

POKANELOA

CULTURAL SIGNIFICANCE OF POKANELOA



Pokaneloa is a unique cultural resource that “reveals time, space, and seasons of Kane and Kanaloa, an earthly reflection of the sky. The area has a lot of mana; it reacts to the time, the space and season when the sun of Kane and Kanaloa meet in the sky.” Therefore, it was strongly recommended that by stabilizing the area that supports Pokaneloa, one will be able to “testify to the intelligence, training, spiritual guidance and experience that were needed to settle on the immediate location to carve the pohaku in correlation with the sun’s rotation and seasons, and finally to be in timing with the solstices and equinoxes” (Kanahele et al., 2009:6).

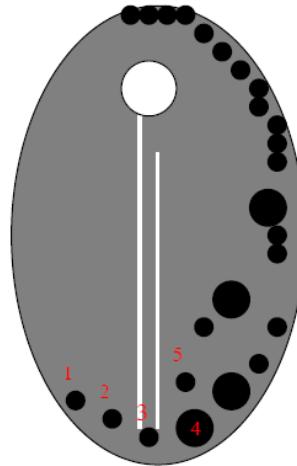
The first sun study was done on 21MAR2008 at sunset

After several trips to Loa'a it has become obvious that the stone is the culmination of the Kāne and Kanaloa suns. The middle line found on the stone is the Ke ala piko o Wākea that separates the Kāne and Kanaloa skies, more correctly suns. The visits that affix the sun's relationship to Kāneloa occurred on equinox, March 21, 2008. The following is a short report made by 'Aikāne 'Alapa'i and substantiated by Kalei Nu'uhiwa and Kaumakaiwa Kanaka'ole on March 21, 2008.

Kaho'olawe

When the sun reaches a certain point above the horizon it begins to swing or bend due to the curvature of the earth, the term for this is called ke'eke'e. I believe that one of the functions of the pōhaku Kāneloa is to measure the curvature of the earth as it relates to the sun. The way our measurements were conducted during sunset was to place a long upright stick directly west of the pōhaku and as the sun sets, record the measurement in time and distance in inches on the poho of Loa'a as the shadow moves from one side to the other. We first recorded data in increments of 30 minutes but at 5:00 pm switched to recording every 15 minutes due to the shadow becoming faint from the quickly setting sun.

- 4:30 pm -- Shadow on poho #2
- 5:00 pm – Shadow between poho #2 and #3
4.25 inches from poho #1
- 5:15 pm – Shadow on poho #3
6 inches from poho #1
- 5:30 pm – Shadow between poho #3 and #4
10.25 inches from poho #1
- 5:45 pm – Shadow on poho #4
14 inches from poho #1
- 6:00 pm – Shadow on poho #5
16.25 inches from poho #1



There are two reasons why I feel that this sun study is important:

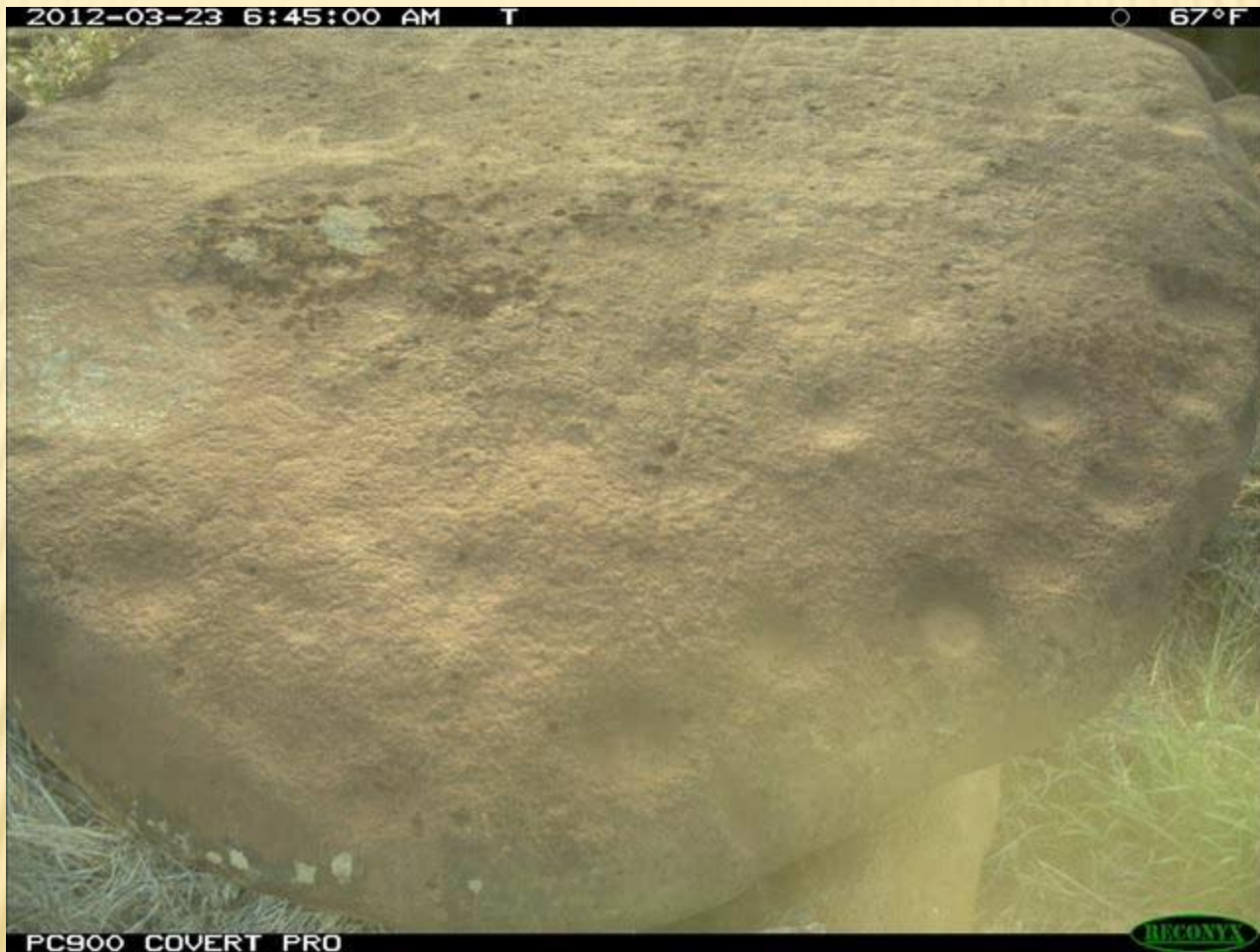
1. To document and witness the ke'eke'e of the sun, poho #4 and #5, was incredible due to the fact that not everybody notices that the atmospheric bodies form ke'e. The only two ways I believe there are to see the ke'e of the sun is to actually see it happening with the naked eye or by observing the shadows that are produced by the sunrays against a given object. (The latter process is the one that was used by 'Aikāne 'Alapa'i to study the pōhaku Kāneloa.)



