

ORGANIZATIONS

Letter O1

Comments



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SEATTLE, WASHINGTON TALLAHASSEE, FLORIDA WASHINGTON, D.C.
ENVIRONMENTAL LAW CLINIC AT STANFORD UNIVERSITY

October 6, 2005

Via U.S. Mail and Electronic Mail

Mr. Gary Shirakata
US Army Corps of Engineers
Honolulu Engineer District, Building 230
Fort Shafter, HI 96858-5440
email: Makua-EIS@poh01.usace.army.mil

Re: Mākua Military Reservation Draft Environmental Impact Statement

Dear Mr. Shirakata,

This letter, together with its attachments, supplements the comments Earthjustice offered at the public hearings on the Army's Draft Environmental Impact Statement ("DEIS") regarding military training activities at Mākua Military Reservation ("Mākua").¹

Inadequate Time for Public Comment

As a threshold matter, Earthjustice objects to the limited time the Army has allowed for public review of the DEIS. At the beginning of the public comment period, Earthjustice submitted a Freedom of Information Act ("FOIA") request for information related to the Army's claim that only training at Mākua would satisfy the proposed action's purpose and need. The requested information was vital to Earthjustice's review of the DEIS's alternatives analysis, "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. Yet, despite repeated promises from the Army's FOIA officer and lawyer, in the more than two months since Earthjustice submitted its FOIA request, the Army has failed to provide a single responsive document, depriving Earthjustice and the community groups with which it works, including Mālama Mākua, of a full and fair opportunity to offer input on the adequacy of the Army's analysis.

The limited public comment period also precluded several technical experts who provided comments at scoping and/or who reviewed the technical study work plans, including Mary Masters and Eric Enos, from reviewing the DEIS. Other experts, such as Eric DeCarlo, were able to complete only a partial review of the DEIS, due to the unreasonable time constraints. Earthjustice alerted the Army to the need for more time to allow for comprehensive

¹ As promised, I have attached copies of the various documents cited during my oral testimony.

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The Army extended the public review period from 60 days to 75 days for the Draft EIS in 2005. In response to comments, an additional 60 days were provided to the community to review the Draft EIS and associated studies related to marine resources and archaeological surveys, from February 2 to April 3, 2007. The technical experts retained on behalf of Mālama Mākua were provided 76 days for review of the marine resources study, archaeological study, and Draft EIS.

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expert review, as contemplated by the 2001 Settlement in Mālama Mākuā v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK), but the Army refused to provide a reasonable extension of the public comment period.

Training at MMR Not Necessary To Accomplish Army's Mission

- O1-2 As I discussed at the public hearings, the past seven years – during four of which Mākuā was completely closed to live-fire training – belie the Army's claim that training at Mākuā is vital to accomplishing its mission. I have attached hereto Commander's Assessment Letters prepared in December 2000, which the Army included in the administrative record in Mālama Mākuā v. Rumsfeld. See Exhibit 1. Significantly, none of these letters claimed that the closure of Mākuā to live-fire training had prevented any unit from being adequately prepared to perform its mission. Indeed, only two of these letters even mentioned the closure of Mākuā or, more generally, limited range facilities on O'ahu as a concern. See Assessment Letter for 3rd Brigade at 2 (noting "off-island deployments" could substitute for Mākuā); Assessment Letter for Aviation Brigade at 1-2 (noting larger problem of shortages of trained pilots). Even in those cases, the inability to train at Mākuā did not affect the overall conclusion that the units were "mission capable and ready for combat." Assessment Letter for 3rd Brigade at 1; see also Assessment Letter for Aviation Brigade at 1. For the few units facing readiness issues, the reasons given were personnel shortfalls or problems with equipment, not the unavailability of Mākuā. See, e.g., Assessment Letter for 71st Chemical Company (noting "[s]ignificant shortages in the areas of maintenance personnel"); Assessment Letter for C Company, 25th Aviation Regiment (noting shortages of personnel and "long order-to-receive time on critical repair parts"); Assessment Letter for G Company, 58th Aviation Regiment ("The degraded status of personnel and equipment decrease the probability of mission success"); Assessment Letter for 68th Medical Company (AA) ("lack of available aviation maintenance parts continues to be an issue"); Assessment Letter for 25th ID(L) Support Command ("personnel shortages "will greatly impact the electronic device maintenance support to the Brigade Combat Teams"); Assessment Letter for Military Police Brigade (readiness "affected by the shortage of qualified leaders and available personnel").

- O1-2 Commander's Assessment Letters prepared in August 2001 confirm that training at Mākuā, while convenient, is not necessary to accomplish the Army's mission. See Exh. 2. By August 2001, Mākuā had been closed for nearly three years. Given the Army's practice of re-stationing soldiers about once every two years, by August 2001, not a single soldier stationed in Hawai'i had fired a shot at Mākuā. Despite this, nearly all units were determined to be fully ready to perform their missions. The few units reporting limitations on their readiness did so due to lack of personnel and/or problems with equipment, not the closure of Mākuā. See, e.g., Assessment Letter for Aviation Brigade at 3; Assessment Letter for C Company, 25th Aviation Regiment at 2; Assessment Letter for G Company, 58th Aviation Regiment at 3; Assessment Letter for Headquarters, 65th Engineer Battalion at 1; Assessment Letter for 25th Military Police Battalion at 2; Assessment Letter for Headquarters, 17th Corps Support Battalion at 2.

Responses

O1-2

Training requirements are constantly changing based on lessons learned in combat, training events, new equipment, and new commanders. Using historical data to assess future needs is faulty logic. Times of war, such as now, drastically change training requirements. While units have been assessed in the past as ready for combat without conducting live-fire training exercises at MMR, the Army was forced to undertake training work-arounds to include training at locations outside of the state of Hawaii. These work-arounds were both time consuming and costly. Additionally, the lack of home-based live-fire training capability has an impact on Soldier morale as more time is spent away from family, which is not quantifiable in Unit Status Reports.

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Failure to Consider Reasonable Alternatives

O1-3 As discussed at the public hearings, the DEIS fails to consider several reasonable alternatives for accomplishing the Army's goals, including serious analysis of the "no action" alternative. See Exhibits 1 & 2 (25th Infantry Division units ready to achieve mission without training at Mākuia); Exhibit 3 (alternate training opportunities exist). The Mākuia EIS also must consider alternatives that include significantly lower levels of training than are proposed in the current three action alternatives. See Exhibit 5 (historic training levels at Mākuia). It must analyze alternatives involving construction of replacement training facilities, an alternative former commander of the 25th Infantry Division, Major General Dubik, acknowledge was realistic. See Exhibit 6; see also Exhibit 4 (construction of replacement facility would take only 24 months).² Moreover, given the availability of high speed transportation to neighbor islands, the Mākuia EIS must evaluate alternatives that involve training at Pōhakuloa and at alternate sites not on O'ahu. See Exhibit 7.

