lava flows of the Ka'u volcanic series (1,500-3,000 years old). The portions south and west of the Ke'āmuku lava flow are part of Kīpuka Kalawamauna. There are five firing points in TA 20, which are inactive due to the conservation status. Dirt roads provide access in TA 20.

**3.1.2.21 Training Area 21**

Training Area 21 is a 11,973 acre training area that extends along most of the eastern side of PTA. TA 21 was part of the High Hazard Impact Area when PTA was established in 1956, by 1979 it had been removed from the Impact Area and contained ranges. TA 21 has been used for military training since PTA was established in 1956. The Old Saddle Road is the northern boundary of TA 21, which extends from that road to the southern boundary of PTA. Most of TA 21 is enclosed in a conservation fence protecting threatened and endangered plants. Routine military training that may be conducted in TA 21 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Live-Fire Training

All of the lava flows in TA 21 are from Mauna Loa except for two cinder cones that are formations of the Laupahoehoe volcanics from Mauna Kea. The majority of TA 21 consists of historic era lava flows of the Laupahoehoe volcanic formation that are more recent than 1790, but substantial areas date to 200-750 years ago (the same age as the Ke'āmuku lava flow) and 750-1,500 years ago. Small areas of older lava are interspersed among the younger lava,

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ranging from 1,500-3,000, 3,000-5,000 and 5,000-10,000 years old. Two small areas in the southern part of TA 21 are identified as the Ninole volcanic series from Mauna Loa, which dates to 100,000-300,000 years ago. A hard packed dirt and gravel road, Red Leg Trail, provides access along the western boundary of TA 21. Two small live fire ranges are located along this road in TA 21, two landing zones are within TA 21, and one ammunition holding area. The Convoy Live Fire Range, designed for vehicles to drive along roads with targets along the sides, extends along the southern quarter Red Leg Trail before turning west into the Impact Area. There are no targets in TA 21 along this range but markers have been placed along it. Several bivouac areas are located at various locations along Red Leg Trail.

**3.1.2.22 Training Area 22 (TA 22)**

Training Area 22 is a 10,731 acre training area that extends along most of the western side of PTA. TA 22 was part of the High Hazard Impact Area when PTA was established in 1956, by 1979 it had been removed from the Impact Area and contained ranges. TA 22 has been used for military training since PTA was established in 1956. TA 22 is a conservation area to protect threatened and endangered plants, and is completely enclosed in conservation fencing that are internally divided into several units. Routine military training that may be conducted within TA 22 includes:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training

A narrow part of TA 22 along the northern boundary is within Kīpuka Kalawamauna, which consists of lava flows of the Laupahoehoe volcanics formation from Mauna Kea. The remainder of TA 22 consists of a series of Ka'u volcanics lava flows from Mauna Loa that date between 750 and 5000 years ago. The 1859 lava flow forms a narrow band along the southwestern boundary of TA 22. The eight firing points in TA 22 are inactive because they are in Kīpuka Kalawamauna, a sensitive ecological area. LZ X-Ray is in TA 22. Dirt roads provide access into TA 22, and firebreak/fire access roads have been added to assist in wildland fire fighting and management.

**3.1.2.23 Training Area 23 (TA 23)**

Training Area 23 is an 11,505 acre training area on the southwestern side of PTA. TA 23 was part of the High Hazard Impact Area when PTA was established in 1956, by 1979 it had been removed from the Impact Area and contained ranges. TA 23 has been used for military training since PTA was established in 1956. About two-thirds of TA 23 is a conservation area protecting threatened and endangered plants and critical habitat for animals, and is enclosed within conservation fence units. The conservation area closely encompasses Kīpuka Alalā. Routine military training that may be conducted within TA 23 includes:

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- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training

TA 23 consists of lava flows from Mauna Loa, primarily three events that date between 750 and 5000 years ago, and the training area is similarly oriented to the direction of the lava flows. The south-southwestern portion of TA 23 is dominated by the 1859 Mauna Loa lava flow with *kīpuka* of earlier lava flows interspersed. An inactive range is located within TA 23. Dirt roads provide access into the northwestern two-thirds of TA 23.

**3.1.2.24 Ke‘āmuku Maneuver Area (KMA)**

Ke‘āmuku Maneuver Area is a 23,051 acre training area that extends northwest from the rest of PTA. The Army purchased KMA from Parker Ranch in 2006 after the area had been used for primarily cattle ranching for more than 100 years, although the area was used during World War II and the Army and Marines periodically leased it for training until the area was purchased by the Army. The Old Saddle Road forms most of the northeastern boundary of KMA, and the Daniel K Inouye Highway passes through the southern portion of KMA and along the southeastern boundary. Māmalahoa Highway is just outside of the northwestern boundary. Waiki‘i Ranch, a residential subdivision, is encompassed by the KMA about midway along the northeastern side. Pu‘u Nohonaohae and Pu‘u Papapā are conservation areas to protect threatened and endangered plants. Routine military training activities conducted in KMA include:

- Physical Readiness Training
- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training
- Drop Zone Training

Most of the KMA consists of lava flows from Mauna Kea, including both Laupahoehoe volcanics and Hamakula volcanics. An area on the eastern side of the southern area of KMA consists of eolian deposits. The late pre-Contact Ke‘āmuku lava flow from Mauna Loa extends along about three-quarters of the southwestern boundary of the KMA, and small portions of the lava flow are within the boundary. Cinder cones are found throughout the KMA, and two of these in the northern part of KMA are encircled by Conservation fences to protect threatened and endangered plants. Another small area in the southern area of KMA is encircled by a conservation fence around a protected plant species. There are 18 landing zones in KMA, three

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drop zones, and a number of areas that have been designated for particular uses to support military training. Dirt roads provide access throughout the KMA.

**3.1.2.25 High Hazard Impact Area**

The High Hazard Impact Area (Impact Area) extends over 51,000 acres in the center of PTA, bordered by TAs 23 and 22 on the west, TAs 18, 13, 9, 8, 7, and 5 across the north, TA 21 on the east, and State land on the south. The center of the Impact Area was targeted with Improved Conventional Munitions (ICM); this area is too dangerous for anyone to enter. Other parts of the Impact Area are high hazard areas but can be entered if individuals wear approved protective gear and are accompanied by explosives ordnance disposal (EOD) specialists. Entry into this area is only by specific requirement. Routine military training that is conducted in the Impact Area includes:

- Maneuver Training
- Reconnaissance Training
- Assembly Area Training
- Force-on-Force Training
- Aviation Training
- Landing Zone Training

All except two of the live fire ranges at PTA are oriented into the Impact Area, as are firing points and aviation live fire training. There are fourteen ranges along the west side of Red Leg Trail oriented west into the Impact Area. Several of these ranges are configured for maneuver training with various sized units, and some contain Landing Zones. The BAX, three FAARPs and three ranges are located across the northern part of the Impact Area. Some of these, like the BAX, are partially within and partially outside of the Impact Area. The BAX is used for both mounted and dismounted maneuver training. The IPBC is on the western side of the Impact Area. The IPBC is primarily a dismounted maneuver training range but may incorporate mounted maneuver training and contains two landing zones. The Convoy Live Fire Range for mounted maneuver training begins south of the small arms ranges on Red Leg Trail and continues along the Hilo-Kona Road into the southeastern part of the Impact Area. Beyond the end of the Convoy Live Fire Range in the Impact Area is additional training infrastructure built by various services. These include an Aerial Scored Bullseye, an Urban Close Air Support Range, an area used for helicopter door gunnery, a mock runway, and an area that overlaps with the ICM for aviation live fire training. There are four high altitude landing zones along the southern boundary of PTA to provide high altitude training for helicopter pilots.

Most of the Impact Area is comprised of Mauna Loa lava flows. There are a few areas in the northern part of the Impact Area that are Mauna Kea lava flows of the Laupahoehoe volcanics, including several cinder cones. Some dirt roads are present in the Impact Area, primarily in the norther portion, within range areas, and the Hilo-Kona Road in the south.

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## 3.2 Training Area Activity Matrix

Training Area: Training Type <sup>1</sup> :	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	KMA
<b>Physical Readiness</b>																								
<b>Maneuver</b>																								
<b>Reconnaissance</b>																								
<b>Assembly Area</b>																								
<b>Force-on-Force</b>																								
<b>Aviation</b>																								
<b>Deployment</b>																								
<b>LZ, DZ</b>																								
<b>Live-Fire</b>																								

<sup>1</sup>The Training Types are based on the types described in this document.

Range Area: Training Type <sup>1</sup> :	Red Leg Trail Ranges	Battle Area Complex	Infantry Platoon Battle Course	High Altitude Landing Zones	Impact Area	Kawaihae Military Reservation
<b>Physical Readiness</b>						
<b>Maneuver</b>						
<b>Reconnaissance</b>						
<b>Assembly Area</b>						
<b>Force-on-Force</b>						
<b>Aviation</b>						
<b>Deployment</b>						
<b>LZ, DZ</b>						
<b>Live-Fire</b>						

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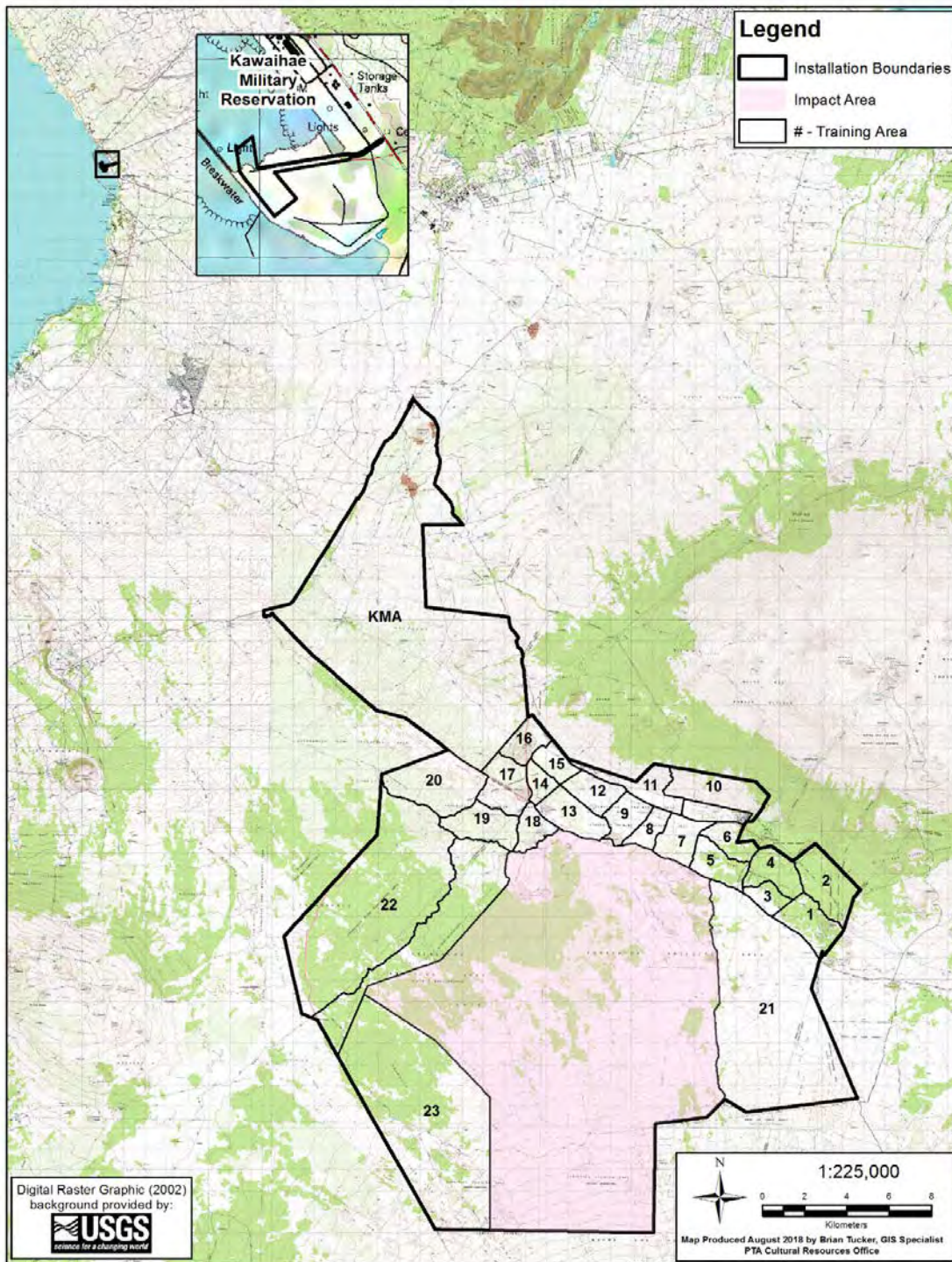


Figure 1. Hawai'i Island US Army Installations, Pōhakuloa Training Area and Kawaihae Military Reservation, with inset of Kawaihae Military Reservation.