2. The measurements taken above are specific for that day therefore, it acts as a fingerprint or a guide on that particular day. As the sun takes a different course everyday the shadows are sure to shift more drastically eventually reaching other poho and establishing another set that follow another particular time. Like a fingerprint, each day out of the year becomes unique with the shadows it produces.

The sunrises are measured the same as the sunsets and in many ways the sunrises are measured more accurately because of the alignment of the pohos or cupped indentions. The measurements with some sort of uprights were calculated with the same accuracy as our measurement of Mokumanamana, Pi'ilani and Ke'ekū heiau. The difference is that the intense focus of Kanaloa Kaho'olawe is on the sun itself in the pohos without the need to accurately place the east or north walls in alignment with the sun as does a heiau.

23MAR2012
MUKU – ENDING OF PIKO O WAKEA
(KANELOA)



The RECONYX camera was placed at the site from 20MAR12 – 30MAR12.

Pokaneloa Notes

Saturday 06-22-2011

Recorder/PKO: Katie Kamelamela

Edith Kanakaole Foundation: Pua Kanahahele, Huihui Kanahahele, Kuulei Kanahahele, Kekuhi Kanahahele, Kalei Nuuhiwa, Baby Luka Kanahahele

KIRC: Commissioner Baker and Kahale Saito

Immediate Observations by EKF

...

-only for sunrise

-most places have upright alignments

-taught EKF the kee

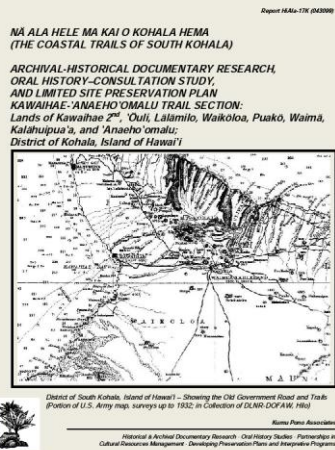
...

-exhaust all possibilities but we are going according to what ancestors say

“It is a difficult thing to try and associate celestial observation functions 400+ years later to sites without the oral history to connect the dots to that particular site.” - Tanya Lee-Greig, Cultural Surveys Hawaii

“At sunrise and sunset during the spring months, a stick held vertically at either end of the lines casts a shadow which generally follows the line. Likewise, a stick held vertically in a few of the cupules does the same. This may be fortuitous since the majority of the cupules are on the south perimeter of the boulder.” –
Lee & Stasack 1993

“exhaust all possibilities but we are going according to what ancestors say “



“Kaneloa is on Kawaihae Hikina, and I know of poho paakai called Kaneloa.” – Kamoehau January 20th, 1876.