Corrections and Additions to Hearing Transcripts

I have reviewed the transcripts of the testimony I offered at the August 23 and 27, 2005 public hearings on the DEIS and have the following corrections and additions:³

August 23, 2005 Meeting Transcript

page 63, ll. 11-13: "Then, that waiver request never made it past the U.S. Army, ~~of the~~ Pacific because the U.S. Army Pacific determined that it was insufficient..."

page 63, ll. 16-18: "So it's never actually been formally submitted to the Pentagon, as the Army committed ~~admitted~~ that it would in October of 2001."

² According to General Dubik, the Army's acquisition of the South Range Acquisition Area as part of Stryker conversion was to allow the Army to construct the necessary facilities to replace Mākuia. If that is not the case, and Stryker conversion has instead precluded construction of a replacement facility, the Army must explain why and must justify its failure to analyze in the Stryker EIS the indirect impacts of pursuing Stryker conversion on cultural and biological resources at Mākuia.

³ Please note that text to be added is underlined, while text to be deleted has a strike-out line through it. I have provided corrections only where necessary to ensure the Army can understand the substance of my testimony.

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O1-3

Analysis of the impacts from the No Action Alternative was conducted in a manner similar to the analyses of the other project alternatives. The level of training reflected in Alternative is the minimum amount of CALFEX training required for the companies of the 25th Infantry Division. Section 2.5 of the EIS has been revised to address construction of replacement training facilities.

Analysis of other alternatives on Oahu is included in Section 2.5. This includes all Army lands on Oahu including Schofield Barracks. It also considers acquisition of additional training lands on Oahu to construct a new and/or replacement training facility. The EIS also now includes evaluation of an alternative in which training proposed for MMR would be conducted at the Pohakuloa Training Area, island of Hawaii (See Chapter 2 for a description of this alternative). After analysis of all alternatives, use of MMR remains the preferred alternative.

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- page 65, ll. 12-14: “Please bear in mind that the Army wants to conduct up to 242 days of training per year, and up to 50 company-level live-fire wild-fire exercises...”
- page 66, line 8: “... including, in 1988, the Gurkha Girea Army.”
- page 66, ll. 17-18: “During that time, we trained for the first Gulf War and in a variety of other military actions.”
- page 67, ll. 19-22: “... hit Sea C-Ridge, which for those of you who know the valleys, it’s between Makua Valley and Kahanaha’iki Kahana-Hei Valley, ...”
- page 69, ll. 8-9: “... how readiness ready its troops were at the time.”
- page 69, line 25: “... 14th Infantry Regimen Regiment ...”
- page 72, ll. 9-11: “... if you look on Military at Tab 31 of the training binder from the administrative record in the litigation over the Mākua Supplemental Environmental Assessment, you will see a presentation that G-3 put on for USARPAC (U.S. Army, Pacific) User Pack on in 12 April 2001.
- page 72, ll. 14-16: “And at page 16, there’s a sheet that says, “Working Company CAFEX Halifax Opportunities, ...”
- page 104, line 17: “... meet its training needs and performanee perform its mission ...”
- page 106, line 1: “... or that there won’t be any future management regime.”
- page 106, line 25: “... this is Tab 35 in your training binder ...”
- page 107, ll. 2-5: “Now, apparently that is out of the question because of the conversion of the 2nd Brigade into a Stryker unit. If that’s the case, then the Stryker EIS should have analyzed the indirect effects of on Makua of pursuing Stryker training.”
- page 107, line 20: “... is so beyond the pañ pale ...”
- August 27, 2005 Meeting Transcript**
- page 19, ll. 4-5: “You would be excessing aeessing that property ...”

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- page 20, line 15: "... alternative two, including weapons systems like tracers ..."
- page 23, ll. 9-10: "... why the Stryker EIS ~~you~~ did not look at ..."
- page 26, ll. 7-8: "... something closer to than historic levels ..."
- page 26, ll. 13-14: "Because you didn't tell us ~~why we needed in~~ the Stryker EIS why going forward with Stryker conversion would mean that you had to train at Mākua."
- page 26, line 23: Add the following comment at the end of the sentence: "If you conclude that you need to conduct training that you cannot accommodate elsewhere while constructing new facilities, whether on existing military installations or on newly acquired land, you need to consider alternatives that would involve only short-term use of Mākua while the replacement facility or facilities are being built. All of these alternatives – (1) training at Schofield Barracks, (2) training at Pohakuloa Training Area, (3) training at a replacement facility or facilities constructed at one or more existing military installations in Hawai'i, and (4) training at a replacement facility or facilities constructed on newly acquired training land – must be thoroughly analyzed, as required by 40 C.F.R. § 1502.14(b), so that reviewers may evaluate their comparative merits."

Additional Comments

Due to the inadequate time allowed for review of the DEIS, Earthjustice has not been able to complete its review of the document. We offer the following comments regarding portions of the document we have reviewed:

- O1-4 | Page ES-3: It is not accurate to state that, since October 2004, the Army "has conducted limited training" at Mākua. To our knowledge, pursuant to the 2001 Settlement, no training has occurred at Mākua, since the Army failed to finalize the EIS in a timely fashion.
- O1-5 | Page ES-8: Tracer ammunition, which the Army proposes to use in Alternatives 2 and 3, was responsible for 49% of all recorded fires at Mākua (Beavers 1999). TOW missiles, rockets and illumination munitions, proposed as part of Alternative 3, were responsible for an additional 12% or more of training related fires (Beavers 1999). The Army has failed to demonstrate that it can re-introduce these weapon systems without violating its mandatory duty under the Endangered Species Act to avoid jeopardizing the dozens of critically imperiled species in the action area.

Responses

- O1-4
 The Army has conducted non-live fire exercises and training at MMR, including, but not limited to, aviation, fire buck training, unmanned aerial vehicle, and field maneuvers. No live-fire training has occurred since October 2004.
- O1-5
 The Army recognizes the risk of these weapons and has evaluated the wildfire risk related to each alternative in Section 4.14. The Army has worked with USFWS to develop mitigation measures and controls that are consistent with the Endangered Species Act. The USFWS issued a non-jeopardy opinion covering Alternative 3 (preferred Alternative) of the EIS. No training at MMR would occur without compliance with Section 7 of the Endangered Species Act.