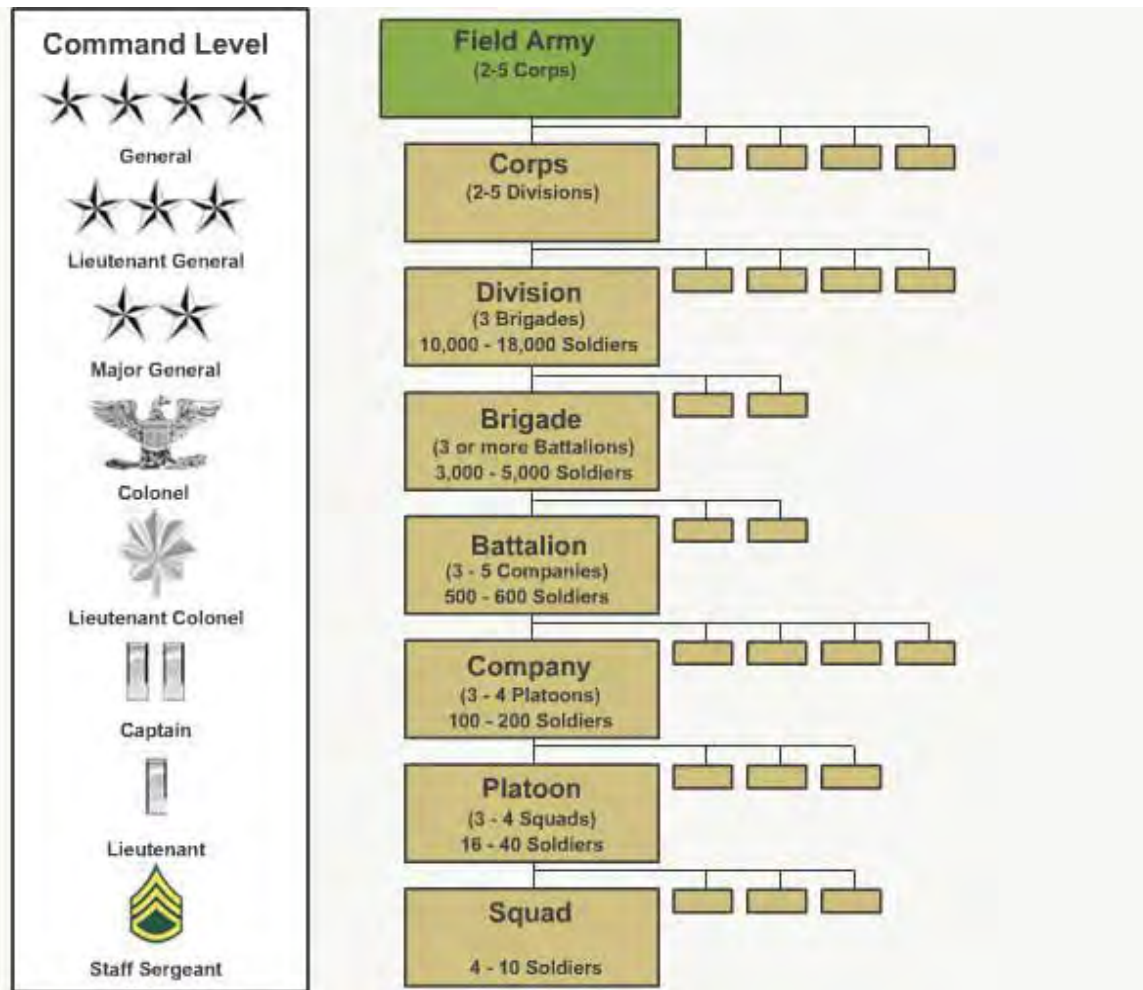
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## 4. References

### 4.1 Army Unit Organization Chart



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## **4.2 Acronyms**

*BAAF*: Bradshaw Army Airfield

*BAX*: Battle Area Complex

*CAB*: Combat Aviation Brigade

*CS*: Combat Support

*CSS*: Combat Service Support

*DPW*: Directorate of Public Works

*DZ*: Drop Zone

*EDRE*: Emergency Deployment Readiness Exercise

*EOD*: Explosive Ordnance Disposal

*ICM*: Improved Conventional Munitions

*IPBC*: Infantry Platoon Battle Course

*ITAM*: Integrated Training Area Management

*KMA*: Ke‘āmuku Maneuver Area

*LZ*: Landing Zone

*MOU*: Military Operations in Urban Terrain

*NCO*: Noncommissioned Officer

*PTA*: Pōhakuloa Training Area

*SOP*: Standard Operating Procedure

*SRTA*: Short-range training ammunition

*USAG-HI*: United States Army Garrison, Hawai‘i

*USAG-Pōhakuloa*: United States Army Garrison, Pōhakuloa

*USFWS*: United States Fish and Wildlife Service

*UXO*: Unexploded Ordnance

## **4.3 Glossary**

*Air Assault* – Movement of assault forces by helicopter to attack the enemy or capture land

*Assault Forces* – Soldiers assigned to combat, combat support, or combat service support roles

*Artillery (Field Artillery)* – Equipment, supplies, ammunition and personnel involved in the use of cannons, rockets or surface-to-surface missile launchers

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*Battalion* – A military unit consisting of three to five companies, approximately 500-900 soldiers; see section 3.1

*Battle Area Complex (BAX)* – A large constructed battlefield training course designed for tactical maneuver and live-fire training at the company and battalion level

*Beaten Zone* – The area on the ground near a target where most ammunition lands

*Blank Ammunition (Blanks)* – A type of training ammunition that contains gunpowder but no bullet or shot. When blank ammunition is fired, it produces a sound and a flash

*Bivouac* – A temporary camp for military lodging during training or operations away from a cantonment or installation.

*Brigade* – A military unit consisting of three or more battalions, approximately 3000-5000 soldiers; see section 3.1

*Cantonment* – The main administrative and residential section of a large military training installation

*Carbine* – A short-barrel rifle, standard issue to U.S. Army soldiers

*Combat Support (CS)* – A military unit that provides operational support and assistance to combat units; Army CS units include Military Police, Military Intelligence, Signal Corps, Chemical Corps, Corps of Engineers, and Army Aviation

*Combat Service Support (CSS)* – A military unit that provide logistical support and assistance to combat units; CSS units provide transportation, maintenance, supply, subsistence, and health services to combat units and soldiers

*Combat Unit* – A military unit organized, trained, and equipped to engage in combat

*Company* – A military unit consisting of three to four platoons, approximately 100-200 soldiers; see section 3.1

*Confidence Course* – An obstacle course used during physical training

*Crew-served Weapon* – Munitions that must be operated by two or more soldiers

*Defensive Fighting Position* – A location used by assault forces to protect against the enemy; may be a simple concealed position, a hand-dug hole, or a machine-excavated emplacement. See *Individual Fighting Position*

*Deployment (operational deployment)* – Moving military forces into and out of an operational area

*Division* – A military unit consisting of three brigades, approximately 10,000 – 18,000 soldiers; see section 3.1

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*Drop Zone* – The geographic area where troops, equipment, and supplies are dropped by parachute

*Dud* – Explosive ordnance that fails to explode; unexploded ordnance

*Dud-producing* – Any type of explosive ordnance that has the potential to fail

*Dudded Impact Area* – An area where explosive ordnance has previously been fired and where unexploded ordnance (UXO) may be present

*Excavation* – Digging with mechanical equipment during military training

*Explosives* – A substance that produces an explosion; may be incorporated into munitions or used in demolition to destroy structures and equipment, or clear areas

*Explosive Ordnance* – All munitions containing explosives

*Firing Lane* – The area within which an aircraft weapon is fired

*Firing Point* – The location from which a weapon is fired

*Grenade* – A small munition thrown by hand or fired from a launching device (grenade launcher); grenades may be explosive, incendiary, chemical, or smoke-producing

*High-Angle Fire* – Munitions delivered from above a target which minimizes the range of the ammunition; helicopters, mortars, and howitzers are capable of high-angle fire

*High-Hazard Impact Area* – The designated location into which explosive ordnance is currently fired and is expected to land, located within a larger impact area

*High-Explosive Ammunition (HE)* – Artillery and mortar fire that contains a substance designed to explode at the targets; explosive ordnance

*HMMWV (Humvee)* – High mobility multipurpose wheeled vehicle

*Howitzer* – A cannon that combines certain characteristics of both guns and mortars, and employs either low- or high-angle fire; the primary weapon of the Artillery Division

*Impact Area* – A designated location within a training area into which ordnance is fired and is expected to land

*Incendiary Ammunition* – Artillery and mortar fire designed to burn or start fires

*Indirect Fire* – Firing on a target using geometric aiming rather than pointing the weapon directly at the target, as with artillery

*Individual Fighting Positions* – Hand-tool created locations for individuals or crew-served weapons. See *Defensive Position*

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*Infantry* – Soldiers trained and equipped to fight on foot; the main land combat force and largest component of the Army

*Infantry Platoon Battle Course (IPBC)* – A constructed battlefield course, smaller than a Battle Area Complex, designed for tactical maneuvers and live-fire training at the platoon or squad level

*Logistical* – Relating to planning and executing movement, maintenance, and communication of military forces. Military operations associated with acquiring, designing, developing, constructing, operating, maintaining, storing, supplying, distributing, and moving military personnel and equipment and providing related services

*Landing Zone (LZ)* – Specified area for landing helicopters to load and/or unload troops and cargo; landing zones may have more than one designated landing sites; also called HLZ (helicopter landing zone)

*Large Caliber* – A firearm with a barrel diameter of one-half inch (12.7 millimeters) or more; examples include the .50 caliber heavy machine gun, the 40mm mortar, and the 155mm howitzer

*Live-fire* – Training conducted with explosives, incendiary ordnance, or ammunition that fires a bullet or other projectile as opposed to blank ammunition where nothing leaves the gun barrel

*Machine Gun* – A type of automatic portable or vehicle-mounted military weapon designed to fire ammunition in quick succession; light machine guns are small caliber weapons that are designed for the individual soldier, heavy machine guns are large caliber weapons and must be vehicle-mounted or crew-served

*Maneuver* – Tactical movement of assault forces to achieve an advantage over the enemy

*Missile* – Self-propelled, precision-guided projectile; fired from a vehicle-mounted or shoulder-fired missile launcher

*Mine (Landmine)* – An explosive device planted in the ground; designed to destroy or damage vehicles or personnel when the target approaches or triggers the device

*Mortar* – A muzzle-loading indirect fire weapon with a high angle of fire

*Munitions* – Military weapons and ammunition; ordnance

*Non-dud-producing* – Ordnance that is inert and contains no explosive or incendiary material and cannot result in a dud

*Non-live-fire* – Tactical combat training using blank ammunition

**Appendix A – Descriptions of Routine Military Training and Related Activities**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

**Appendix A – Descriptions of Routine Military Training and Related Activities**

*Operational* – Relating to the mission, objectives, and tasks of the Army or other military operations

*Ordnance* – Military supplies, primarily weapons and ammunitions; munitions

*Patrol* – Monitoring an area by traveling around or through it, and engaging the enemy if present; a group of soldiers tasked with the same