Heiau at Kuaokala

There were sun-worshippers among the original arrivals in Hawaii, and there were two temples dedicated to the sun on Oahu, one at **Kaneloa** (a part of the present Kapiolani Park), and one at Kuaokala, Waianae. These temples were not for the whole population, but for only a few who claimed it as a privilege, the rest acknowledging it as such. - **Nakuina, Emma Metcalf 1904**

Mololokai

...Long ago there lived here a group of people who are said to have been very fond of human flesh. At a high altitude on each side of the ridge, guards were stationed to watch for people crossing the narrow stretch of land between the mountains and the sea. On the Makaha side, they watched from a prominent stone known as Pohaku o Kane, on the Keaau side, from a stone known as Pohaku o **Kaneloa**. The individual who passed here was in constant danger of death, for on each side of the trail men lay in wait for the signal of the watcher. If a group of persons approached, too many to be overcome by these cannibalistic peoples, the guards called out to the men hidden below, “Moanakai”; but if, as frequently happened, only two or three people were approaching the watchers called, “Mololokai.” The individuals were then attacked and the bodies taken to two small caves on the sea side of the road, Here the flesh is said to have been removed and the bones, skin, and blood left in the holes, which, at high tide, were washed clean by the sea... - **McAllister Archaeology of Oahu p121**

PREVIOUS ARCHAEOLOGICAL WORK

AUTHOR	DATE	LOCATION	PROJECT TYPE	FINDINGS RELATING TO POKANELOA
Hommon, R.J.	1980	Island wide survey	National Register Nomination Survey	Pokaneloa was not located or documented as part of the National Register Nomination Survey
Lee & Stasack	1993	Island wide survey	Petroglyph study	First documented recording of Pokaneloa. Recorded 2 boulders with petroglyphs.

PREVIOUS ARCHAEOLOGICAL WORK (CONT.)

AUTHOR	DATE	LOCATION	PROJECT TYPE	FINDINGS RELATING TO POKANELOA
Hammatt, et al.	2001	Island wide survey	UXO clearance project	... Pokaneloa was determined a significant historic property...
Uyeoka, et al.	2009	Limited location survey	Archaeological technician training project	Documented Pokaneloa's current conditions to compare to previous conditions.

The Clearance HP Report that includes 110-BU is Task Order 32 (Hammatt et al. 2002)

Falls under Significance category “D” = Important for information content for research potential.

Recommended Treatment was to “Preserve as is” (PAI).

CURRENT THREATS



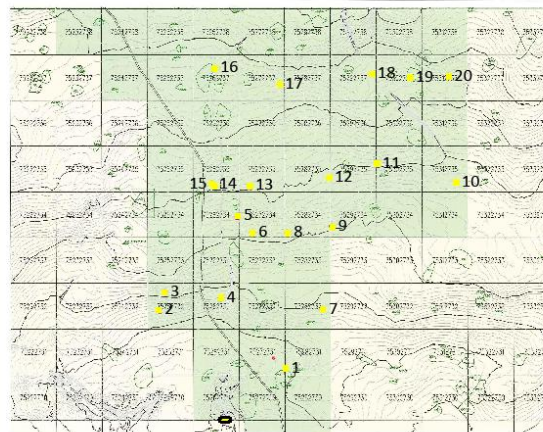
EROSION

EROSION IS INEVITABLE

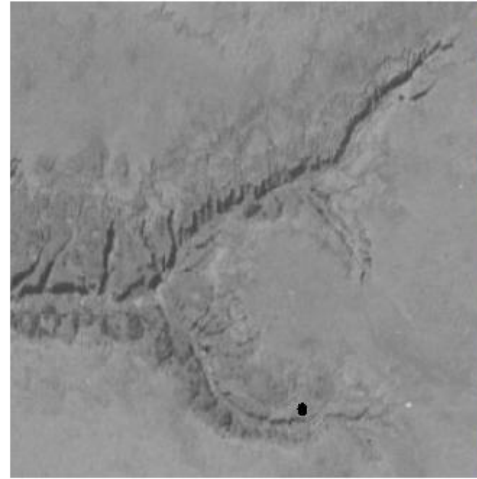
Kaneloa Gulch Erosion Pin data		UTM Zone 4N	
2011	Transect	1 (Short rod)	
	Name	Lyman_GJ	
	Date	8/2/2011	
	Left Monument (mm)	262	Right Monument (mm)
	Level Y/N?	Y	
	Rod 1 (mm)	Rod 2 (mm)	Comments
1	231.5	231	eroded near Lyceon Area Gulch
2	235.5	235	
3	226.0	226	
4	223.5	223	
5	220.0	220	
6	211.0	211	
7	242.0	242	
8	248.0	248	
9	230.5	230	

Holo Num	Height of rod above bar (mm)
1	231.5
2	235.5
3	226.0
4	223.5
5	220.0
6	211.0
7	242.0
8	248.0
9	230.5

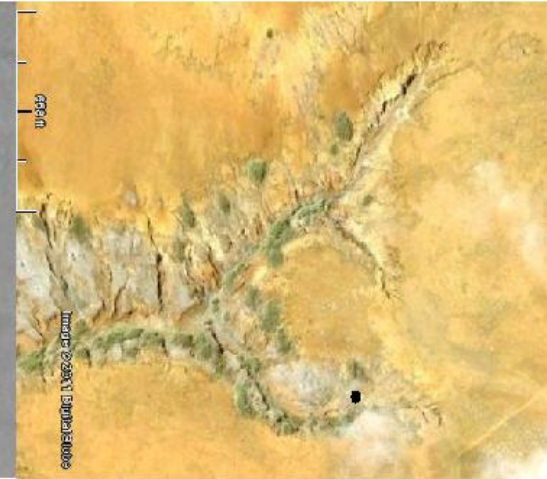
Soil Erosion Pin Transects Kaneloa Stream 2011