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- O1-6

Page ES-9: The Stryker does not weigh 19 to 20 tons, as stated. According to the U.S. Government Accountability Office, with add-on reactive armor, the Stryker weighs up to 25 tons. See Exhibit 8. If the Army intends to use Strykers at Mākua, it must disclose the areas lying within the surface danger zones (“SDZs”) of the Strykers’ various weapon systems, so the Army and public can be adequately informed of cultural sites and other resources at risk from misfired weapons.
- O1-7

Page ES-21: Having failed to comply with the requirement of the 2001 Settlement to test limu, fish and other marine resources relied upon for subsistence and in which toxins can bioaccumulate, the Army cannot reach any defensible conclusions about the significance of “human health and environmental effects” associated with contamination.
- O1-8

Page ES-31: The Army must disclose the areas lying within the SDZs of the rockets it proposes to fire at Mākua, which have “increased risk of misfiring,” so the Army and public can be adequately informed of cultural sites and other resources at risk from re-introducing these weapons.
- O1-9

Page 1-8: To fully inform the public about training alternatives, the Army must disclose the locations other than Mākua where it has performed CALFEXs since the 2001 Settlement Agreement was signed.
- O1-10

The Army’s suggestion that limitations on training at Mākua have adversely affected the 25th Infantry Division’s combat readiness is not supported by the Commander’s Assessment Letters. The Army cannot support its analysis with rhetoric; it needs to provide hard facts in the EIS.
- O1-11

Page 1-9: The Army’s claim that night training at Mākua is essential for readiness is not supported. The Army has not conducted any night training at Mākua since 1998 (at the latest), yet the 25th Infantry Division successfully trained to go to war in both Iraq and Afghanistan.
- O1-12

Page 1-10: The Army’s statement that use of “a replacement range facility should not require the closure of other training facilities or otherwise restrict training at nearby facilities” cannot be squared with the Army’s decision to pursue Stryker conversion despite the fact Stryker training “require[s] temporarily closing adjacent SBMR ranges” (page 2-40). If closing adjacent ranges is reasonable to accommodate Stryker training, why isn’t it reasonable to spare Mākua from training-related impacts?

Responses

- O1-6
 The Stryker in Hawaii is not scheduled to have add-on armor, and therefore its weight is correctly set forth in the Draft EIS. The surface danger zones for weapons mounted on Stryker at the fixed firing points are the same for those weapons in a dismounted role.
- O1-7
 Sediments collected from the different muliwai were analyzed for various compounds including metals and explosives. Analytical results did not identify any chemicals of potential ecological concerns since the levels found are low (either non-detected, or barely above detection limits), and infrequent (i.e. only 1 sample out of 54 showed RDX at 0.23 mg/kg). A detailed discussion of the analytical data collected for the muliwai is included in Appendix G-3 of the Draft EIS. Further testing for contaminants in ecological receptors at the muliwai (e.g fish and limu) has been undertaken and found that there is a relatively minor health risk to subsistence and recreational fisherman consuming marine resources from the MMR muliwai and nearshore areas.
- O1-8
 The SDZ for rockets is included in the 2007 BO (Reference Appendix G)
- O1-9
 This information was included in Section 1.1 of the Draft EIS.
- O1-10
 Training requirements are constantly changing based on lessons learned in combat, training events, new equipment, and new commanders. Using historical data to assess future needs is faulty logic. Combat readiness is an assessment based on a Commander's experience and training, and therefore is a matter of discretion.

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(cont.)

O1-11

The Army must be prepared to fight in all conditions and at all times. Accordingly, to be combat ready, night training is essential. Combat readiness is an assessment based on a Commander's experience and training, and therefore is a matter of discretion. Night fire was not conducted at MMR since 1998. The primary concern was the threat of fire from tracer ammunition. The units that deployed conducted limited night training at Schofield Barracks and PTA to meet deployment requirements. MMR is still required to accomplish the full spectrum of night training.

O1-12

Due to increased training requirements resulting from transformation increases in numbers of squads, platoons, and companies in newly configured brigades, the Army requires both BAX and CALFEX capabilities on the island of Oahu. The BAX would not fit on MMR, therefore, it is being constructed on Schofield Barracks.

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- O1-13

Page 1-2:

The Army’s suggestion it may defer its hydrophonic noise study to determine impacts associated with live-fire training until after the EIS is completed and the decision to train at Mākua has already been made turns the National Environmental Policy Act’s statutory scheme on its head. The Army is obliged to analyze and disclose to the public the impacts of training at Mākua before deciding whether to resume such training. Failure to disclose these impacts in a DEIS that is made available for public review defeats NEPA’s purpose to ensure the Army’s decisions “are based on understanding of environmental consequences.” 40 C.F.R. § 1500.1(c); see also *id.* § 1502.22.
- O1-14

The Army’s claim it has completed surface archaeological surveys within the south firebreak road and all SDZ areas is baseless, as Figure 3-24 makes clear.
- O1-15

Page 2-34:

The DEIS fails to disclose additional risks of wildfire or damage to cultural sites associated with conducting live-fire from C-Ridge, which the Army proposes as part of Alternative 3. It is self-evident that conducting live-fire training outside the firebreak system poses unique risks of catastrophic wildfires. These risks must be evaluated and disclosed.
- O1-16

Page 2-36 to
Page 2-37:

The DEIS fails to justify why, to satisfy the purpose and need of military preparedness, military training must take place “in an existing training area” or why only training areas on O’ahu would be close enough to Schofield Barracks to be practical. The DEIS must examine construction of new training areas, either at existing military installations or on newly acquired land. In addition, given the speed with which the new Spearhead can transport soldiers, the DEIS must consider training opportunities on neighbor islands, including, but not limited to, training at Pōhakuloa.
- O1-17

Page 2-39 to
Page 2-40:

The Supplemental Environmental Assessment for Routine Training at Makua Military Reservation (May 15, 2001) includes an extensive discussion of how the Army could realign ranges at Schofield Barracks to create a training facility to replace Mākua (SEA, pages 35-38). The DEIS improperly rejects such an alternative out of hand. If realigning ranges at Schofield is feasible to allow for Stryker conversion, it is feasible to allow for construction of a replacement for Mākua. Even if training at Mākua were needed in the short-term while a replacement facility were being built, such an approach would reduce impacts at Mākua in the long-term and, thus, must be considered.

- O1-13

Per the NOAA consultation, a hydrophonic study will be conducted during the first CALFEX event at MMR. Results of that study will be used in further consultation with NOAA. At the present time, NOAA has concurred with the Army’s “not likely to adversely affect” determination for marine resources based on the hydrophonic model. The Army consulted with NOAA and they concurred.
- O1-14

Figure 3-24 has been revised to reflect current improved conventional munitions (ICM) areas and impact areas. The Army has completed surface and subsurface archaeological surveys within the south firebreak road consistent with its legal obligations and NEPA. To the extent permitted by law, the Army has included such survey results in Appendix G-9.

The Army has Surveyed all of the SDZs inside the south firebreak road and those portions of the SDZ outside the firebreak road that are deemed safe.
- O1-15

Per the 2007 Section 7 consultation process the Army has decided not to use C-ridge due to the high risk of wildfire.
- O1-16

Section 2.5 has been revised to address construction of replacement training facilities. The high speed transport capabilities are currently not available for designated use by the 25th ID.
- O1-17

The 2001 SEA points out that building a MMR replacement on Schofield Barracks would require reconfiguration and realignment of all but two existing ranges. The BAX at Schofield is a completely different range and meets different requirements. In addition, the Army’s doctrinal requirements are not the same today as they were in 2001.