*Physical Readiness Training (PRT or PT)* – A soldier's basic daily physical conditioning and training. May include the use of obstacles in a designated confidence course

*Platoon* – A military unit consisting of three to four squads, approximately 16 - 40 soldiers; see section 3.1

*Pyrotechnics* – Devices used to produce smoke or light, either for signaling or to simulate combat situations such as artillery fire

*Rocket* – Self-propelled unguided projectile; fired from a vehicle-mounted or shoulder-fired rocket launcher

*Seibert Stakes* – High-visibility markers used by the U.S. Army to identify areas that are off-limits for training activity

*Shoulder-Fired* – A type of weapon system for aiming and launching rocket or missile while it is held on one's shoulder

*Simunition* – A type of training ammunition that fits in standard small-arms weapons but fires paint balls instead of bullets

*Small Caliber* – A firearm with a barrel diameter of up to one-half inch (.50 caliber) or 12.7 millimeters; examples include the 5.56mm carbine and .30 caliber rifle

*Small Arms* – Small caliber, portable firearms designed for individual use; examples include handguns, shotguns, light machine guns, rifles, and carbines

*Special Operations* – Unconventional missions conducted by specialized units, often involving combined forces from multiple branches of the U.S. military

*Squad* – The basic military unit consisting of 4-10 soldiers; see section 3.1

*Tactical* – Relating to planned military actions or combat tactics

*Targeted Impact Area* – Area currently used for routine military live-fire training with inert ordnance; UXO from previous training may be present

*Targeted High Hazard Impact Area* – Area currently used for routine military live-fire training with high-explosive or incendiary ordnance; UXO is present

**Appendix A – Descriptions of Routine Military Training and Related Activities**

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**Appendix A – Descriptions of Routine Military Training and Related Activities**

*Tilt-rotor aircraft* – A hybrid aircraft that can takeoff and land like a helicopter, then tilt its engines to fly like an airplane; the Marine Corps V-22 Osprey is the primary example

*Touch-and-Go* – A type of aviation training that involves quick landings and takeoffs without activity or extended time on the ground

*Training Ammunition* – Projectile ammunition used during training actions; includes paint-marking ammunition, short-range training ammunition (STRA) with rubber or plastic bullets, and non-dud-producing large-caliber ordnance

*Training Area* – Large geographic area used by the U.S. Army to conduct military training actions; subdivided into training ranges

*Training Range* – Small geographic subdivision of a training area often designated for specific weapons qualifications or other training actions

*Unit* – A military element or group such as a squad, platoon, company, etc.; see section 3.1

*Unmanned Aerial Vehicle* – An aircraft flown without a pilot aboard; commonly known as a drone

*Weapons System* – Individual or crew-served large caliber munitions, using standard, incendiary, or high-explosive ammunition, either portable or vehicle-mounted. Examples include heavy machine guns, rocket launchers, shoulder-fired missiles, hand grenades, grenade launchers, mortars, and howitzers

**Appendix A – Descriptions of Routine Military Training and Related Activities**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

## **Appendix B – Maps and List of Areas Surveyed for Historic Properties**

Programmatic Agreement Among U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, the Hawaii State Historic Preservation Officer, and the Advisory Council On Historic Preservation Regarding Routine Military Training Actions And Related Activities At United States Army Installations On The Island Of Hawai'i, Hawai'i

Appendix B contains maps and lists of surveys conducted to identify historic properties and assessed as adequate per 36 CFR § 800.4(b). Within the scope of this agreement, the surveys listed herein will be used for training area activity reviews as specified in Stipulation II of this agreement.

This appendix shall be updated as new surveys are finalized pursuant to Stipulation V.B. of this agreement.

The following acronyms are used to identify organizations who have produced reports included in this appendix:

CSH: Cultural Surveys Hawaii, Inc.

DPW-CRS: USAG-HI DPW Cultural Resources Section

GANDA: Garcia and Associates

IARII: International Archaeological Research Institute, Inc.

OEES: Ogden Environmental and Energy Services Co., Inc.

PACLEG: Pacific Legacy, Inc.

PCSI: Pacific Consulting Services, Inc.

PHRI: Paul H. Rosendahl, Ph.D., Inc.

PTA-CRS: USAG-Pohakuloa – Cultural Resources Section.

This includes staff that support the USAG-Pōhakuloa Cultural Resources Section through a cooperative agreement with the Pacific International Center for High Technology Research/Research Corporation of the University of Hawaii

SCS: Scientific Consultant Services, Inc.

SCS/CRMS: Scientific Consultant Services, Inc./Cultural Resource Management Service

UAA: University of Alaska Anchorage

USACE: United States Army Corps of Engineers

USMC: United States Marine Corps

UHM: University of Hawaii, Manoa

Note: Some of the archaeological reports combine pedestrian and aerial survey. Only the pedestrian surveys are considered to have adequately assessed the area for potential historic properties. All of the reports listed below include at least some pedestrian survey, and most only report on pedestrian survey.

## **Appendix B – Maps and Lists of Areas Surveyed for Historic Properties**

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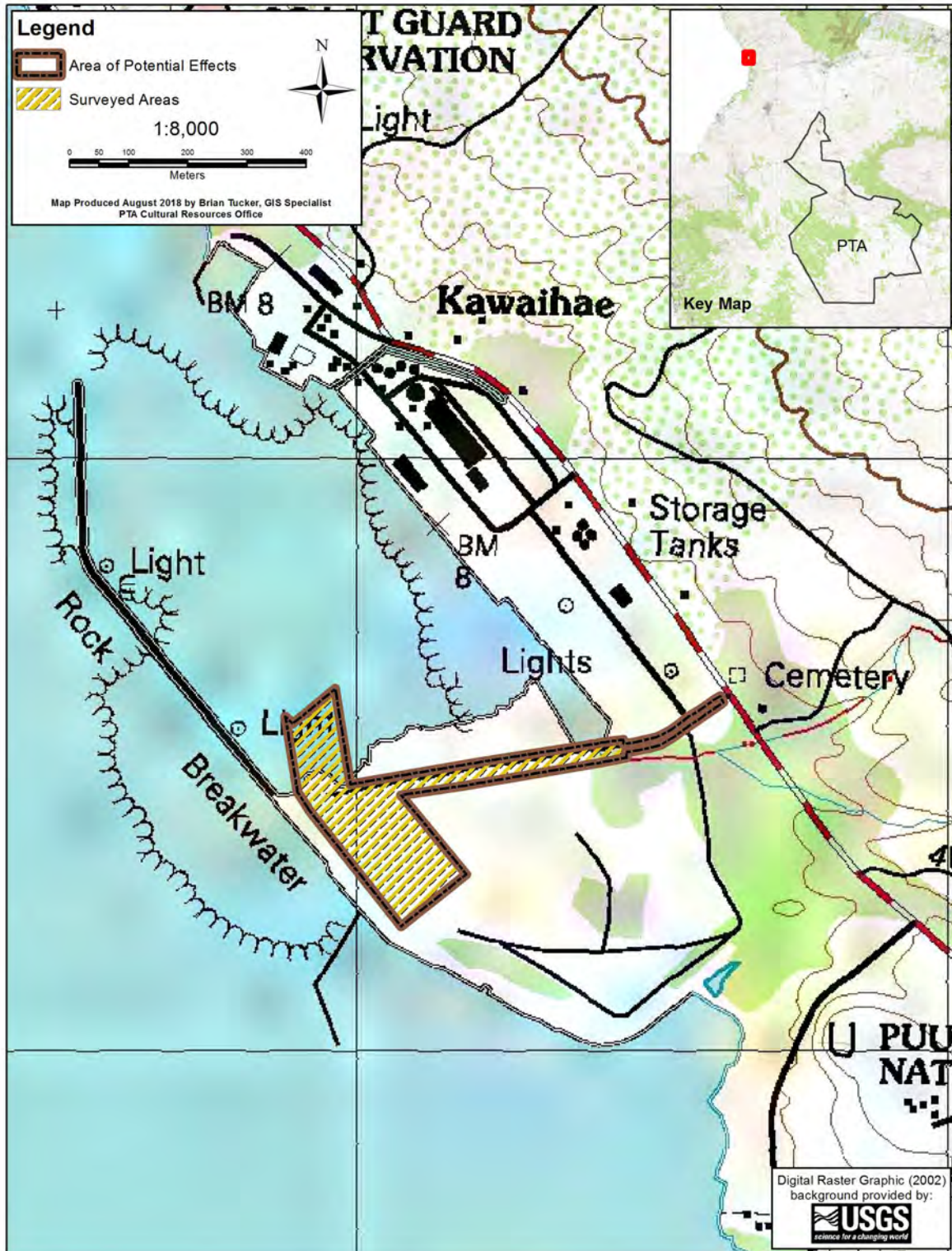


Figure B-1. Historic Property Survey at Kawaihae Military Reservation

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## Surveys at Kawaihae Military Reservation

Author(s)	Title	Organization
Zulick and Cox 2000	Survey Project #8 – Kawaihae Military Reservation (KMR) pp. 68-70 in Cultural Resources Management Army Sub-installations U.S. Army Garrison Hawaii Annual Report, Volume 1 of 2 Prepared by: The Research Corporation of the University of Hawaii, Loren Zulick & David Cox, for the U.S. Army Garrison, Hawaii	DPW-CRS

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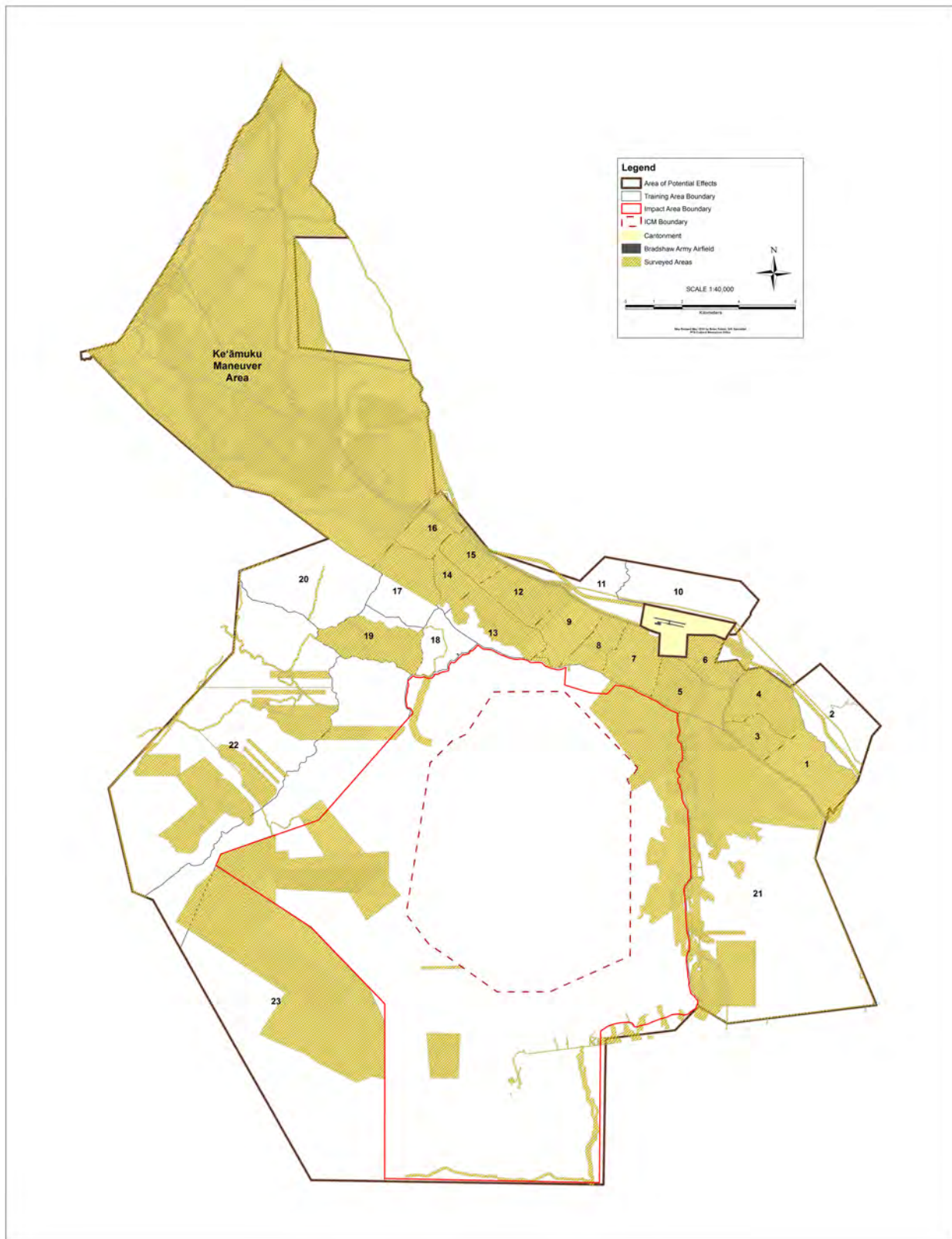