1952 vs 2010 Po Kaneloa Stone Erosion
2273002N
752668E



1952

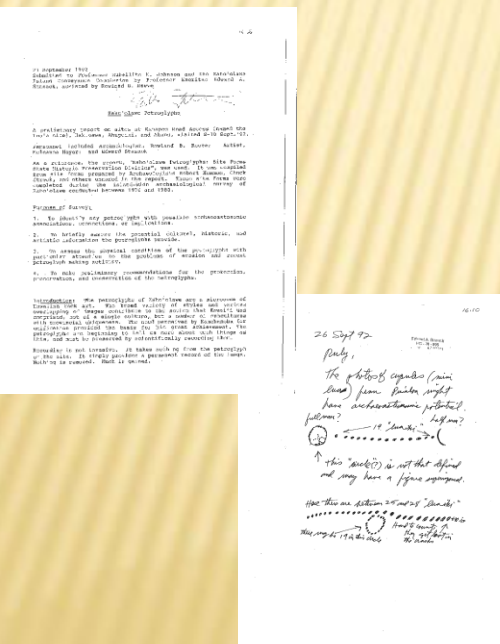


2010

TREATMENT PLAN BACKGROUND

“A boulder found at the Kanapou Road Access... not previously reported or recorded may have an archaeo-astronomic function. It merits further investigation... The cupules on this boulder are very interesting... These could have a relationship to moon cycles or to retrograde planetary movements.” – Stasack, Reeve (unpublished mss. 1992)

“The Loaa stone supports a very special group of petroglyphs which must be preserved. The boulder is balanced somewhat precariously on a pedestal on the edge of a fast-eroding gulch, and is in danger of falling. It may, in fact, have shifted considerably already. Efforts should be made to stabilize this site before it is too late.” – Lee and Stasack (1993)



TREATMENT PLAN BACKGROUND

Assessment of the Loa'a Stone

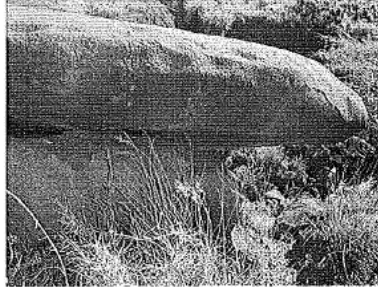
In the early part of March, KIRC staff along with HPQC John Dockall, discovered that the K-2 area near the Kāneloa Gulch had experienced major rain, which caused the Kāneloa Gulch to flood and sustain major erosive damage.

Part of the western ridge that holds site 110 (see attached site information) had washed down into the gulch. The Loa'a Stone, named by Rubellite Johnson, has started to slip down into the gully.

The Loa'a Stone has grinded cuplettes around its edges, petroglyphs, and according to Ms. Johnson, is astronomically placed in certain star lines for navigational purposes. In the KICC report (#21), it states that the cuplettes shapes are similar to other cuplettes found throughout the State, which was known to be used as piko stones.

On March 18, 2003, KIRC staff reassessed the area to determine whether the Loa'a Stone is in eminent danger or if it needs to be moved to higher ground.

Upon reassessment of the Loa'a Stone by KIRC staff, Ka'eo, Tsuha, Higashino and Stepp, a recommendation to relocate the stone in order to save it from being washed down the gully was decided..



