

**Comments**

**Responses**

Earthjustice Comments on Draft EIS for Mākua Military Reservation  
April 3, 2007  
Page 5

**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. 25<sup>th</sup> 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**

1	<b>Introduction</b>	1
2	<b>General Comments</b>	2
3	<b>Methods</b>	2
4	<b>Results</b>	3
5	<b>Conclusions</b>	4

**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*

## Comments

## Responses

2

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

3

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.

## Responses

## Comments

4

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

## Comments

## Responses

**Résumé****Personal Information**

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**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

2

**Research Interests**

<sup>14</sup> 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.

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## Comments

3

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## Responses

## Comments

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## Responses

## Comments

5

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## Responses

## Comments

## Responses

6

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## Comments

7

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## Responses

## Comments

## Responses

8

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Honolulu, Hawai'i, February 13, 2006

Comments

Responses

1

IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF HAWAII

MALAMA MAKUA, a Hawaii )  
non-profit corporation, )  
) )  
Plaintiff, ) CIVIL NO. 00-00813  
) )  
vs. ) )  
) )  
DONALD H. RUMSFELD, )  
SECRETARY OF DEFENSE; and )  
FRANCIS J. HARVEY, )  
Secretary of the United )  
States Department of the )  
Army, )  
) )  
Defendants. )

COPY

DEPOSITION OF LAURIE LUCKING

Taken on behalf of Plaintiff at the Law Offices of  
Earthjustice, 223 South King Street, Suite 400,  
Honolulu, Hawaii, commencing at 1:00 p.m. on  
December 22, 2005, Pursuant to Notice.

Transcribed by: RITA KING, RPR, CSR #373  
Court Reporter, State of Hawaii

ALI'I COURT REPORTING  
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Responses

2

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Comments

Responses

3

1	I N D E X		
2	WITNESS		PAGE
3			
4	LAURIE LUCKING		
5	Examination by Mr. Henkin		4
6			
7	E X H I B I T S		
8			
9	Deposition		
10	Exhibits	Description	Marked
11	1	Programmatic Agreement	11
12	2	Figure 3-24, Cultural Resource Features	21
13	3	Letter - Nov 17, 2005	26
14	4	Memorandum for the Record 22 November 2005	31
15	5	Memorandum for the Record 08 September 2005	42
16	6	Draft - Annual Report, 2004-2005	45
17	7	Archaeological Survey and Protection Of Cultural Resources During UXO Clearance Activities	55
18	8	Letter - 10-11-05	61
19	9	Memorandum for the Record 21 November 2005	63
20			
21			
22			
23			
24			
25			

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Comments

21

Responses

1 Q. I'll hand you a document and see if that  
2 refreshes your recollection.

3 A. The document is from the Draft  
4 Environmental Impact Statement, Military Training  
5 Activities at Makua Military Reservation, Hawaii,  
6 dated March, 2005.

7 Q. Do you see the legend on this Figure 3-24  
8 where it has a certain color that indicates  
9 surveyed areas?

10 A. Yes.

11 Q. What are the areas colored with that that  
12 color represents?

13 A. Those are areas in which we have done  
14 surface survey, what we call Phase I, presence  
15 absence.

16 Q. What's a Phase I, presence absence?

17 A. It's simply you walk across the surface  
18 to see if there's any surface indications of an  
19 archeological site.

20 Q. And as of what date and time does this  
21 reflect the areas that have been surveyed, surface  
22 surveyed?

23 A. This would have been early in 2004.

24 Q. Between early 2004 and when the draft  
25 Environmental Impact Statement went out for public

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Comments

Responses

22

1 review, were there any additional surface surveys  
2 that were conducted?

3 A. There are a few small scale surveys that  
4 were done by contract archeologists working for the  
5 Cultural Resources Program through the Research  
6 Council, University of Hawaii. And there was  
7 another survey that was done in August of this year  
8 after a burn within the South Fire Break Road, and  
9 in November there was subsurface testing that was  
10 completed within the South Fire Break Road.

11 Q. Did you participate in the preparation of  
12 the portion of the Draft Environmental Impact  
13 Statement that discusses the cultural resources at  
14 Makua?

15 A. I reviewed the document and commented on  
16 it.

17 Q. Does the figure that we've labeled as  
18 Exhibit 2 accurately reflect the extent of surface  
19 surveys that are discussed in the draft  
20 Environmental Impact Statement?

21 A. No, it doesn't.

22 Q. What differences would there be  
23 between --

24 A. Well, every place where there's a light  
25 pink there's been a surface survey.

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Comments

Responses

23

1 Q. Any other areas?

2 A. No.

3 Q. Focusing your attention on what is the  
4 eastern portion of the area within -- do you know  
5 what I mean when I say the South Fire Break Road?

6 A. Yes, I do.

7 Q. Focusing your attention on the eastern  
8 portion, are there areas that were unsurveyed as of  
9 the time of the Draft Environmental Impact  
10 Statement's preparation?

11 A. The southeastern lobe of the fire break,  
12 the one that is currently blue, has not been  
13 surveyed.

14 Q. Has it been surveyed subsequent to the  
15 preparation of the draft EIS?

16 A. No, it has not.

17 Q. Could you please circle in black the  
18 portion that you're referring to there.

19 A. (Witness indicating.)

20 Q. And could you draw a line down into a  
21 white margin and write "not surveyed," please.

22 A. (Witness indicating.)

23 Q. Thank you.

24 If you look at the northeast corner of  
25 the area within the South Fire Break Road, do you

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Comments

Responses

24

1 see an area that appears to be purplish blue?

2 A. That should be Brown.

3 Q. When you say it should be brown, was it  
4 surveyed as of the time of the Draft --

5 A. Yes, it was.

6 Q. If you could let me finish the question,  
7 it'll insure -- I realize it's not natural, but  
8 it's the construct we're operating under.

9 So with reference to the northeast lobe  
10 of the South Fire Break Road, was that surveyed as  
11 of the time of the preparation of the Draft  
12 Environmental Impact Statement?

13 A. Yes, it was.

14 Q. If you could circle that area using the  
15 black pen and draw a line to a white portion and  
16 write "surveyed."

17 A. (Witness indicating.)

18 Q. Thank you.

19 And immediately to the west of sites  
20 number 5587 and 5589 there appears to be a  
21 bluish-purple area. Do you see that?

22 A. Yes, I do.

23 Q. Was that surveyed at the time of the  
24 Draft Environmental Impact Statement?

25 A. I am unsure about that.

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