Figure B-2. Archaeological Surveys to identify historic properties at PTA

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### Surveys at Training Area 1

Author(s)	Title	Organization
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Roberts, Roberts & Desilets 2004	Archaeological Reconnaissance of Training Areas 1, 3, and 4 U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 2

Author(s)	Title	Organization
Stine 2010	Memorandum For Record: Firebreak Survey in Training Area 2, Pōhakuloa Training Area (PTA), Ka'ōhe Mauka Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 92-95 in Head et al. 2011 Cultural Resources Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS

### Surveys at Training Area 3

Author(s)	Title	Organization
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Roberts, Roberts & Desilets 2004	Archaeological Reconnaissance of Training Areas 1, 3, and 4 U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 3

Author(s)	Title	Organization
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and	PHRI

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	Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	
Roberts, Roberts & Desilets 2004	Archaeological Reconnaissance of Training Areas 1, 3, and 4 U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 4

Author(s)	Title	Organization
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Roberts, Roberts & Desilets 2004	Archaeological Reconnaissance of Training Areas 1, 3, and 4 U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 5

Author(s)	Title	Organization
Bayman et al. 2001	The University of Hawai'i Archaeology Field School Pōhakuloa, Island of Hawai'i	UHM
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Moniz Nakamura 1999	Annual Report. Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Roberts et al. 2004a	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Roberts et al. 2004b	Archaeological Survey of Training Areas 5 and 21 and Eligibility Evaluations of Volcanic Glass Quarry Sites in the Vicinity of Redleg Trail (Range 10), U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA

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Shapiro and Cleghorn 1998	Archaeological Investigations of Two Work Areas for the Legacy Resource Management Program at Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PACLEG
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

## Surveys at Training Area 6

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'eke'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Buffum et al. 2003	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team (SBCT) U.S. Army Hawaii, Schofield Barracks Hawaii	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
King and Head 2004	Memorandum for Record: Archaeological Reconnaissance Survey of Approximately 600 Acres in Training Areas 6, 7, and 8, Pohakuloa Training Area	PTA-CRS
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Moniz Nakamura 1999	Annual Report. Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

## Surveys at Training Area 7

Author(s)	Title	Organization
Buffum et al. 2003	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade	GANDA

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	Combat Team (SBCT) U.S. Army Hawaii, Schofield Barracks Hawaii	
King and Head 2004	Memorandum for Record: Archaeological Reconnaissance Survey of Approximately 600 Acres in Training Areas 6, 7, and 8, Pohakuloa Training Area	PTA-CRS
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Roberts et al. 2004a	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Robins and Buffum 2006	Phase II Archaeological Research of Proposed BAX and AALFTR Training Areas for Stryker Brigade Combat Team (SBCT) U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Rumsey 2008	Memorandum For Record: Survey of area of potential effect for the proposed tactical vehicle wash located within Training Area 7. Pohakuloa Training Area TMK (3) 4-4-016:001, Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 85-87 in Taomia et al. 2010. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Tejeda 2013	Memorandum for Record: Archaeological Testing and Plan Mapping of Sites 24326, 24327, 23457, and 23462, Battle Area Complex (BAX), Training Area 7, Pohakuloa Training Area (PTA), in Ka'ohe Mauka Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i, in Tejeda et al. 2014. Cultural Resource Management Annual Report 2012-2013 Pohakuloa Training Area, Island of Hawai'i, U.S. Army Garrison Hawaii	PTA-CRS
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

## Surveys at Training Area 8

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural	GANDA

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	Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'ek'e'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
King and Head 2004	Memorandum for Record: Archaeological Reconnaissance Survey of Approximately 600 Acres in Training Areas 6, 7, and 8, Pohakuloa Training Area	PTA-CRS
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 9

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'ek'e'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

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## Surveys at Training Area 10

Author(s)	Title	Organization
	No surveys	

## Surveys at Training Area 11

Author(s)	Title	Organization
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Stine 2008	Memorandum for Record. Archaeological and historical survey for the proposed Ahi Road widening project at Pohakuloa Training Area, TMK (3) 4-4-016:005, Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island, Hawaii in Taomia <i>et al.</i> 2010. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

## Surveys at Training Area 12

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'ekē'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uānāhulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

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### Surveys at Training Area 13

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'eke'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA

### Surveys at Training Area 14

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'eke'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA

### Surveys at Training Area 15

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'eke'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the	PHRI

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	Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 16

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'ekē'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets and Roberts 2005	Final Report: Phase I Archaeological Reconnaissance Survey of 1,010 Acres of Pu'u Ke'ekē'e Lands at U.S. Army Pohakuloa training Area, Waikoloa Ahupua'a, South Kohala District, Island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Welch 1993	Archaeological Survey and Testing for the Saddle Road Improvement Project, Pohakuloa Area, Island of Hawai'i, Hawaii	IARII

### Surveys at Training Area 17

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'ekē'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets and Roberts 2005	Final Report: Phase I Archaeological Reconnaissance Survey of 1,010 Acres of Pu'u Ke'ekē'e Lands at U.S. Army Pohakuloa training Area, Waikoloa	GANDA

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	Ahupua'a, South Kohala District, Island of Hawai'i, Hawai'i	
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA
Taomia and Stine 2007	Memorandum for Record. Archaeological Survey for Northern Fence Unit in Ka'ohe Ahupua'a, Hāmākua District (TMK: (3) 4-4-016:001), Waikoloa Ahupua'a in South Kohala District (TMK: (3) 6-7-001:003), and Pu'u Anahulu Ahupua'a in North Kona District (TMK: (3) 7-1-004:007), Hawai'i Island, Hawai'i in Taomia et al. 2009. Annual Report July 1, 2007 thru June 30, 2008 Cultural Resources Management Projects Performed at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

### Surveys at Training Area 18

Author(s)	Title	Organization
Taomia 2009	Memorandum for Record. Memorandum for Record. Archaeological Inventory Survey (TMK: (3) 4-4-016:005) in Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island pp. 289 - 292 in Taomia et al. 2010. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

### Surveys at Training Area 19

Author(s)	Title	Organization
Brown et al. 2008	Final: Phase II Archaeological Survey for Significance Determination of Cultural Resources in Stryker Brigade Combat Team Go/No Go Maneuver Areas and a 1,010 Acre Area Near Pu'u Ke'ekē'e, Pohakuloa Training Area, island of Hawai'i, Hawai'i	GANDA
Desilets et al. 2005	Phase I Archaeological Reconnaissance Survey For SBCT Go/No Go Maneuver Areas at U.S. Army Pohakuloa Training Area, Ka'ohe Ahupua'a, Hāmākua District and Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i	GANDA

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Luscomb 2006	Memorandum for Record. Trip Report for Historic Properties Survey for Proposed Construction of Firebreak #7 located in Training Area 19. P. 18 in Taomia et al. 2008. Annual Report – July 1, 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia and Stine 2007	Memorandum for Record. Archaeological Survey for Northern Fence Unit in Ka'ohe Ahupua'a, Hāmākua District (TMKⓈ3) 4-4-016:001), Waikoloa Ahupua'a in South Kohala District (TMK: (3) 6-7-001:003), and Pu'u Anahulu Ahupua'a in North Kona District (TMK: (3) 7-1-004:007), Hawai'i Island, Hawai'i in Taomia et al. 2009. Annual Report July 1, 2007 thru June 30, 2008 Cultural Resources Management Projects Performed at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

### Surveys at Training Area 20

Author(s)	Title	Organization
Head 2006	Memo, Fire Break Road 5. P. 17 in in Taomia et al. 2008. Annual Report – July 1, 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia and Stine 2007	Memorandum for Record. Archaeological Survey for Northern Fence Unit in Ka'ohe Ahupua'a, Hāmākua District (TMKⓈ3) 4-4-016:001), Waikoloa Ahupua'a in South Kohala District (TMK: (3) 6-7-001:003), and Pu'u Anahulu Ahupua'a in North Kona District (TMK: (3) 7-1-004:007), Hawai'i Island, Hawai'i in Taomia et al. 2009. Annual Report July 1, 2007 thru June 30, 2008 Cultural Resources Management Projects Performed at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

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## Surveys at Training Area 21

Author(s)	Title	Organization
Crowell et al. 2010	Phase I Cultural Resources Survey of a Proposed Fence Unit Around Training Area 21 at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Curdts and Yamauchi 2012	Cultural Resources Survey of Training Area 21 for the Proposed Fence Line Realignment Route, Pohakuloa Training Area (PTA), Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 204-227 in Head et al 2014. Cultural Resource Management Annual Report 1 July 2011 – 30 June 2012 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Godby and Frazier 2002	Memorandum for Record. Trip Report for archaeological reconnaissance of road widening and improvement at Pohakuloa Training Area, Island of Hawaii in Godby and Frazier 2003. Annual Report – July 1, 2001 thru June 30, 2002 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2013	Memorandum For Record. Archaeological and Historical Survey of Areas for UXO detonations in Training Area 21 (TA 21), Pohakuloa Training Area (PTA), Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 745-750 in Tejeda et al. 2014. Cultural Resources Management Annual Report 2012-2013 Pohakuloa Training Area, Island of Hawai'i, U.S. Army Garrison, Hawaii	PTA-CRS
Monahan et al. 2013	Archaeological Phase II Crater Investigation, U.S. Army Pōhakuloa Training Area, Island of Hawai'i, Hawai'i: A Functional and Temporal Interpretation of Excavated Pits in the Mauna 'Āina and Their Significance in Hawaiian Prehistory	CSH
Moniz Nakamura 1999	Annual Report. Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

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Roberts et al. 2004	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team U.S.Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Roberts et al. 2004	Archaeological Survey of Training Areas 5 and 21 and Eligibility Evaluations of Volcanic Glass Quarry Sites in the Vicinity of Redleg Trail (Range 10), U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Robins and Buffum 2004	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Shapiro et al. 1998	Final Report: Redleg Trail Archaeological Investigations for the Legacy Resource Management Program at Pohakuloa Training Area, Hawai'i Island, Hawai'i	PACLEG/GANDA
Taomia 2006	Memorandum For Record. Trip Report for Historic Properties Survey for Proposed Construction of new Ammunition Holding Area (AHA) located in Training Area 21 p. 123 in Taomia et al. 2008. Annual Report – July 1, 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Williams 2002	Ecosystem Management Program Cultural Resources Inventory Survey of Previously Unsurveyed Areas, Redleg Trail Vicinity, U.S. Army Pohakuloa Training Area, Island of Hawai'i, Hawai'i	OEES
Williams editor 2002	Archaeological Reconnaissance Survey U.S. Army Pohakuloa Training Area (PTA) for the U.S. Army Garrison, Hawaii, Ecosystem Management Program, Hawai'i Island, Hawai'i	OEES

## Surveys at Training Area 22

Author(s)	Title	Organization
Coons et al. 2007	Cave Team One: Outline of Accomplishments pp. 70-72 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Coons et al. 2008	Annual Report for the 9 January – 30 April 2008 Season pp. 306-310 in Taomia et al.	PTA-CRS