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MOVING THE STONE

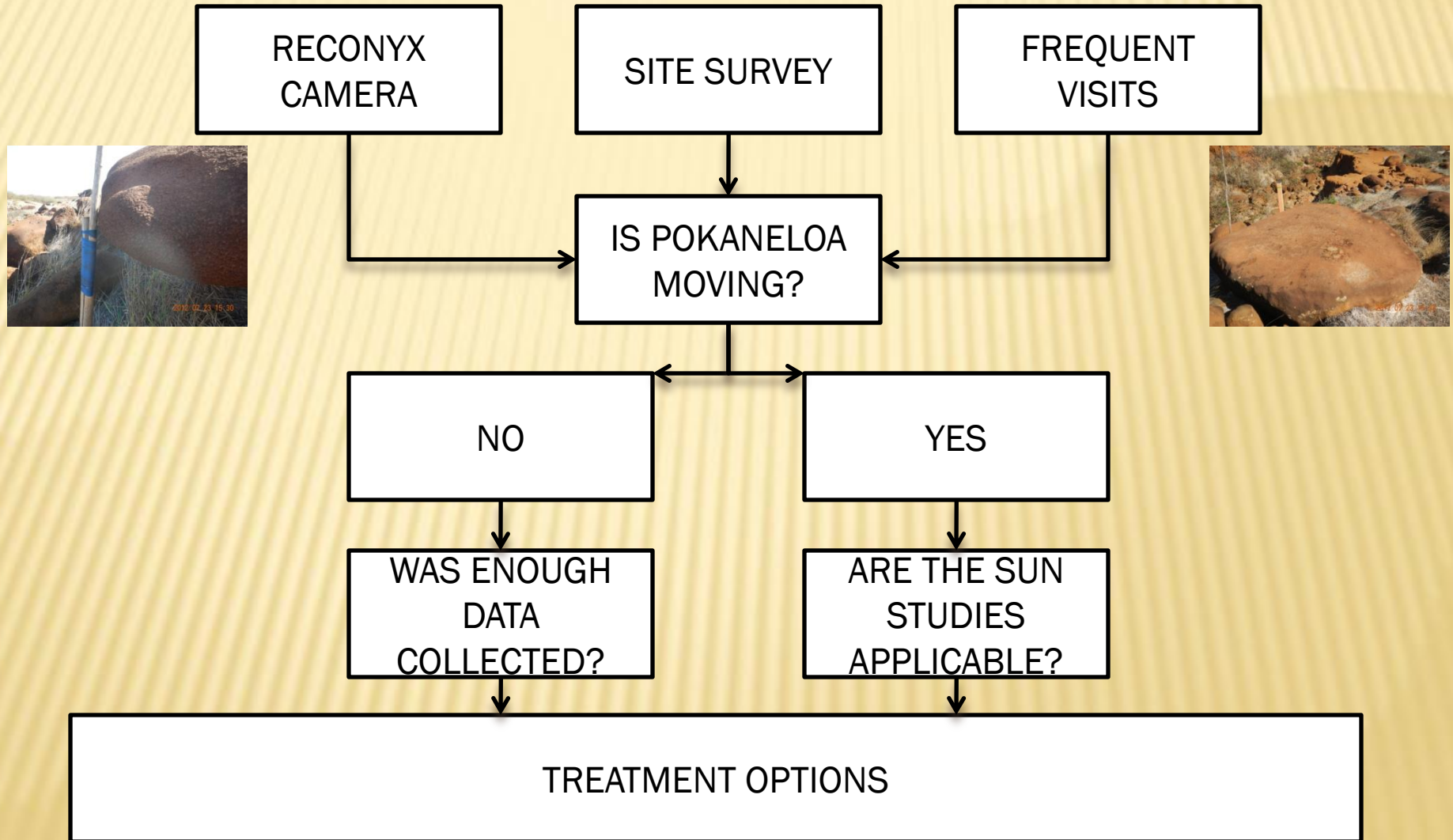
“It was also decided during this training (referring to the Piko o Wakea training) that Pōkaneloa would need to be moved. A site treatment plan needs to be developed. Saito has spoken with Kelly Ueoka from Cultural Surveys. She has agreed to help and has been in contact with Theresa Donham.” - Commission Meeting Minutes October 28, 2010 Page 8 of 12.

“It was observed that Pōkāneloa has shifted significantly and it is recommended that Pōkāneloa be moved in order to stabilize the area and then return it to its present location because the full context of the stone is unknown and we don’t know what would be lost if it was moved permanently.” - (5. Commissioners’ Report on the Piko O Wakea Training September 20-22, 2010) Commission Meeting Minutes November 30, 2010 Page 16 of 17

IS THE STONE MOVING?



SITE OBSERVATION FOR 1 YEAR



TREATMENT OPTIONS

NOTES OF CONSULTATION WITH PROTECT KAHO'OLAWA 'OHANA REGARDING PŌKĀNELOA
POST CLOSING OF MAKAHIKI - FEBRUARY 20, 2011-04-10

Option #1. Let Nature Takes Its Course

Pros

- It would be “natural”