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O1-18	Since soldiers training at Schofield Barracks do not need to bivouac, the Army must consider whether less land would be needed to conduct CALFEXs there, as compared to installations where soldiers do not have housing.
O1-19	If conducting CALFEXs at Schofield Barracks would displace needed small arms target practice, the Army should consider reducing impacts at Mākua by conducting CALFEXs at Schofield and moving small arms target practice to Mākua.
O1-20	Page 2-42: Even if training at the NTC, JRTC, and other continental military installations cannot completely eliminate the need for the training proposed for Mākua, the DEIS must consider alternatives in which training at these other installations significantly reduces the amount of training, and thus the impacts, at Mākua.
O1-21	Page 3-2: Prior to any restrictions on training at Mākua associated with litigation over the Army's compliance with environmental laws, the Army conducted far fewer CALFEXs – 15 in fiscal year 1997 and 18 in fiscal year 1998 – than it currently proposes in even its “reduced capacity use” alternative. The Army must justify its asserted need for so many training exercises at Mākua. Mere rhetoric is insufficient.
O1-22	Page 3-5 to Page 3-8: As discussed above, the Army is obliged to complete its hydrophonic noise study and submit its analysis to public review as part of the EIS process. The same goes for the Army's hydrogeologic investigation and cultural resources studies.
O1-23	Page 3-44 to Page 3-45: How can the Army possibly justify claiming an activity is “compatible with noise-sensitive land use” if 15% of the population (nearly 1 in 7 people) is “highly annoyed”?
O1-24	Page 3-81: The DEIS fails to justify its reliance on Ecological Data Quality Levels for Surface Water developed by EPA Region V, which serves Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Hawai'i's ecosystems bear no resemblance to the ones found in these Midwestern states.
O1-25	Page 3-110: It is completely irrelevant whether some of the metals that contribute to the elevated hazard index for combined non-cancer risks are “present at typical background soil concentrations.” If the addition of contaminants from the Army's activities to background concentrations results in excessive non-cancer risks, that is a significant impact that must be addressed in the EIS.

O1-18
 The CALFEX scenario described in the EIS normally requires the Soldiers to bivouac. The sequence of continuous training events does not allow for troops to be released and equipment secured. This is a common practice across the Army.

O1-19
 MMR does not provide enough space for small arms target qualification ranges to support all Army units assigned to Hawaii. In addition, the small arms training would present a greater fire danger than CALFEX training due to the increased volume of ammunition expended. Since small arms target qualification ranges are used at least 300 days per year, Soldiers and their ammunition would have to convoy back and forth to Schofield Barracks every day, greatly impacting traffic and public safety.

O1-20
 The number of training events in each alternative is the maximum number that the military would conduct in any one year. For any given year, the military may conduct fewer exercises at MMR due to training opportunities elsewhere. However, it is difficult to predict these future opportunities, and therefore they cannot be accurately assessed in the EIS. Also, should those opportunities become unavailable, the military would rely on MMR to accomplish its training requirements.

While units have been assessed in the past as ready for combat without conducting live-fire training exercises at MMR, the Army was forced to undertake training work-arounds to include training at locations outside of the state of Hawaii. These work-arounds were both time consuming and costly. Additionally, the lack of home-based live-fire training capability has an impact on Soldier morale as more time is spent away from family, which is not quantifiable in Unit Status Reports.

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O1-21

During the period in question, many additional training events were actually conducted during those years. These events involved primarily platoon events. The EIS now explains how many events of different types can be expected to occur at MMR. It is important to note that since 1998, the training requirements of units have changed because of their changing missions and evolving doctrine. The Stryker Brigade's use of MMR is limited and is discussed in Ch 2.

O1-22

Due to the lack of full training at MMR, the Army has been unable to conduct hydrophonic noise testing of a representative CALFEX. Hydrophonic noise modeling has been conducted and the modeling report was included as Appendix G-5 in the Draft EIS. The noise modeling results provided data for the impact analysis. The hydrogeological investigation has been completed and the investigation report was included as Appendix G-1 of the Draft EIS. The archaeological subsurface survey has been completed and the survey report was made available for a 60-day public review.

O1-23

The noise zone definitions were calculated by the Army's noise exposure experts and established in the Army's 2001 Environmental Noise Management handbook

O1-24

The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate. Ecological values similar to PRGs are not published for EPA Region IX, so in the absence of this information the EPA Region V Ecological Screening Levels are used as a comparative to provide an indication of potential impacts. The Region V Screening Levels have been used outside of Region V for comparison of data by other EPA Regions.

O1-25

The Army appreciates your input.

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O1-26

Page 3-111: The USGS study finding high levels of organochlorine pesticides in fish on O‘ahu underscores the need for the Army to carry out, as part of the EIS process, contamination studies of fish on which Wai‘anae Coast residents rely for subsistence, as required by the 2001 Settlement.

Thank you for your attention to these comments. Please feel free to contact me if you have any questions or concerns.

Sincerely,

David L. Henkin

DLH/tt
 Attachments

ATTACHMENTS

- Exhibit 1: Tab TR-30 from Administrative Record in Mālama Mākua v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK): Commander’s Assessment Letters (December 2000).
- Exhibit 2: Documents produced in response to Request No. 15 of Plaintiff’s First Set of Interrogatories and Request for Production of Documents and Things in Mālama Mākua v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK) (July 25, 2001) (excerpts).
- Exhibit 3: Tab TR-31 from Administrative Record in Mālama Mākua v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK): Email: CALFEX Slides (April 13, 2001) (excerpts).
- Exhibit 4: Tab TR-35 from Administrative Record in Mālama Mākua v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK): Email: CCAAC construction time (Mar. 13, 2001).
- Exhibit 5: Tab TR-45 from Administrative Record in Mālama Mākua v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK): Makua Utilization Days (1988-1998).
- Exhibit 6: Malia Zimmerman, “Makua Valley and the Modern Army,” Midweek (June 5, 2002).

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O1-26

Organochlorine pesticide levels in surface and ground water samples at MMR were less than significant. The referenced USGS study found high levels of organochlorine pesticides in fish tissue in urban and mixed land use; this study did not indicate this compound resulted from Army activities, moreover, sampling was conducted at MMR of soil, sediment, surface water, and groundwater with no pattern of contamination that would impact off-site receptors. The Army conducted another study of the marine resources for the muliwai and Makua Beach near shore area, published in 2007. The 2007 report indicates that based on the analytical data, it does not appear that training activities at MMR contribute to contaminants detected in the marine resources.

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Exhibit 7: Gregg Kakesako, "Isles to see Army's Spearhead," Honolulu Star-Bulletin (Aug. 12, 2005).

Exhibit 8: U.S. Government Accountability Office, "Military Transformation: Fielding of Army's Stryker Vehicle Is Well Under Way, but Expectations for Their Transportability by C-130 Aircraft Need to Be Clarified," GAO-04-925 (Aug. 2004).

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EARTHJUSTICE

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April 3, 2007

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Re: Makua Military Reservation Draft Environmental Impact Statement

Dear Mr. Shirakata,

This letter, together with its attachments, supplements the comments Earthjustice offered at the public hearings in August 2005 and February 2007 on the Army's Draft Environmental Impact Statement ("DEIS") regarding military training activities at Makua Military Reservation ("Makua"), as well as the written comments provided on October 6, 2005, during the initial public comment period on the DEIS.