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	2009. Annual Report 1 July 2007 – 30 June 2008 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	
Escott 2007	Phase I Archaeological Reconnaissance Survey of Trail SIHP Site # 19528 on Lands of the U.S. Army Pohakuloa Training Area in the Districts of Kona and Hamakua, Island of Hawaii, Hawaii	PTA-CRS
Godby 2003	Memorandum For Record: Site visit and finding of human remains at site 23694, Cave System C, entrance 3A, Training Area 22, adjacent to Old Kona Highway	PTA-CRS
Grover et al. 2016	Archaeological Survey of Training Area 22, Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	UAA
Hanson et al. 2015	Archaeological Survey of Training Area 22, Pōhakuloa Training Area, Island of Hawai'i, Hawai'i. Prepared for Cultural Resources Section Environmental Division, Directorate of Public Works, U.S. Army Garrison, Pōhakuloa Training Area	UAA
Haun 1986	Archaeological Survey and Testing at the Bobcat Trail Habitation Cave Site (50-10-30-5004) Pohakuloa Training Area, Island of Hawaii, Hawaii	PHRI
Head 2004	Memorandum For Record: Pohakuloa Training Area Cave Survey Project – T-13 Cave in "D" Cave System in TA 22	PTA-CRS
Head 2006	Memorandum For Record: Archaeological and Historical Survey of a Proposed Fence Line at Pōhakuloa Training Area, North Kona District, Hawai'i Island, Hawaii pp. 57-59 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2006	Memo: Fire Break Road 5 in in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2009	Memorandum For Record: 28 January 2009 Site location activities in "D" cave system in Training Area 22, Pohakuloa Training Area, TMK (3) 4-4-016:001, Ka'ohē Ahupua'a,	PTA-CRS

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	Hāmākua District, Hawai'i Island, Hawai'i pp. 161-168 in Taomia et al. 2011. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	
Head 2009	Memorandum For Record: 29 January 2009 Site location activities in "D" cave system in Training Area 22, Pohakuloa Training Area, TMK (3) 4-4-016:001 Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 169-177 in Taomia et al. 2011. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2009	Memorandum For Record: 30 January 2009 Site location activities in "D" cave system in Training Area 22, Pohakuloa Training Area, TMK (3) 4-4-016:001, Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 178-183 in Taomia et al. 2011. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2010	Memorandum For Record: Archaeological Survey of a Proposed Fence Route in Training Area 22, Pohakuloa Training Area (PTA) Ahupua'a of Pu'u Anahulu, North Kona District, Hawai'i Island, Hawai'i pp. 89-91 in Head et al. 2011. Cultural Resources Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Luscomb 2006	Memorandum For Record: Trip Report for Historic Property Survey for Proposed Construction of Firebreak #2 located in Training Area 22 pp. 19-20 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Luscomb 2007	Memorandum For Record: Trip Report for Historic Property Survey and corridor	PTA-CRS

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	marking for Proposed Construction of Firebreak 7 in Training Area 22 pp. 28 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	
Luscomb et al. 2008	Annual Report – July 1, 2004 thru June 30, 2005 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Nees and Williams 2001	Archaeological Survey and Limited Testing at Bobcat Kipuka, Pohakuloa Training Area (PTA) Hawaii, Hawai'i Island	OEES
Rumsey 2009	Memorandum For Record: Cave mapping at site 19514, in Training Area 22, Pohakuloa Training Area, TMK (3) 4-4-016:001, Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i pp. 141-142 in Taomia et al. 2011. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Shapiro and Cleghorn 1998	Archaeological Investigations of Two Work Areas for the Legacy Resource Management Program at Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PACLEG
Stine 2006	Memorandum For Record: Trip Report for Historic Properties Survey for Proposed Construction of Firebreak #4 located in Training Area 22, Pu'uanahulu Ahupua'a, North Kona District, Hawaii Island p. 23 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Stine 2006	Memorandum For Record: Firebreak Road Bypass Survey. P. 25 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2006 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Stine 2006	Memorandum For Record: Archaeological and Historical Survey of Proposed Cross	

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	Fence Line 1 at Pōhakuloa Training Area, Pu'u Anahulu Ahupua'a, North Kona District, Hawai'i Island, Hawaii pp. 53-56 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	
Stine 2007	Memorandum For Record: Trip Report for the field verification of the Firebreak Road Priority 2 Bypass Survey and possible alternative routes survey, Pōhakuloa Training Area, North Kona District, Hawai'i Island, Hawaii pp. 49-51 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Stine 2007	Memorandum For Record: Archaeological and Historical Survey for West Side Fence Line, Pōhakuloa Training Area, North Kona District, Hawai'i Island, Hawaii p. 66 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Syrop and Curdts 2012	Memorandum for the Record: Archaeological survey for a portion of the Charlie Circle Trail, Training Area 22, Pōhakuloa Training Area, [TMK (3) 4-4-016:001], Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island. Prepared for Directorate of Public Works, Environmental Office, Pōhakuloa Training Area U.S. Army Garrison-Hawai'i. Prepared by Research Corporation of the University of Hawai'i pp. 593-651 in Tejeda et al. 2014. Cultural Resources Management Annual Report 2012-2013 Pōhakuloa Training Area, Island of Hawai'i	PTA-CRS
Taomia 2006	Memorandum For Record: Trip Report for Historic Properties Survey for Proposed Construction of Firebreak #3 located in Training Area 22 pp. 21-22 in Taomia et al. 2008. Annual Report July 1 2006 thru June	PTA-CRS

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	30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	
Taomia 2007	Memorandum For Record: Trip Report for Historic Property Survey for Proposed Construction of Additional Firebreak Construction located in Training Area 22 pp. 26-27 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia 2007	Memorandum For Record: Trip Report for Historic Property Monitoring of Fire Break Priority 2 Construction located in Training Area 22 pp. 45-47 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia 2007	Memorandum For Record: Trip Report for Historic Property Survey for Proposed Re-alignment of Fire Break Priority 2 located in Training Area 22 pp. 51-53 in Taomia et al. 2008. Annual Report July 1 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia 2008	Memorandum For Record: Site visit to relocate pictograph site set amongst large cluster of features associated with site 19528, and to evaluate proposed gate location in fenceline (TMK: (3) 7-1-004:001) in Pu'u Anahulu Ahupua'a, North Kona District, Hawai'i Island pp. 108-120 in Taomia et al. 2011. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Wilkinson et al. 2014	Final Archaeological Survey Report for Training Area 22, U.S. Army Pōhakuloa Training Area, Island of Hawai'i, Hawai'i. Prepared for U.S. Army Corps of Engineers, Honolulu District	CSH

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## Surveys at Training Area 23

Author(s)	Title	Organization
Athens and Kaschko 1989	Prehistoric Upland Bird Hunters: Archaeological Inventory Survey and Testing for the MPRC Project Area and the Bobcat Trail Road, Pōhakuloa Training Area, Island of Hawai'i	IARII
Godby and Frazier 2002	Annual Report – July 1, 2001 thru June 30, 2002 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2006	Memorandum For Record: Archaeological Survey of Two Proposed Fence Re-Routes in Training Area 23, Pōhakuloa Training Area, Hāmākua District, Hawai'i Island, Hawaii pp. 60-63 in Taomia et al. 2008. Annual Report – July 1, 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Head 2007	Memorandum For Record: Trip Report for Historic Property Survey for Proposed Construction of Additional Fence located in Training Area 23 pp. 63-65 in Taomia et al. 2008. Annual Report – July 1, 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Luscomb et al. 2008	Annual Report – July 1, 2004 thru June 30, 2005 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Moniz-Nakamura 1998	Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Moniz-Nakamura 1999	Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Reinman and Schilz 1999	Aerial and Ground Archaeological Inventory Survey for Compilation of Environmental Impact Statement, Multi-Purpose Range	OEES

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Complex, Pōhakuloa Training Area, Island of Hawai'i

## Surveys at Ke'āmuku Maneuver Area

Author(s)	Title	Organization
Cox 1983	Preliminary Cultural Resources Reconnaissance Report for Tank Trail from Kawaihae to Pōhakuloa Training Area, Island of Hawai'i	USACE
Coward 2010	Fence Post Documentation and Survey in the Keamuku Maneuver Area (KMA) (Priority Area 2), Pohakuloa Training Area (PTA), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	
Crowell 2011	Memorandum for the Record: Phase I Cultural Resources Survey of Target Locations for the Proposed Repairs to Ke'e Road and the Main Supply Route in Priority Area One of the Ke'āmuku Maneuver Area (KMA) at Pōhakuloa Training Area (PTA) Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK (3) 6-7-001:003] pp. 178-187 in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Crowell 2011	Memorandum for the Record: Cultural Resources Survey of the Proposed Improvements to the Popo'o Makai and Kalawamauna North Trails in Priority Area Three of the Ke'āmuku Maneuver Area (KMA), Pōhakuloa Training Area (PTA), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK(3) 6-7-001:009] pp. 224-255 in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2011 – 30 June 2012 Cultural Resources Management Projects Performed Under the Ecosystems Management	PTA-CRS

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	Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	
Crowell and Kerr 2011	Memorandum For Record: Cultural Resources Survey of the Proposed Improvements to the Kalawamauna North Trail in Priority Area Three of the Keamuku Maneuver Area at Pohakuloa Training Area, Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK (3) 6-7-001:009] pp. 256-275 in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2011 – 30 June 2012 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Crowell and Kerr 2011	Memorandum For Record: Cultural Resources Survey of the Proposed Improvements to the Popo'o Makai Trail in Priority Area Three of the Keamuku Maneuver Area at Pohakuloa Training Area, Waikoloa Ahupua'a, South Kohala District, Hawai'i Island [TMK (3) 6-7-001:009] pp. 276-291 in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2011 – 30 June 2012 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Desilets et al. 2017	Cultural Landscape Report Making Marginal Lands Pay: 150 Years of Ranching at Ke'amuku Waikoloa Ahupua'a, South Kohala District, Hawai'i Island	GANDA
Escott 2008	Revised: Phase II Archaeological Investigations at State Sites 50-10-21-23499, 23515, 23516, 23517 and 23539 on Lands of the Ke'amuku Sheep and Cattle Station, Located in the Ahupua'a of Waikoloa, South Kohala District, Island of Hawaii (TMK: 3-6-7-001:09). Prepared for Directorate of Public Works, Environmental Division, Schofield Barracks	SCS
Escott and Keris 2009	An Archaeological Inventory Survey Report for 600 Acres Located on Lands of Ke'amuku, Waikoloa Ahupua'a, South Kohala District, Hawai'i Island [TMK (3) 6-7-001:09]	SCS

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Head 2011	Memorandum For Record: Cultural Resources Survey of the Waiki'i Wild Fire Management Area in Priority Area 1 & 3 for the Proposed Improvements in the Keamuku Maneuver Area (KMA) at Pohakuloa Training Area (PTA), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK (3) 6-7-001:009] pp. 296-312 in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2011 – 30 June 2012 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Head 2011	Memorandum for the Record: Initial Prescribed Burn Survey in Ke'āmuku Maneuver Area (KMA) (Priority Area 2). (TMK: [3] 6-7-001:003), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island pp. 174-177 in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Kerr 2010	Memorandum For Record: Fence Post Documentation and Survey in Keamuku Maneuver Area (KMA) (Priority Area 2), Pohakuloa Training Area (PTA), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK: (3) 6-7-001:003] in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	PTA-CRS
Kerr 2011	Memorandum For Record: Cultural Resources Survey of the Proposed Improvements to the Kalawamauna North Trail in Priority Area Three of the Keamuku Maneuver Area at Pohakuloa Training Area, Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK (3) 6-7-001:009] pp. 292-295 in Head et al. 2014. Cultural Resource Management Annual	PTA-CRS