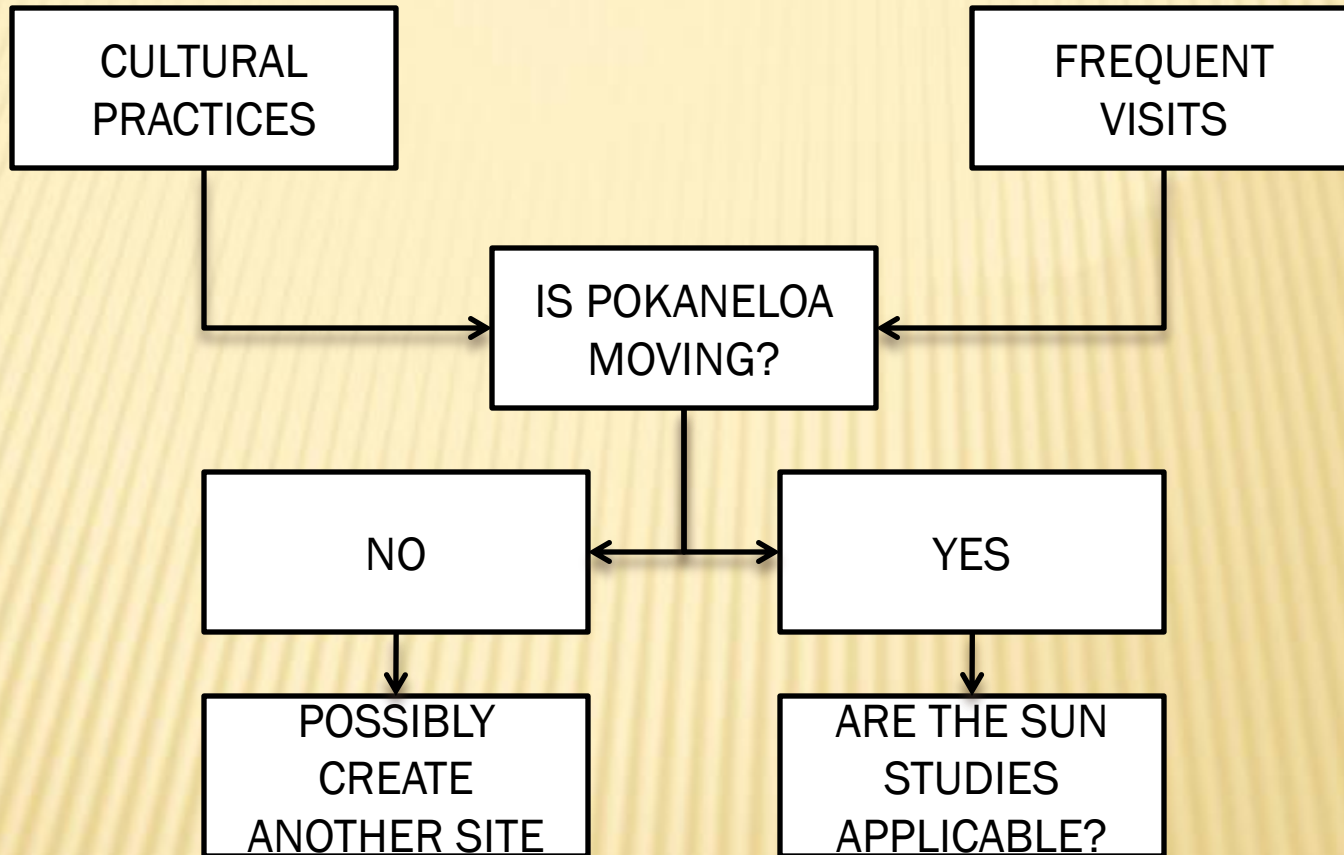
Cons

- The erosion has been promoted by human activity, including bombs, so the processes at work are not really “natural”

Notes

Pualani Kanakaole Kanahele and Edith Kanakaole Foundation
Papakūmakawalu team have observed the changes over the years and feel that it is urgent to save this unique instrument passed on from our ancestors. This is a unique pohaku which could be lost to future generations

LET NATURE TAKE ITS COURSE



TREATMENT OPTIONS

NOTES OF CONSULTATION WITH PROTECT KAHO'OLAWA 'OHANA REGARDING PŌKĀNELOA POST CLOSING OF MAKAHIKI - FEBRUARY 20, 2011-04-10

Option #2. Stabilize it in place with erosion control and re-direction of the water