Marine Resources Study

As discussed with the Army's counsel, due to the delay in our receipt of the non-privileged documents used in the preparation of the Marine Resources Study, Earthjustice will provide detailed comments on this study following the completion of review by Mālama Makua's experts. At this point, we emphasize only that the Marine Resources Study's failure to examine whether shellfish near Makua Beach and in the muliwai are contaminated violates the terms of the January 8, 2007 Joint Stipulation Re: Partial Settlement Of Plaintiff's Motion To Enforce The October 4, 2001 Settlement Agreement And Stipulated Order ("2007 Order"), which expressly requires that shellfish be tested. 2007 Order ¶ 6. To comply with its legal obligations, the Army must complete another study focusing on potential contamination of shellfish, put the study out for public review and comment, and incorporate its analysis into the final EIS. *Id.* ¶¶ 6, 11-13.

Draft Archaeological Subsurface Survey

The Army has failed to satisfy its legal obligations regarding archaeological surveys. The 2007 Order provides that the Army "shall complete surface and subsurface archaeological surveys of all areas within the Company Combined-Arms Assault Course ["CCAAC"] circumscribed by the south firebreak road, except that the area within the firebreak road identified as containing improved conventional munitions ("ICMs") ... shall be surveyed only if the Headquarters, Department of the Army ('HQDA'), grants the appropriate waiver, which the

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25th Infantry Division ('25th ID') will make good faith efforts promptly to secure." 2007 Order ¶ 1 (emphasis added). Even assuming the 25th ID fulfilled its obligation to seek an ICM waiver and the HQDA denied the waiver (we have yet to receive documentation regarding this matter, despite repeated requests), the Army has yet to comply with the order's requirement to complete surface surveys of non-ICM areas within the south firebreak road. See 12/22/05 Lucking Deposition at 21:1-23:22, 24:19-25:2 & Exh. 2 (no archaeological surveys in southeastern lobe of CCAAC and, possibly, in area to west of Sites 5587 and 5589).¹

The Draft Archaeological Subsurface Survey that is currently out for comment does not satisfy the Army's obligations, even with respect to only subsurface surveys. In the notification provided to the State Historic Preservation Officer, the Army acknowledged that, due to its extremely limited scope, the subsurface survey would not produce "a representative sample of the designated survey area" and, thus, "has limited potential of producing significant data about the whole of Mākua." 11/17/05 Letter from Alan Goo at 2 (included in Appendix A to survey). The Army cannot discharge its obligation to "complete ... subsurface archaeological surveys of all areas within the [CCAAC]" through a study which, by design, cannot provide representative information about the subsurface archaeological resources found there and threatened by proposed training. 2007 Order ¶ 1; see also 3/26/07 Dye Report (research design inadequately described and executed).

Dr. Thomas S. Dye's review (enclosed), which is incorporated herein by reference, highlights significant flaws in the subsurface survey's methodology. Even assuming for the sake of argument the Army could justify the way in which it stratified its sampling (and Dr. Dye explains why it has not), its selection of a sampling interval of 20 meters means that, if "the expected site type is a subsurface deposit with a radius of 5 meters," the survey would "stand a good chance of missing more than it found." Dye Review at 2-3. In fact, the Army's past subsurface surveys have revealed that expected site types include archaeological resources much smaller than 5 meters in radius. For example, at Site 4543, the Army's contractors previously found an *imu* (underground oven) measuring only 56 cm by 40 cm and a post mold that was only 10-20 cm in diameter (i.e., only 5-10 cm in radius). See GANDA, Archaeological Subsurface Testing and Survey of Sites in the CCAAC at 52 (July 2005). By selecting a survey methodology that would not allow it to locate the types of subsurface resources found at Mākua, the Army clearly has not completed subsurface surveys of "all areas" as the 2007 Order requires.

Moreover, as Dr. Dye points out, having determined it needed 350 excavations to carry out its stratified random sampling, the Army did not even complete that field work. Dye Review at 3-4. The presence of possible unexploded ordnance, one of the reasons frequently given for

¹ If surveys of these unsurveyed areas were completed subsequent to Dr. Lucking's deposition, the Army was obliged to circulate the surveys for public review and comment as part of the DEIS process. See 2007 Order ¶¶ 11-12. Likewise, if, as Dr. Lucking claimed, the Army has completed surveys in the northeastern lobe of the CCAAC, it was required to give the public an opportunity to comment on them. See Lucking Deposition at 23:24-24:17. The failure to circulate archaeological surveys for public review and comments constitutes separate violations of the Army's legal duties.

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The Army did ask for an ICM waiver, but it was denied. The Army has provided correspondence reflecting this denial to Earthjustice. The surface archaeological surveys have been completed.

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abandoning an excavation, does not excuse the Army's failure to complete its survey. The 2007 Order requires the Army to "make good faith efforts to clear unexploded ordnance ('UXO') as necessary to complete the subsurface archaeological surveys within the south firebreak road." 2007 Order ¶ 1. Thus, the Army should not have failed to excavate a probe merely because a "metal anomaly" indicated UXO might be present. Survey at 7.²

Even if a randomly selected site were, for whatever reason, inappropriate for excavation, to complete its survey, the Army should have excavating another randomly selected site to preserve the integrity of its sampling design. See Dye Review at 3-4. Having failed to survey 73 of the 350 shovel probes planned for the subsurface survey (over 20%), with a failure to excavate 67 of 200 planned probes in Area 2 (over 33%), the Army fell far short of completing its otherwise deficient survey.³

Overall, to comply with the 2007 Order, the Army must conduct additional surface and subsurface surveys of the areas within the CCAAC circumscribed by the south firebreak road, put those additional surveys out for public review and comment, and then incorporate an analysis of the surveys' results into the final EIS. 2007 Order ¶¶ 1, 11-13.

While the Army has not yet completed the required archaeological surveys, it is notable that, whenever it does survey, it continues to find new cultural resources, including new surface features like the possible burial mounds located near Shovel Probe #270, within the surface danger zones of the artillery and mortars the Army proposes to use at Mākuā. The new discoveries highlight the substantial threat of irreparable harm to irreplaceable cultural resources posed by the Army's proposed undertaking.

Training at Mākuā Not Necessary To Accomplish Army's Mission

Due to the Army's failure to complete the EIS prior to October 4, 2004, the Army has not fired a single round at Mākuā in nearly three years. Since September 1998, only a total of twenty-six live-fire exercises have been conducted at Mākuā. During that same time, the 25th ID has deployed several times to war in both Iraq and Afghanistan, as well as combat missions in the Philippines and elsewhere. The 25th ID clearly can perform its mission without live-fire training at Mākuā, calling into doubt the Army's entire justification for its proposed action.

² If the Army believed that safety concerns precluded clearing the UXO, it was obliged to meet and confer with Mālama Mākuā "in a good faith attempt to resolve the concerns." *Id.* The Army failed to do so, again violating its legal obligations.