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	Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, State of Hawai'i	
Johnson et al. 2010	Additional Phase II Evaluation at State Site 50-10-21-23539 on Lands of the Former Ke'āmuku Sheep and Cattle Station of Parker Ranch, Waikoloa Ahupua'a, South Kohala District, Island of Hawai'i, Hawai'i	SCS
Langlas et al. 1998	The Saddle Road Corridor: An Archaeological Inventory Survey and Traditional Cultural Property Study for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR 200) Project	PHRI
Lewis et al. 2017	Supplemental Archaeological Testing of Sites in the Ke'āmuku Maneuver Area, U.S. Army Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Rechtman 2001	Archaeological Assessment Study for the New West Hawai'i Concrete Black Sand Quarry, Waikoloa Ahupua'a, South Kohala district, Island of Hawai'i	Rechtman Consulting
Roberts et al. 2004	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team, U.S. Army Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	GANDA
Robins et al. 2003	Archaeological Reconnaissance Survey and Monitoring in Support of the Defense Environmental Restoration Program of Formerly Used Defense Sites (DERP FUDS) Activities at the Former Waikoloa Maneuver Area, Ahupua'a of Kawaihai 2, 'Ouli, Lalamilo Waikoloa and Pu'ukapu, South Kohala District, Hawai'i Island, Hawai'i	OEES
Robins et al. 2007	Final: Intensive Phase II Survey for Significance Determinations of Cultural Resources, Ke'āmuku Land Acquisition Area (WPAA) for the Stryker Brigade Combat Team (SBCT), U.S. Army Pōhakuloa Training Area, Hawai'i Island, Hawai'i	GANDA
Robins and Desilets 2011	Archaeological Testing of Archaeological Sites and Possible U.S. Military Structures in the Ke'āmuku Maneuver Area of U.S. Army Pōhakuloa Training Area, Hawai'i Island, Hawai'i	GANDA

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Robins and Desilets 2015	Supplemental Archaeological Testing at Sites 50-10-21-22929, -22933, -23506, -23508, and -23512 in Ke'āmuku Maneuver Area, U.S. Army Garrison-Pōhakuloa, Waikoloa Ahupua'a, Hawai'i Island, Hawai'i	GANDA
Robins and Liston 2013	Final: Archaeological Investigation in Support of Construction and Operation of an Infantry Platoon Battle Area at Pōhakuloa Training Area, Hawai'i Island, Hawai'i	GANDA
Stine 2009	Memorandum For Record: Archaeological and historical inventory survey of proposed Ke'āmuku Loop Trail and two Forward Operating Bases (FOBs) (TMK: (3) 6-7-001:003) in Waikoloa Ahupua'a, South Kohala district, Hawai'i island pp. 293-305 in Taomia et al. 2011. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Stine 2010	Memorandum For Record: Fence Post Documentation and Survey in Keamuku Maneuver Area (KMA) (Priority Area 2), Pōhakuloa Training Area (PTA), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK: (3) 6-7 -001:003] in Head et al. 2014. Cultural Resource Management Annual Report 1 July 2010 – 30 June 2011 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, State of Hawai'i	
Syrop and Curdts 2013	Memorandum for the Record: Archaeological Survey of the He'ewai Mauka portion of the Main Supply Route (MSR) in Ke'āmuku Maneuver Area (KMA) for Trail Improvements, Pōhakuloa Training Area (PTA), Waikoloa Ahupua'a, South Kohala District, Hawai'i Island, Hawai'i [TMK: (93) 6-7-001: 045] in Tejeda et al. 2014. Cultural Resources Management Annual Report 2012-2013 Pōhakuloa Training Area, Island of Hawai'i	PTA-CRS
Syrop and Yamauchi 2012	Memorandum for the Record: Cultural Resources Photographic Documentation of the Historic Waimea-Kona Road, Ke'āmuku Maneuver Area (KMA), Pōhakuloa Training Area (PTA) in the Ahupua'a of Waikoloa,	PTA-CRS

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	South Kohala District, Island of Hawai'i [TMK (3) 6-7-100:003]. Prepared for Directorate of Public Works, Environmental Office, Pōhakuloa Training Area U.S. Army Garrison-Hawai'i. Prepared by Research Corporation of the University of Hawai'i pp 104-168 in Tejeda et al. 2014. Cultural Resources Management Annual Report 2012-2013 Pōhakuloa Training Area, Island of Hawai'i	
Taomia and Luscomb 2008	Memorandum for the Record: Ke'āmuku Trail 106 Survey (TMK: (3) 6-7-001:003) in Waikoloa Ahupua'a, South Kohala District, Hawai'i Island pp. 298-308 in Taomia et al. 2009 Annual Report – July 1, 2007 thru June 30, 2008 Cultural Resources Management Projects Performed at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia and Stine 2007	Memorandum For Record: Archaeological Survey for Northern Fence Unit in Ka'ōhe Ahupua'a, Hāmākua District (TMK: (3) 4-4-016:001), Waikoloa Ahupua'a in South Kohala District (TMK: (3) 6-7-001: 003), and Pu'u Anahulu in North Kona District (TMK: (3) 7-1-004: 007), Hawai'i Island, Hawai'i pp. 236-244 in Taomia et al. 2009 Annual Report – July 1, 2007 thru June 30, 2008 Cultural Resources Management Projects Performed at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Tejeda et al. 2014	Cultural Resources Management Annual Report 1 July 2009 – 30 June 2010 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i Volume 2: Compliance Fieldwork at Keamuku Maneuver Area	PTA-CRS
Wilkinson and Monahan 2014	Report for an Archaeological Survey of a Trail Corridor in the Ke'āmuku Land Parcel, U.S. Army Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	CSH
Wolforth and Rumsey 2010	Ke'āmuku Site Evaluations. Appendix II of Taomia et al 2010. Annual Report 1 July 2008 – 30 June 2009 Cultural Resources Management Projects Performed at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS

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## Surveys at Impact Area

Author(s)	Title	Organization
Doig and Head 2016	Memorandum for the Record: Archaeological and Historical Survey of Proposed Trap Range and Rifle/Pistol Range near Range 13A, Pōhakuloa Training Area (PTA), Ahupua'a of Ka'ohe Mauka, District of Hāmākua, Island of Hawai'i, Hawai'i [TMK 3-4-4-016:005 and TMK 3-4-4- 016:001]	PTA-CRS
Head et al. 2014	Final - Phase II Archaeological Investigation in Support of the Infantry Platoon Battle Area (IPBA) at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i [TMK: (3) 4-4-016:001]. Prepared for Directorate of Public Works, Environmental Office, Pōhakuloa Training Area U.S. Army Garrison-Hawai'i. Prepared by Research Corporation of the University of Hawai'i	PTA-CRS
Rasmussen 2013	Memorandum for the Record: Archaeological Survey of the Proposed Urban Close Air Support and Aviation Bulls- Eye Range, Pōhakuloa Training Area, [TMK (3) 4-4-016:001], Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island	USMC
Roberts et al. 2004a	Archaeological Surveys of Proposed Training Areas for the Stryker Brigade Combat Team U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Robins and Buffum 2006	Phase II Archaeological Research of Proposed BAX and AALFTR Training Areas for Stryker Brigade Combat Team (SBCT) U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii	GANDA
Robins and Liston 2014	Final: Pre-Construction Cultural Resources Survey of the Infantry Platoon Battle Course, U.S. Army Pōhakuloa Training Area, Hawai'i Island, Hawai'i (TMK: 3-4-4-016:001). Prepared for U.S. Army Engineer Honolulu District, Fort Shafter, Hawai'i	GANDA
Robins and Liston 2013	Final: Archaeological Investigation in Support of Construction and Operation of an Infantry Platoon Battle Area at Pōhakuloa Training Area, Hawai'i Island, Hawai'i (TMK: 3-4-4-016:001). Prepared for Department of the Army, U.S. Army Environmental Command, Fort Sam Houston, Texas	GANDA
Shapiro et al. 1998	Final Report: Redleg Trail Archaeological Investigations for the Legacy Resource	PACLEG/GANDA

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	Management Program at Pohakuloa Training Area, Hawai'i Island, Hawai'i	
Stine 2007	Memorandum for the Record: Archaeological Survey within the footprint of the proposed Mock Runway Pōhakuloa Training Area, North Kona District, Ka'ōhe Ahupua'a, Hawai'i Island, Hawai'i pp. 124-125 in Taomia et al. 2008. Annual Report – July 1, 2006 thru June 30, 2007 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Stine 2010	Memorandum for the Record: A-GI Village live-fire training Section 106 Survey, Range 11-T, Pōhakuloa Training Area, Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island, Hawai'i [TMK: (3) 4-4-016:001] pp. 305-310 in Yamauchi et al. 2014. Cultural Resources Management Annual Report 1 July 2009 – 30 June 2010 Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pohakuloa Training Area, Island of Hawai'i, Hawai'i. Volume 1	PTA-CRS
Syrop and Curdts 2013	Memorandum For Record: Archaeological Survey of the Southern Pōhakuloa Training Area (PTA) Landing Zone Extension of Landing Zone #04, PTA, Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island	PTA-CRS
Taomia 2008	Memorandum for Record: Pedestrian Survey for Convoy Live Fire Range Construction (TMK: (3) 4-4-016:001) in Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island pp. 278-290 in Taomia et al. 2009. Annual Report – July 1, 2007 thru June 30, 2008 Cultural Resources Management Projects Performed at Pōhakuloa Training Area, Island of Hawai'i, Hawai'i	PTA-CRS
Taomia 2014	Evaluation of Lava Tubes for the National Register of Historic Places Eligibility in the Infantry Platoon Battle Area, Pōhakuloa Training Area, Ka'ōhe Mauka Ahupua'a, Hāmākua District, Island of Hawai'i, Hawai'i, TMK: [3] 4-4-016. Pōhakuloa Training Area, Ka'ōhe Mauka Ahupua'a, Hāmākua District, Island of Hawai'i, Hawai'i, TMK: [3] 4-4-016	PTA-CRS
Tejeda et al. 2012	Memorandum for the Record: Archaeological Survey of the Proposed	

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	Infantry Platoon Battle Course Charlie Circle Alternative, Pōhakuloa Training Area, [TMK (3) 4-4-016:001], Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island. Prepared for Directorate of Public Works, Environmental Office, Pōhakuloa Training Area U.S. Army Garrison-Hawai'i. Prepared by Research Corporation of the University of Hawai'i pp. 601-647 in Cultural Resource Management Annual Report 2012-2013 Pōhakuloa Training Area, Island of Hawai'i, U.S. Army Garrison Hawaii	
Thurman et al. 2013	Archaeological Reconnaissance Survey Report of Infantry Platoon Battle Area, U.S. Army Pōhakuloa Training Area, Ka'ōhe Mauka Ahupua'a, Hāmākua District, Island of Hawai'i, Hawai'i, TMK: [3] 4-4-016. Prepared for U.S. Army Corps of Engineers, Honolulu District, Programs and Project Management Division, Environmental Branch, Fort Shafter, Hawai'i	CSH
Yamauchi 2013	Memorandum For Record: Archaeological Survey of Proposed Landing Zones, Pōhakuloa Training Area (PTA), Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island	PTA-CRS
Yamauchi et al. 2012	Memorandum for the Record: Archaeological Survey of the Proposed Range 20 Alternative, Pōhakuloa Training Area (PTA), [TMK (3) 4-4-016:001], Ka'ōhe Ahupua'a, Hāmākua District, Hawai'i Island. Prepared for Directorate of Public Works, Environmental Office, Pōhakuloa Training Area U.S. Army Garrison-Hawai'i. Prepared by Research Corporation of the University of Hawai'i	PTA-CRS

**Appendix B – Maps and Lists of Areas Surveyed for Historic Properties**

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FINAL//UNCLASSIFIED

**Appendix C – Historic Properties**

Appendix C contains a list of historic properties and potential historic properties previously identified within the area of potential effects for this programmatic agreement.

The term “historic properties” includes those prehistoric or historic districts, sites, buildings, structures or objects included in, or eligible for inclusion in the National Register of Historic Places (NRHP), including properties of religious and cultural significance to Native Hawaiian organizations that meet the National Register Criteria.

This appendix includes properties that have been formally evaluated for National Register eligibility, and properties (including properties of religious and cultural significance to Native Hawaiian organizations) that have not been evaluated. Those properties that have not yet been evaluated are treated as eligible and effects to them are avoided until formal evaluations can be made.