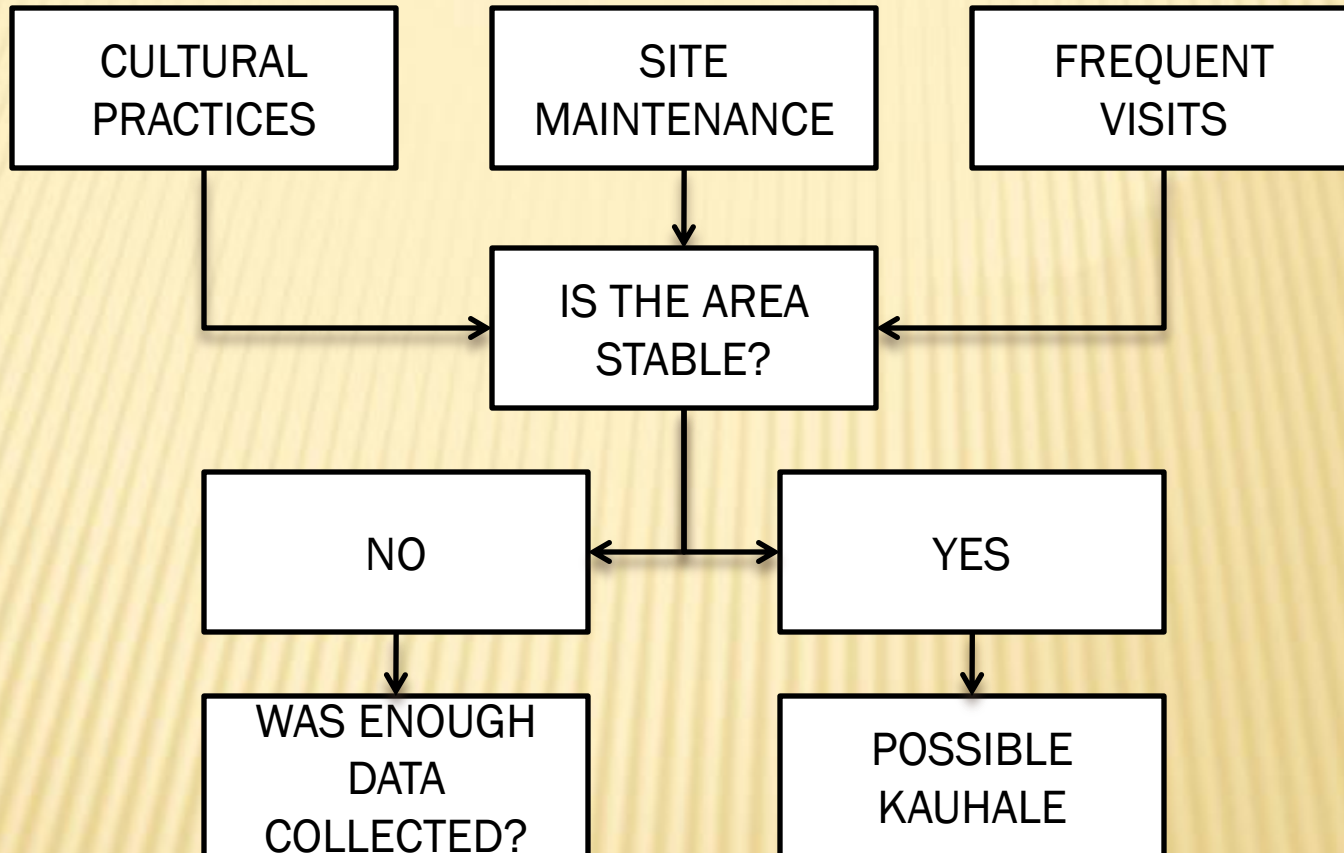
Pros

- Stabilization would involve a lot of people in the community and raise awareness about the site. Broaden the number of people who will experience Kahoolawe
- Preserve that mana put here when placed. Kupuna placed it there for a reason, with a ceremony. Moving it may dislocate this mana.

Cons

- A lot of work for nothing
- A simple strategy, but it involves a lot of cost and work
- A lot of effort and the result may still be the same
- There has been a lot of change over the past 2 years, pointing out the urgency of moving the pohaku.
- The PKO was brought here (on island) by Kalei several years ago. Efforts were made to stabilize the pohaku in place with pili grass. No methodology or strategy for stabilization has been developed.
- Even though the placement will be lost, can still learn a lot from the pohaku
- Stabilizing it will take a long time. A hundred year rainstorm could take the pohaku at one time.

IN PLACE STABILIZATION



TREATMENT OPTIONS

NOTES OF CONSULTATION WITH PROTECT KAHO'OLAWA 'OHANA REGARDING PŌKĀNELOA
POST CLOSING OF MAKAHIKI - FEBRUARY 20, 2011-04-10

**Option #3. Move the pohaku, stabilize the site and bring it back
2 Methods - Move with a helicopter or with a JCB.**

Helicopter

The helicopter would be ideal. Need to come up with an accurate weight for the rock to see if a helicopter could lift the pohaku.