³ The failure to complete a third of the excavations in Area 2, which the Army had determined had "a better probability that there would be intact cultural deposits" and of "find[ing] archaeological evidence of cultural occupation," likely resulted in numerous cultural sites being overlooked. 11/17/05 Letter from Alan Goo at 2.

Responses

O2-2

Training requirements are constantly changing based on lessons learned in combat, training events, new equipment, and new commanders. Using historical data to assess future needs is faulty logic. Times of war, such as now, drastically change training requirements. While units have been assessed in the past as ready for combat without conducting live-fire training exercises at MMR, the Army was forced to undertake training work-arounds to include training at locations outside of the state of Hawaii. These work arounds were both time consuming and costly. Additionally, the lack of home-based live-fire training capability has an impact on Soldier morale as more time is spent away from family, which is not quantifiable in Unit Status Reports.

O2-3

As demonstrated in the report submitted pursuant to the National Defense Authorization Act for Fiscal Year 2007, the Army does not have sufficient live training ranges to accomplish all the required live-fire training for 25th ID units without MMR, not to mention the Marines and Reserve Component units. A summary of the report has been added to Section 2.2 of the EIS. Because that report and the EIS were prepared to meet different requirements, the training options discussed in that report are not necessarily suitable for evaluation in the EIS. Section 2.5 of the EIS has been revised to address construction of replacement training facilities.

The EIS considered other alternatives in Section 2.5. The EIS now includes evaluation of an alternative in which training proposed for MMR would be conducted at the Pohakuloa Training Area, island of Hawaii (See Chapter 2 for a description of this alternative). This alternative was added in response to public comments received on the Draft EIS. Use of MMR, however, remains the preferred alternative.

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Failure to Consider Reasonable Alternatives

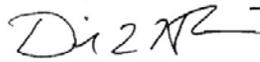
O2-3 In the National Defense Authorization Act for Fiscal Year 2007, Congress required the Army to submit, no later than March 1, 2007, a report on, among other things, “[c]ost and schedule estimates for the construction of new ranges or the modification of existing ranges that are necessary to support future training requirements if existing restrictions on training at the Mākua Valley range remain in place.” Pub. L. 109-364, § 343(4), 120 Stat. 2083, 2155 (2006). Unfortunately, the Army has not yet submitted the report, and, thus, the public remains in the dark regarding the new ranges or modifications to existing ranges the Army has identified as substitutes for culturally and environmentally destructive training at Mākua. While the public currently is unaware of the report’s contents, the Army knows full well the suite of alternatives on which it intends to report. All such alternatives must be examined in a revised DEIS, which must be circulated to the public for review and comment. See 40 C.F.R. § 1502.9(a).

O2-4 Among alternate locations, the revised DEIS should consider in detail conducting training at Pōhakuloa Training Area (“PTA”) on Hawai’i Island. Even if the DEIS is correct in claiming that appropriate facilities to conduct company-level combined-arms live-fire exercises do not “presently exist[]” at PTA, such facilities could be constructed, as the extensive construction program proposed to accommodate the 2nd Brigade’s Stryker conversion illustrates. DEIS at 2-37. Any delay in constructing facilities at PTA would justify, at most, training at Mākua in the short-term, an alternative the DEIS improperly fails to consider. See Interview of Major General Benjamin Mixon by Gina Mangieri, KHON2 News (Dec. 13, 2005).

O2-5 While the DEIS characterizes the need to deploy soldiers from O’ahu to PTA as a negative, the Army’s internal documents see it otherwise. The April 2003 Land Use Requirement Study emphasizes that “the separation of 25th ID (L) and USARHAW training area between the Islands of Oahu and Hawaii” is a “major benefit[],” providing “outstanding training opportunities.” Id. at ES-5. The study observes that “[t]he deployment/redeployment execution associated with one of these exercises [at PTA] adds to a realistic training scenario based on the units’ mission essential task list (METL).” Id.

Thank you for your attention to these comments. Please feel free to contact me if you have any questions or concerns.

Sincerely,



David L. Henkin

DLHtt
Attachments

Responses

O2-4

The EIS considered other alternatives in Section 2.5. The EIS now includes evaluation of an alternative in which training proposed for MMR would be conducted at the Pohakuloa Training Area, island of Hawaii (See Chapter 2 for a description of this alternative). This alternative was added in response to public comments received on the Draft EIS. Use of MMR, however, remains the preferred alternative.

O2-5

The document that describes the separation of Oahu and Pohakuloa Training Area as an outstanding training opportunity refers to the movement between islands and not live-fire training. It also discusses the movement of a battalion, not a company, to Pohakuloa for 30 days. The 30 days does not include travel time. Company-level CAL-FEX take each company 5 days to complete. It would take 60 days to run all 12 companies in the average battalion through this training. The document also notes there are significant shortfalls in live-fire ranges for the 25th ID and that the costs to travel to train at Pohakuloa have increased significantly.

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ATTACHMENTS

1. Thomas S. Dye, Ph.D, Review of Archaeological Subsurface Survey Within the Company Combined Arms Assault Course (CCAAC) Circumscribed by the South Firebreak Road, Makua Military Reservation, Mākua Ahupua'a, Wai'anae District, O'ahu Island, Hawai'i (March 26, 2007)
2. Resume of Thomas S. Dye, Ph.D
3. December 22, 2007 Deposition of Laurie Lucking, Mālama Mākua v. Rumsfeld, Civ. No. 00-00813 (SOM)(LEK) (excerpts)
4. GANDA, Archaeological Subsurface Testing and Survey of Sites in the CCAAC at 52 (July 2005) (excerpts)
5. Interview of Major General Benjamin Mixon by Gina Mangieri, KHON2 News (Dec. 13, 2005) (excerpts)
6. 25th Infantry Division (Light) & United States Army Hawaii, Range and Training Land Program, Land Use Requirement Study (April 2003) (excerpts)

Comments

Responses

T. S. Dye & Colleagues, Archaeologists, Inc.

735 Bishop St., Suite 315, Honolulu, Hawai'i 96813

*Review of Archaeological Subsurface Survey Within
the Company Combined Arms Assault Course
(CCAAC) Circumscribed by the South Firebreak
Road, Makua Military Reservation, Mākua Ahupua'a,
Wai'anae District, O'ahu Island, Hawai'i*

Thomas S. Dye, Ph.D.

March 26, 2007

Contents

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Abstract

Review of the subject report indicates that it needs to be revised and augmented. As the report stands, it is not possible to determine whether the subsurface survey was designed and carried out to current professional standards. It does appear, however, that the survey work was not completed and that *additional field work* is needed to fulfill the (inadequately described) research design.