Locational information regarding archaeological sites and other historic properties is sensitive information and protected under Section 304 of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection Act, and is excluded from public disclosure under the Freedom of Information Act.

Categories used in the table:

Site Number – number assigned to the property for reference. Some are State Inventory of Historic Places (SIHP) numbers. Some are temporary numbers assigned using the USAG-Pohakuloa Cultural Resources Section standard incorporating the month, day and year in which the site was identified, T-MMDDYY-##. And a few have temporary site numbers assigned by contractors using a separate site numbering system. All site numbers are unique, no two sites or other properties have the same number.

Location – The general training area or other area in which the property is located. This corresponds with the areas as described in Appendices A and B.

Description – Brief description of what the property is.

NRHP Status – Status of the property regarding National Register eligibility. Options include:

Listed – Listed on the NRHP

Eligible – The property has been determined eligible for the NRHP

Unevaluated – The property has not been evaluated but is treated as if it is eligible until a formal determination is made. These sites are avoided.

Age – Time period with which the site is associated:

Traditional – Pre-Contact and/or early Post-Contact Native Hawaiian site

Historic – Historic era sites

Unknown –Further work is required to determine time period

This appendix shall be updated pursuant to Stipulation V.B. of this agreement as new properties are identified.

**Appendix C - Historic Properties**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii,  
The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine  
Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

**Appendix D – Established Areas**

Programmatic Agreement Among U.S. Army Garrison, Pōhakuloa Training Area, the Hawaii State Historic Preservation Officer, and the Advisory Council On Historic Preservation Regarding Routine Military Training Actions And Related Activities At United States Army Installations On The Island Of Hawai'i, Hawai'i

Appendix D contains maps of established areas, such as roads, landing zones, and firing ranges, within the area of potential effects for this programmatic agreement.

This Appendix is FOR OFFICIAL USE ONLY.

The information herein is excluded from public disclosure under the Freedom of Information Act.

This Appendix shall only be made available to signatory parties to this programmatic agreement for official use related to this agreement.

The Appendix must be protected from unauthorized disclosure, shall not be made available to the public, and may not be distributed without written authorization from the Commander of the U.S. Army Garrison, Pōhakuloa.

## **Appendix E – Cross Country Mobility Map**

Programmatic Agreement Among U.S. Army Garrison, Pōhakuloa Training Area, the Hawaii State Historic Preservation Officer, and the Advisory Council On Historic Preservation Regarding Routine Military Training Actions And Related Activities At United States Army Installations On The Island Of Hawai'i, Hawai'i

Appendix E contains maps to be used in reviewing proposed activities covered under this programmatic agreement under Stipulation II. The map will be provided to Range Division Hawaii in an appropriate digital format for their use in reviewing proposed activities.

Classification of the areas is as follows:

**Go** areas have been intensively surveyed and the potential effects of training and support activities taken into account in consultation with SHPD and consulting parties.

**Slow Go** areas are those where effects of training and support activities on historic properties have not been taken into account in consultation with SHPD and consulting parties. Some of these areas may require historic properties surveys, additional field work to determine National Register eligibility, and/or consultation with SHPD and consulting parties before training and support activities can take place.

**No Go** areas contain properties identified through survey that have not been evaluated for National Register eligibility and are therefore avoided in accordance with AR 200-1, or properties that have been determined eligible for the National Register and USAG-Pōhakuloa has committed to preservation and avoidance in consultation with SHPD and consulting parties.

## Appendix F – Standard Identification, Documentation and Evaluation Methods

This appendix defines the standard methods for identification and evaluation of potential historic properties for the purposes of this programmatic agreement (PA) in accordance with 36 CFR § 800.4.

In this appendix, the term “potential historic properties” includes all prehistoric and historic districts, sites, buildings, structures or objects in a survey area that are at least 50 years old, including properties of religious and cultural significance to a Native Hawaiian Organization (NHO), regardless of eligibility to the National Register of Historic Places (NRHP).

Since this PA does not authorize archaeological data recovery excavations, this appendix does not include methods for those excavations. Any archaeological excavations would have to be developed and authorized in a separate agreement specific to the property in question.

All identification, evaluation, and treatment efforts shall be conducted under the supervision of personnel who meet applicable professional qualifications. Agency personnel who conduct identification, evaluation, or treatment of potential historic properties shall meet the qualification standards established by the Office of Personnel Management for their respective disciplines in accordance with Section 112 of the NHPA (54 U.S.C. 306131). Contractors who conduct identification, evaluation, or treatment of potential historic properties on behalf of USAG-Pōhakuloa Training Area (USAG-Pōhakuloa) shall meet Secretary of Interior's Professional Qualification Standards for their respective discipline (36 CFR Appendix A to Part 61), or shall work at the direction of someone who meets those standards.

USAG-Pōhakuloa is required to make a reasonable and good faith effort to identify historic properties. Identification efforts will follow the Secretary of the Interior's Standards and Guidelines for Identification. Appropriate identification efforts will at a minimum include background research and additional efforts will be guided by the results of the background research. Additional identification efforts will be guided by the results of the background research and will be appropriate to the nature and scope of the proposed project. Such efforts may include intensive pedestrian archaeological survey, subsurface evaluative testing, remote sensing techniques, architectural survey, and gathering oral histories or other information from NHOs.

The purpose of background research is to determine if historic properties (or potential historic properties) have been previously recorded in the vicinity and what types of potential historic properties might reasonably be expected in a proposed survey area, to identify previous land use patterns that might have affected preservation of historic properties, and assess physical, topographical, and environmental conditions that could be related to probability of

### **Appendix F – Cultural Resource Identification and Evaluation**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

## Appendix F – Standard Identification, Documentation and Evaluation Methods

finding historic properties, and to determine what additional identification efforts are most appropriate.

All information about historic properties, potential historic properties, or properties of religious and cultural significance to Native Hawaiian Organizations, whether shared by Consulting Parties identified in Appendix H or documented during identification efforts, shall be protected in accordance with Section 304 of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection Act, and is excluded from public disclosure under the Freedom of Information Act. Unauthorized disclosure of this information may risk harm to historic properties and archaeological resources or impede the use of traditional religious sites by practitioners. Information about those properties shall only be made available to Signatories and Consulting Parties identified in Appendix H to this programmatic agreement for official use related to this agreement. That information shall not be made available to the general public and may not be distributed to individuals or organizations other than Signatories and Consulting Parties identified in Appendix H without written authorization from the USAG-Pōhakuloa Garrison Commander.

If the results of background research indicate that the area is feasible to survey, and the area has not been altered or disturbed to the extent that potential historic properties are no longer present, USAG-Pōhakuloa will conduct an intensive pedestrian survey to identify and document potential historic properties in the area.

Intensive pedestrian survey is not feasible on land that is greater than 60% slope (i.e., ~30 degrees or greater), land that is under water, land that is occupied by buildings, roads, or other constructed development, and land encumbered by unexploded ordnance or otherwise considered hazardous. Such areas will not be subject to intensive pedestrian survey, but will be subject to other types of identification efforts as appropriate.

Survey may include solely identification survey, evaluation survey, or a combination of the two. The size and scope of the project often determines the nature of the survey, with larger areas often covered in consecutive stages of identification and evaluation survey, and smaller areas covered by survey projects that incorporate both identification and evaluation during a single field survey project. Identification surveys usually consist of pedestrian survey across the landscape to identify potential historic properties. Evaluation surveys are generally more targeted and involve returning to previously identified properties to complete the full documentation required for NRHP evaluation. Combination surveys document potential historic properties for NRHP evaluation at the same time that they are identified.

Pedestrian identification survey shall be conducted in transects that are a maximum of 10 meters apart. Where visibility is poor the transects will be closer together; the field director shall ensure that the transect spacing is adequate to visually identify any potential historic properties within the survey area.

### **Appendix F – Cultural Resource Identification and Evaluation**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

## Appendix F – Standard Identification, Documentation and Evaluation Methods

If a potential archaeological historic property is found during a pedestrian survey, archaeologists will document the property using written descriptions, photographs and measurements and will create a plan map illustrating the property boundary, the location of features and artifacts within the property and the general topography. As scale allows, the relationship of the property to any other sites, buildings, objects or reference points in the area will be depicted either on the site plan map or on a map of the general area.

Where subsurface archaeological deposits are suspected, the field director and the USAG-Pōhakuloa Cultural Resources Manager (USAG-Pōhakuloa CRM) shall determine if subsurface testing is necessary to evaluate a potential historic property for NRHP eligibility. In general at PTA there is some surface indication of past activity at locations with subsurface archaeological deposits. Factors such as the nature of the sediment and past land use have contributed to virtually no subsurface archaeological deposits without some surface indications. All artifacts and other materials encountered during subsurface testing will be collected.

A temporary site number shall be assigned to each potential historic property identified, and a temporary site tag shall be left at the site, at the site datum. The USAG-Pōhakuloa Cultural Resources Section standard for temporary site numbers uses the letter T, followed by the month, day and year, and then a unique numerical identifier beginning with number 1 for each site identified on that day. Therefore archaeological sites identified in pedestrian survey on June 23, 2017 would be recorded as T-062317-01, T-062317-02 and so forth. On rare occasions multiple surveys occur concurrently; in these cases some means of separating site numbers identified by the different survey crews on the same day must be developed and coordinated through the USAG-Pōhakuloa CRM. Temporary site numbers will be converted to SIHP numbers prior to project completion.

At a minimum during survey a temporary site form shall be completed, and a GPS point collected at the site datum. All geospatial data will have Global Positioning System (GPS) points taken with sub-meter accuracy. The GPS points will be differentially corrected, and contain attribute detail on its time and date of collection, as well as its Positional Dilution of Precision (PDOP). All GPS points collected need to have a PDOP less than or equal to 6. Temporary site forms will be provided by the USAG-Pōhakuloa Cultural Resources Section.

Evaluation documentation shall collect sufficient information for NRHP evaluation, with reference to National Register Bulletin 16a for details. This shall include a scaled plan map of the entire property, scaled plan maps of features as appropriate, photographic documentation of the entire site and features following the NRHP guidelines, and a verbal site description. Evaluation documentation shall determine function and time period for the site as required for NRHP assessment. Subsurface testing may be required at some properties to determine if archaeological deposits are present, and to obtain materials that can provide absolute or relative dates for the site. Materials appropriate for dating include charcoal from cultural contexts, kukui nut shells, gourd fragments, diagnostic artifacts or other appropriate materials.

### **Appendix F – Cultural Resource Identification and Evaluation**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

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Deconstruction of stone structures on the surface may also be required to determine function and to identify any materials contained within or beneath the structures.

All charcoal samples shall be identified to species prior to submittal for radiocarbon analysis. Samples that are identified as short-lived species shall be submitted for radiocarbon analysis. Charcoal may be used to provide temporal control for a variety of past events. Preference will be given to charcoal or other datable materials from secure archaeological deposits to date past human activity unless the goal is to date other past events.

As specified in Army Regulation 200-1 Chapter 6-4, the U.S. Army policy is to limit the amount of archaeological material remains permanently curated by reserving such treatment for diagnostic artifacts and other significant and environmentally sensitive material that will add important information to site interpretation. Accordingly, USAG-Pōhakuloa will not collect surface artifacts unless the field director determines a significant diagnostic or environmentally sensitive artifact is in danger of loss or damage, or if the field director determines that field documentation is insufficient to capture the associated information. The field director will ensure that any artifacts that are not collected are described, measured, and photographed in the field, and a GPS point collected. The provenience of all collected materials shall be documented, on site maps as well as in field notes, with reference to site datum or other appropriate features or reference points at the site.

As a rule of thumb, features more than 15 meters apart are given separate site numbers. There are cases where features more than 15 meters apart are included in the same site number because they are clearly part of the same cultural entity. Site 19528, a trail on the west side of PTA, is an example of this, where some of the cairns on pāhoehoe segments of the trail are more than 15 meters from the ‘a‘ā segments of the trail and/or each other, but clearly mark the travel route across the pāhoehoe and therefore are features of the trail. If a case can be made for including disparate features as part of the same archaeological site these features should be combined into a single site, with a clear explanation for doing so.

The field director shall keep a daily log of survey activities and personnel. Other crew members are encouraged to keep daily logs of survey activities.

All site forms and field notes shall be maintained at USAG-Pōhakuloa Cultural Resources Office and Curation Facility, as appropriate, and are the property of the U.S. Army. Site forms and field notes shall be submitted to the USAG-Pōhakuloa Curation Facility upon completion of the project report. The materials may be made available to qualified professionals in accordance with 36 CFR § 79.10, subject to the requirements of Section 304 of the NHPA, Section 9 of the Archaeological Resources Protection Act, or agreements made with a consulting party. USAG-Pōhakuloa will store all collected material and associated records at the USAG-Pōhakuloa Cultural Resources Office and Curation Facility in accordance with the requirements of 36 CFR Part 79.

### **Appendix F – Cultural Resource Identification and Evaluation**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai‘i, Hawai‘i

## Appendix F – Standard Identification, Documentation and Evaluation Methods

Identified properties will be treated as eligible for the NRHP until formal determinations of eligibility have been completed in consultation with the State Historic Preservation Division (SHPD) and Native Hawaiian Organizations who may attach religious and cultural significance to the properties.

If no historic properties are identified during the project, USAG-Pōhakuloa shall prepare a report of the identification efforts and shall send it to SHPD and Consulting Parties identified in Appendix H of the PA. The review of the report shall follow the process established in Stipulation II.B.1.b.iii.

If potential historic properties are identified during the project, USAG-Pōhakuloa shall prepare a report of the identification efforts including a description of the properties identified and shall submit the report to SHPD and Consulting Parties listed in Appendix H. The review of the report and evaluation of the properties for NRHP eligibility shall follow the process established in Stipulation II.B.1.b.iv.

### **Appendix F – Cultural Resource Identification and Evaluation**

Programmatic Agreement Among The U.S. Army Garrison, Pōhakuloa Training Area, U.S. Army Garrison, Hawaii, The Hawaii State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related Activities at United States Army Installations on the Island of Hawai'i, Hawai'i

## Appendix F – Standard Identification, Documentation and Evaluation Methods

### Site Documentation

- Written description of the site, including its setting and environment. Description should include all material remains present, including recent modern debris. Condition of the site and its integrity as described in the National Register bulletins shall be included. Length and width, total area (acres/ha) of the site, measurements including length, width, height or depth, as appropriate, for all features. Depth of subsurface deposits shall be estimated or measured, if excavation takes place. Soil descriptions based on USDA standards including Munsell color will be included in descriptions of excavations.
- Overall scaled plan map of the site, including all features and site boundaries. Preference for tape and compass scaled plan map or plane table maps. Include important landscape features in the plan map. Include scale, north arrow, and site datum. Standard mapping practice is for north to be at the top of the page.
- All geospatial data will have Global Positioning System (GPS) points taken with sub-meter accuracy. The GPS points will be differentially corrected, and contain attribute detail on its time and date of collection, as well as its Positional Dilution of Precision (PDOP). All GPS points collected need to have a PDOP less than or equal to 6.
- Feature plan maps, as appropriate. Particularly for larger sites. Mapping standards shall follow those outlined for overall site plan maps above.
- Quality photographs of the site that meet the National Register standards for digital photographs. Clear vegetation as needed so that someone who has never visited the site has a clear visual image of the site. Professional photographs do not include people, body parts, backpacks or other archaeological field gear. Include scale and north arrow at a minimum, photo board if possible and accessible. Record all photographs in a photo log including date, direction of photo, site number, feature number, photographer and project.
- Lava tube site documentation should include mapping of all areas considered part of the site, to include the sink, light zones, and dark zones. Establish site datum and lava tube stations for mapping following the PTA Cave Team protocol for mapping. USAG-Pōhakuloa Cultural Resources Section shall provide the PTA Cave Team protocol.
- Documentation of other types of potential historic properties shall conform to the requirements of the National Register bulletins, and shall include verbal description of the property, a map of the property, photographs of the property, assessment of condition and integrity, all following the National Register guidelines.

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## Appendix F – Standard Identification, Documentation and Evaluation Methods

### Potential Historic Property Evaluation

- Evaluation of cultural resources for National Register eligibility shall take into account the physical documentation of the resource collected during field work, and any additional information from the SHPO, NHOs, and other sources such as previous reports, histories and historical source material, oral interviews and informant testimony, oral traditions, historical maps and other information sources relevant to evaluation of the resource.
- USAG-Pōhakuloa Cultural Resources Section has developed forms based on the National Register nomination forms for formal evaluation of resources. These forms encourage compilation of all of the required information for National Register evaluation as well as formal assessment of the information against the National Register criteria. Evaluations should make use of these forms, even for sites determined not eligible.
- Formal determinations of eligibility are submitted to the State Historic Preservation Division for review and concurrence.
- These evaluation procedures apply to all types of potential historic properties.

### **Appendix F – Cultural Resource Identification and Evaluation**

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## **Appendix G - Post-Review Discoveries**

If any potential historic properties (including graves, human skeletal remains; petroglyphs or pictographs; artifacts such as tools, weapons, bottles, etc.; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, walls, terraces, or other constructed features; any physical remains of habitation or other human activities older than 50 years) are found during a training action or related activity, the Officer-In-Charge or other responsible individual shall cease activity in the area, mark the area to prevent further disturbance, and notify the U.S. Army Garrison, Pōhakuloa (USAG-Pōhakuloa) Cultural Resources Manager (CRM) at 808-436-4280. The training action or related activity shall not resume in the vicinity of the discovery until the USAG-Pōhakuloa Garrison Commander provides written authorization.

The USAG-Pōhakuloa CRM shall dispatch a team, including an archaeologist and other appropriately qualified personnel, to investigate the discovery. All identification, evaluation, and treatment efforts shall be conducted under the supervision of personnel who meet applicable professional qualifications. Agency personnel who conduct identification, evaluation, or treatment of potential historic properties shall meet the qualification standards established by the Office of Personnel Management for their respective disciplines in accordance with Section 112 of the NHPA (54 U.S.C. 306131). Contractors who conduct identification, evaluation, or treatment of potential historic properties on behalf of USAG-Pōhakuloa shall meet Secretary of Interior's Professional Qualification Standards for their respective discipline (36 CFR Appendix A to Part 61), or shall work at the direction someone who meets those standards.

The discovery team will examine the discovery and the surrounding area to determine if the discovery warrants formal documentation as a potential historic property.

If the discovery is not a potential historic property (i.e. a modern or natural occurrence), the USAG-Pōhakuloa CRM shall provide a Memorandum to the Garrison Commander recommending resumption of the undertaking.

If the discovery is a potential historic property, the team shall document the property using written descriptions, photographs and measurements as appropriate and will create a plan map illustrating the property boundary, the location of features and artifacts within the property, the general topography, and the relationship of the property to any other sites, buildings, objects or reference points in the area. The team will capture appropriate geographic information with a GPS, including the site boundary and the location of any artifacts, features, and relevant reference points on the landscape.

USAG-Pōhakuloa shall notify State Historic Preservation Officer (SHPO) and Consulting Parties identified in Appendix H about the potential historic property

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## **Appendix G - Post-Review Discoveries**

discovery by email or letter within five (5) business days and in that notification shall propose a consultation meeting with the SHPO and Consulting Parties within 30 days to discuss National Register eligibility and develop a management plan to specific to the nature of the discovery, if necessary. The USAG-Pōhakuloa Garrison Commander shall decide if the undertaking may resume in the vicinity of the discovery based on the consultation and any resulting management plan.

Any newly-discovered potential historic property will be treated as an eligible historic property until USAG-Pōhakuloa consults with the Hawaii SHPO and Consulting Parties listed in Appendix H on the National Register eligibility and the resolution of adverse effects as appropriate. USAG-Pōhakuloa shall create a report of the discovery and the subsequent consultation and shall provide it to SHPO and consulting parties identified in Appendix H for review. USAG-Pōhakuloa shall include the discovery for the Stipulation IV.G. annual report.

If osteological materials are identified as part of the discovery, the discovery team shall shade the materials from exposure to the elements, protect them from further disturbance, and mark the area for avoidance. Qualified personnel with appropriate osteological education or experience will determine if the materials are human skeletal remains. The USAG-Pōhakuloa CRM shall ensure that determinations about osteological materials are commensurate with the level of expertise on staff at a given time. If a determination cannot be made with certainty by available personnel, the USAG-Pōhakuloa CRM will seek a determination from a forensic anthropologist, professional osteologist, or other appropriate specialist.

If the osteological materials include human skeletal remains, the USAG-Pōhakuloa CRM will contact USAG-Pōhakuloa Department of Army (DA) Police (and Criminal Investigation Division (CID) if appropriate). If the USAG-Pōhakuloa DA Police, and CID if participating, determines the discovery is not a criminal matter, the USAG-Pōhakuloa CRM will assess the antiquity and/or cultural affiliation of the remains based on the context and any associated material. If the antiquity and/or cultural affiliation of the human skeletal remains cannot be positively determined without destructive analysis, Native Hawaiian affiliation will be presumed. USAG-Pōhakuloa will not conduct or authorize any destructive analysis unless and until all National Historic Preservation Act (NHPA) and Native American Graves Protection and Repatriation Act (NAGPRA) consultation requirements have been fulfilled and such analysis is a requirement resulting from those consultations.

If the discovery includes Native Hawaiian human remains, funerary objects, sacred objects, or objects of cultural patrimony, USAG-Pōhakuloa will coordinate with the Army

### **Appendix G – Post-Review Discoveries**

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## **Appendix G - Post-Review Discoveries**

National Military Cemeteries staff and will follow the procedures for inadvertent discoveries specified in the implementing regulations of NAGPRA at 43 CFR § 10.4.

Activities in the vicinity of discovered human skeletal remains shall not resume until written authorization is provided by the USAG-Pōhakuloa Garrison Commander.

If the osteological materials are determined to be faunal remains, the USAG-Pōhakuloa CRM shall determine whether they are related to a potential archaeological historic property and shall document the material accordingly. If the USAG-Pōhakuloa CRM determines that the faunal remains constitute natural or modern occurrence, and are not part of an archaeological historic property, the USAG-Pōhakuloa CRM will remove, document the removal and dispose of the materials to prevent rediscovery in the future.

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## **Appendix H – Consulting Parties**

The following list includes individuals and organizations that have participated in consultation on the development of the Programmatic Agreement. Only organization names are listed, not individual members.

Office of Hawaiian Affairs  
Royal Order of Kamehameha, Moku o  
Mamalahoa  
Royal Order of Kamehameha, Moku o Kohala  
Royal Order of Kamehameha, Moku o Kona  
Association of Hawaiian Civic Clubs  
Hawaii Island District Council of Hawaiian  
Civic Clubs  
Waimea Hawaiian Civic Club  
Hilo Hawaiian Civic Club  
Mauna Kea Anaina Hou  
Historic Hawaii Foundation  
Pu'u Kohola National Historical Site  
Hawaii Volcanoes National Park  
Ala Kahakai National Historic Trail  
Aha Wahine  
Aha Kukaniloko koa mana mea ola kanaka  
mauli  
Hui Malama o Makua  
Hui Malama I Na Kupuna o Hawaii Nei  
The I'mua Group  
Native Hawaiian Church  
Peace Justice and Reconciliation Center  
Hawai'i Peace and Justice  
La'i'ōpua 2020  
Sierra Club  
Malu 'Aina  
Aha Hui Malama Hoa Ministry  
Aukahi  
'Ohana Keliinoi  
'Ohana Kapu  
'Ohana Kaleikini  
'Ohana Kawainui  
'Ohana Huihui  
'Ohana Kapu-Saffery  
Flores-Case 'Ohana  
'Ohana Keaweamahi  
'Ohana Ho'opakele  
Maxine Kahaulelio  
Clarence Ku Ching  
Kaleo Kualii  
Leimaile Quitevis  
Ruth Aloua

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