1 Introduction

At the request of David Henkin, Earthjustice, on behalf of Mālama Mākua, T. S. Dye & Colleagues, Archaeologists, Inc. has reviewed a report entitled *Archaeological Subsurface*

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3 METHODS

Survey Within the Company Combined Arms Assault Course (CCAAC) Circumscribed by the South Firebreak Road, Makua Military Reservation, Mākua Ahupuaʻa, Waiʻanae District, Oʻahu Island, Hawaiʻi prepared by U.S. Army Garrison, Hawaii. The goals of the review were to determine if the archaeological subsurface survey was designed and carried out to current professional standards.

2 General Comments

The report makes some general comments on the circumstances under which the archaeological subsurface survey was conducted.

O2-6

Under normal circumstances, a subsurface survey of this nature would be unlikely. Resources would not readily be invested into man hours to conduct a subsurface survey in areas exhibiting no surface indication of archaeological features, a high level of soil disturbance, and low probability of uncovering intact cultural deposit. For these reasons, subsurface testing at MMR has, in the past, always been completed within site areas or where construction has necessitated archaeological testing be done (see Section 1.1 for reference to subsurface testing projects). Moreover, subsurface archaeological investigations destroy the integrity of cultural remains, and in recent years, have been conducted less to demonstrate cultural sensitivity for the preservation of sites.

The negative attitude toward excavation outside areas with surface architecture in this paragraph reflects a somewhat outdated view of the Hawaiian archaeological landscape. The Archaeology Working Group convened by the Department of Land and Natural Resources in 2006 drafted a statement that urged archaeologists to dig outside areas with surface architecture. Too often, Hawaiian archaeologists use an idiosyncratic definition of "site" to mean "surface architecture," instead of its more usual referent to a "place where remains of human activity are found." This definition works to confine investigation to areas with surface architecture. Studies now show that extant surface architecture is generally fairly recent, representing only the last 100–200 years of Hawaiian prehistory. Excavations in areas outside surface architecture are crucial to understand the full time depth of Hawaiian culture. This paragraph, with its devaluation of subsurface survey in "areas exhibiting no surface indication of archaeological features," appears to carry forward one of the unfortunate biases of the idiosyncratic definition of site. In any event, its motivation appears to be displeasure at having to undertake the survey rather than some scientific principle. It seems out of place in a document of this type and should either be deleted or rewritten so that it reflects a more objective stance.

3 Methods

The methodology section is incomplete and one can't make sense of it as it stands. It leaves unaddressed a fundamental question: what are the expected site types the survey was designed to find and what are their attributes? For example, if the expected site type

O2-6

Army responses to the Dye Report are included in Appendix G-9

Comments

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is a subsurface deposit with a radius of 5 m, then a sampling interval of 20 m, such as the one used here, would obviously stand a good chance of missing more than it found. Without some attention to this question, the reader can only guess at the adequacy of the sampling design. This is not an acceptable situation in a report of this type.

In the section on stratified random sampling, the attributes used to stratify the survey area need to be related directly to the likelihood of finding cultural deposits. How does terrain affect the likelihood of finding cultural deposits? What is the nature of the former ground disturbance and how does it affect the likelihood of finding cultural deposits (including secondary deposits)? How was "site probability (based on results of former fieldwork)" calculated? The attributes must be described in such a way that another researcher could use them to arrive at a division of the survey area similar to the one used in this report. It would be well to rank Areas 1, 2, and 3 according to the *a priori* likelihood of finding cultural deposits.

The section on stratified random sampling needs to indicate the area of each of Areas 1, 2, and 3, calculate the density of sampling units for each Area (number per unit area), and relate this to the ranking of the Areas by *a priori* likelihood. It should be the case that the Area with the highest *a priori* likelihood of finding cultural deposits is also the Area with the highest density of sampling units. This correspondence needs to be demonstrated in this section.

In the Field Methods section, it should be noted that the decision not to excavate in the vicinity of surface architectural remains was not followed consistently. Two excavations within terraces are described on page 19.

4 Results

The Results section indicates that about 20% of the planned excavations were not carried out due to a variety of factors. It is typical in surveys of this type to generate a surplus of random numbers so that sampling units that can't be excavated at one place can be excavated at some other random location. This is done so that the designed sampling density is maintained. Given that this was not done, and following on the comments above, the density of *excavated* sampling units in each of the Areas should be calculated and related to the *a priori* ranking of the Areas by likelihood of finding cultural deposits. There are a couple of pertinent questions here: a) did the change in excavation effort have any effect on the stratified sampling design, i.e., was the area of highest likelihood actually sampled at the highest density, etc.; and b) did the reduction in sampling effort affect the likelihood that sites of the type expected during the survey would be found?

The potential problems introduced by the reduction of sampling effort, which was especially marked in Area 2, might have been alleviated by the excavation of some 200 probes along a road, which was carried out when a burn of the area failed. In general, however, excavation in the vicinity of roads often yields more information about road construction than it does about archaeological sites that were present before the road was built, and this appears to be the case in this project, where the test units were excavated in "highly disturbed areas" (p. 8). Thus, the systematic sampling does not appear to have substituted for the units that were not excavated. The obvious conclusion is that the field work for this project was not completed.

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Presumably, excavation of 477 sampling units yielded quite a bit of stratigraphic data. It is the usual case that even negative results are reported at a level of detail that will make them useful to future researchers. That appears not to be the case with this report, which lacks any stratigraphic profiles or detailed profile descriptions. It would not be necessary to present stratigraphic descriptions for all of the sampling units, however some sort of summary would be appropriate, perhaps one that identified stratigraphic zones, within which similar stratigraphic sections were displayed in the sampling units. A representative stratigraphic profile for each of the zones could then be described in detail.

Excavation of shovel probe #212 in Area 2 yielded a stratigraphic section that appears, on its face, to have contained a cultural deposit. This is the black, silty loam of layer II, which was found within a terrace. Its color, position in the stratigraphic profile, and location within a surface architectural feature are all what one would expect for a traditional Hawaiian cultural deposit. The report comments that "no cultural deposit was evident," but gives no reason to discount the evidence presented. What characteristics of the layer II deposit lead to the conclusion that it is not cultural?

5 Conclusions

Due to various deficiencies in the report, it is not possible to evaluate whether the design and conduct of the archaeological subsurface survey were carried out to current professional standards. During my six year tenure as O'ahu Island archaeologist with SHPD, I would not have provided a detailed review of such a deficient report, but would have sent it back to the author with a letter pointing out the major deficiencies and instructions that it be rewritten and resubmitted.

The sampling design is incompletely described so it is not possible to judge whether stratification of the survey area was rational and effective. Given this situation, it is an open question whether or not the level of sampling effort was a product of the research design or was based on other factors, not described. This is an important issue. Unless it can be resolved satisfactorily, no useful statements can be made about the likelihood that the area contains subsurface cultural deposits.

In any event, the sampling design was not fully implemented, especially in Area 2. If the sampling design were completely described, then it would be possible to determine what effect this had on the results. On the face of it, however, the unexcavated units would appear to compromise any reasonable research design. The decision to excavate 200 systematic sampling units along roads was clearly an error; these units appear to have had no chance of yielding cultural deposits. They certainly do not make up for random samples that were not excavated in Area 2.

The results of the survey are not reported in sufficient detail for a report of this type. The stratigraphic information that was collected needs to be summarized, perhaps in terms of areas that yield similar stratigraphic profiles. Representative profiles from each of the areas should be illustrated and described, so the reader can determine whether conclusions drawn from the stratigraphy are supported or not by the evidence at hand. In one case, a cultural deposit appears to have been excavated but not recognized.

5 CONCLUSIONS

Responses

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Responses

Résumé**Personal Information**

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 Fax (808) 529-0884
 E-mail tsd@tsdye.com
 Born 8/16/52, Watervliet, Michigan

Education

1987 Ph.D., Anthropology, Yale University
 1983 M.Phil., Anthropology, Yale University
 1980 B.A., Anthropology, University of Hawai'i at Mānoa

Archaeological Positions Held

2001-present President, T. S. Dye & Colleagues, Archaeologists, Inc.
 2004 Guest Lecturer on Bayesian Statistics for Archaeologists, University of Arizona
 1997-2001 Associate Archaeologist, Projects Manager, International Archaeological Research Institute, Inc.
 1997 Instructor, Historic Preservation Seminar, University of Hawai'i at Mānoa
 1991-1997 O'ahu Island Archaeologist, Department of Land and Natural Resources, State of Hawaii
 1987-1991 Associate Professor of Anthropology, Hawai'i Pacific University, Honolulu
 1987 Research Associate, B.P. Bishop Museum, Honolulu
 1984-1985 Associate Anthropologist, B.P. Bishop Museum
 1977-1978 Staff Contract Archaeologist, B.P. Bishop Museum

Professional Memberships

Hawaiian Historical Society, Past President
 Society for Hawaiian Archaeology, Past President
 Sigma Xi
 Society for American Archaeology
 Register of Professional Archaeologists

Comments

Responses

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Research Interests

¹⁴ C dating	Primary interests are identification of suitable dating materials, full specification of dated archaeological contexts, and Bayesian calibration. Recent focus on the ages of sites on the Waimānalo plain near the Bellows Dune site has shown that most of the plain was used late in traditional Hawaiian times, casting doubt on the hypothesis that the Bellows Dune site is a particularly old site.
Fish remains	Primary interests are fish remains identification, statistical analysis of collections, and interpretation of patterns across space and through time. Published a manual of fish remains identification with Ken Longenecker. Established collection size/diversity relationship for leeward Hawai'i Island. Developed a method to estimate the distribution of fish sizes from measurements of vertebrae centrum diameters. Discovered with Ken Longenecker that bonefish were a major component of the traditional Hawaiian fishing catch at Waimānalo.
Statistics	Primary interests are exploratory multivariate data analysis and its application to archaeological collections and statistical shape analysis. Developed graphical software for star plots distributed with the R Project for Statistical Computing and used this software package to invent a graphical display of large collections over the space of an excavation, which was applied to excavations at site 50-80-15-4856 on the Waimānalo plain. Developed a set of landmarks for shape analysis of fishhooks and am investigating shape changes over time for a large collection from Hawai'i Island.
Social change	Developing the necessary theory to evaluate and refine a hypothesis proposed by Rob Hommon concerning changes in rights of person of traditional Hawaiian commoners.

Publications

- [1] *An Archaeological Assessment of a Coastal Lot, TMK:(4)5-9-05:029, at Hā'ena, Halele'a, Kaua'i*. Prepared for Landmark Consulting Services Inc. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, July 2005.
- [2] *A Burial Treatment Plan for the Coastal Portion of Kaiholena Ahupua'a, North Kohala, Island of Hawai'i*. Prepared for Pohaku Kea, LLC. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, January 2005.
- [3] *Archaeological Monitoring Report for Architectural Barrier Removal Work at Ali'iolani Hale in Downtown Honolulu, Hawai'i (TMK:2-1-25-003)*. Prepared for Oceanic Companies, Inc. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, March 2004. With Jeffrey L. Putzi.
- [4] *Archaeological Survey of the Proposed Visitors' Quarters, Hickam Air Force Base, O'ahu, Hawai'i*. Prepared for Parsons. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, July 2004.

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- [5] *Data Recovery Plan for Sites in the Coastal Portion of Kaiholena Ahupua'a, North Kohala, Hawai'i (TMK:5-8-01:11)*. Prepared for Pohaku Kea, LLC. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, July 27 2004.
- [6] *Manual of Hawaiian Fish Remains Identification*. Number 1 in Special Publication. Society for Hawaiian Archaeology and Bishop Museum Press, Honolulu, 2004. With Ken Longenecker.
- [7] *Archaeological Monitoring Plan for Architectural Barrier Removal Work at Ali'iōlani Hale in Downtown Honolulu, Hawai'i*. Prepared for Oceanic Companies, Inc. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, January 2003. With Seamus T. Puette.
- [8] *Archaeological Survey of a Portion of Ke'ei Makai, South Kona, Hawai'i Island*. Prepared for Kamehameha Schools Land Assets Division. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, August 2003. With Kepā Maly.
- [9] *Revised Archaeological Inventory Survey at Kaiholena Ahupua'a, North Kohala, Hawai'i*. Prepared for Pohaku Kea, LLC. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, May 23 2003.
- [10] *Archaeological Data Recovery in the Barren Zone, Manini'ōwali and Kūki'o 2nd Ahupua'a, Kona, Hawai'i*. Prepared for W/B Manini'ōwali. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, June 2002.
- [11] *Archaeological Inventory Survey of Portions of Kekaha Kai State Park*. Prepared for Group 70 International. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, December 2002. With Maurice Major, Michael E. Desilets and MaryAnne B. Maigret.
- [12] *Archaeological Monitoring and Sampling During Bellows OU7 UST Removal Project Interim Remedial Action, Phase I, Bellows Air Force Station, Waimānalo, Ko'olaupoko, O'ahu*. Prepared for U. S. Army Corps of Engineers. International Archaeological Research Institute, Inc., Honolulu, January 2002. With Michael Desilets.
- [13] *Archaeological Monitoring Plan for Groundwater Investigation at the Pier Dump Site, Bellows Air Force Station, O'ahu, Hawai'i*. Prepared for CH2M Hill. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, November 2002.
- [14] *Archaeological Monitoring Report for Renovations to No. 1 Capitol District Building*. Prepared for Allied Construction, Inc. T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu, May 2002.
- [15] *Archaeological Survey of Sixty Acres of the Kīpahulu Historic District Within the Kīpahulu District of Haleakalā National Park, Maui*. Prepared for Haleakalā National Park. International Archaeological Research Institute, Inc., Honolulu, February 2002. With Mike T. Carson and Myra Tomonari-Tuggle.
- [16] *Archaeological Survey of Sixty Acres of the Kīpahulu Historical District, Within the Kīpahulu District of Haleakalā National Park, Maui*. Prepared for

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- Department of the Navy, Pacific Division, Naval Facilities Engineering Command. International Archaeological Research Institute, Inc., Honolulu, February 2002. With Mike T. Carson.
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