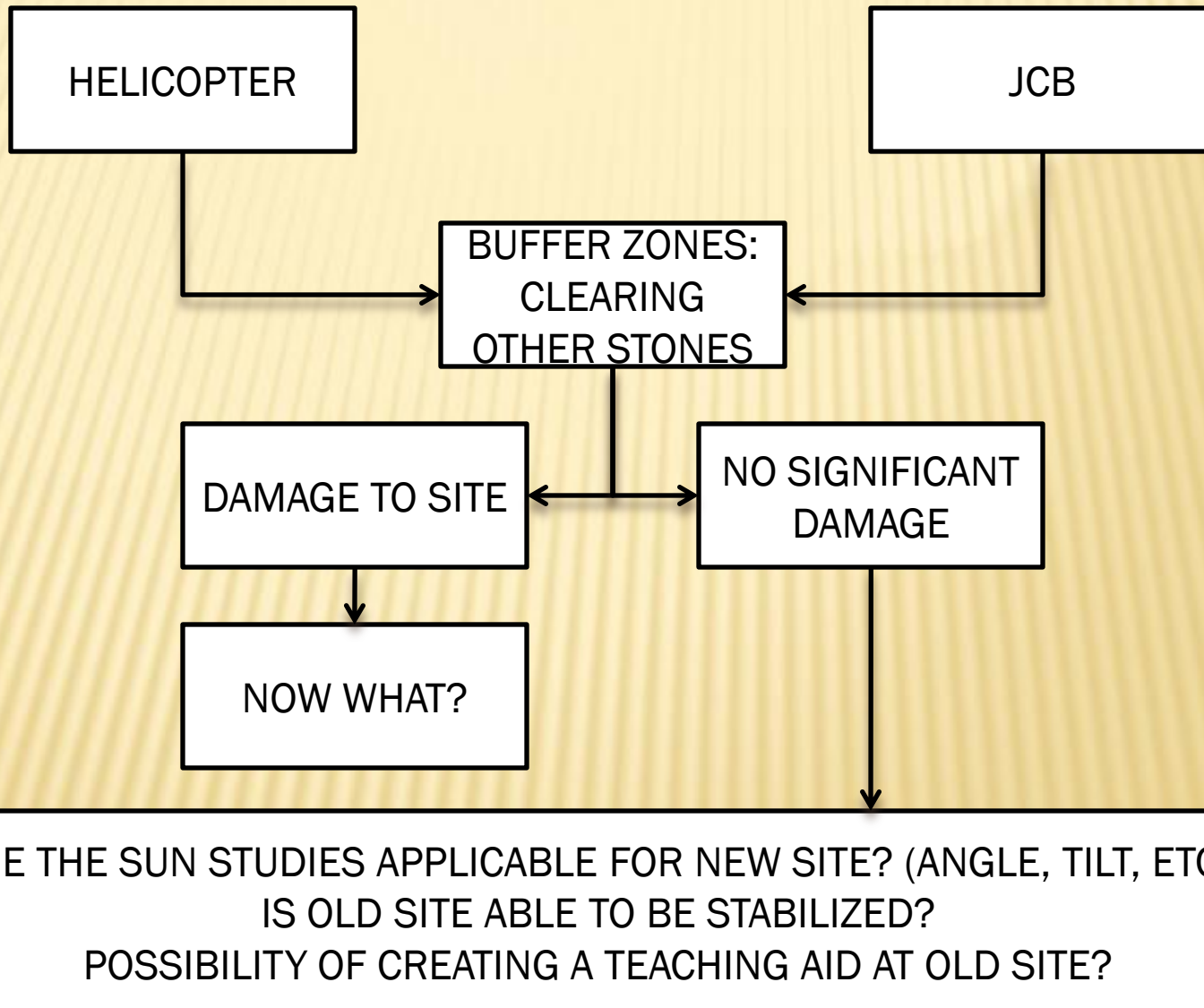
JCB

Would have to move some of the surrounding rocks for the JCB to have a path to get close enough to lift the pohaku

Comparison

The helicopter would have less impact, would be less invasive. Might still need to use the JCB to set the rock. Discussed the possibility of pouring a concrete slab or making an ahu of pohaku at the site where the pōhaku will be relocated. Will need to see the under part of the rock and what is underneath the rock. Would be good to live on the island and to study the site to understand its function.

MOVE, STABILIZE, RETURN



WEIGHT OF THE STONE

weight of pokaneloa stone 3.0 g/cm³ density of basalt

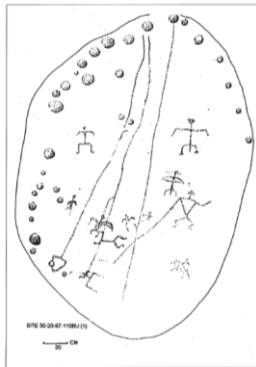
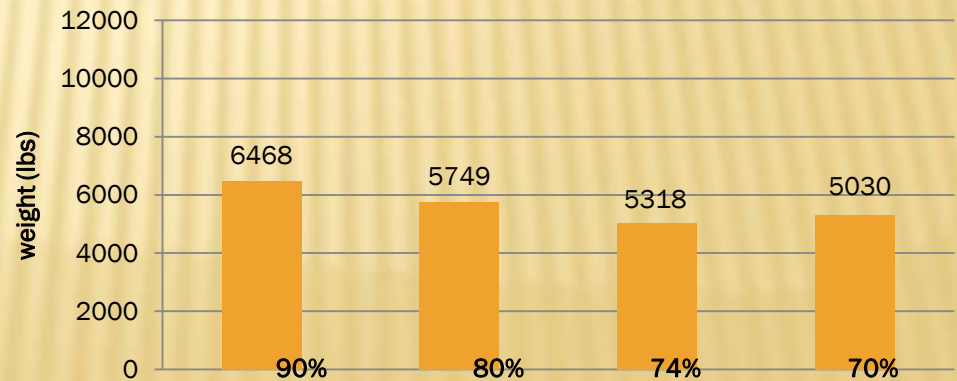
	cm	m
Length	310	3.1
Width	170	1.7
Height	100	1.0

1 Rectangular Volume 5270000 cm³

Conversions		1000 g/kg		2.2 kg/lb		2000 lbs/ton	
		cm ³	weight g	weight kg	weight lbs	weight ton	
2	90%	4743000	14229000	14229	6468	90%	3.2
3	80%	4216000	12648000	12648	5749	80%	2.9
4	70%	3689000	11067000	11067	5030	70%	2.5
5	74%	3899800	11699400	11699.4	5318	74%	2.7

Number of squares in Pokaneloa stone			
	Stone	Space	Total
1	0	1	1
2	0.05	0.95	1
3	0.5	0.5	1
4	0.9	0.1	1
5	0.6	0.4	1
6	0.05	0.95	1
7	0.05	0.95	1
8	0.6	0.4	1
9	1	0	1
10	1	0	1
11	1	0	1
12	0.4	0.6	1
13	0.4	0.6	1
14	1	0	1
15	1	0	1
16	1	0	1
17	1	0	1
18	0.75	0.25	1
19	0.8	0.2	1
20	1	0	1
21	1	0	1
22	1	0	1
23	1	0	1
24	0.95	0.05	1
25	0.9	0.1	1
26	1	0	1
27	1	0	1
28	1	0	1
29	1	0	1
30	0.95	0.05	1
31	0.95	0.05	1
32	1	0	1
33	1	0	1
34	1	0	1
35	1	0	1
36	0.85	0.15	1
37	0.9	0.1	1
38	1	0	1
39	1	0	1
40	1	0	1
41	1	0	1
42	0.6	0.4	1
43	0.5	0.5	1
44	1	0	1
45	1	0	1
46	1	0	1
47	1	0	1
48	0.3	0.7	1
49	0.05	0.95	1
50	0.8	0.2	1
51	1	0	1
52	1	0	1
53	0.9	0.1	1
54	0.1	0.9	1
55	0	1	1
56	0.1	0.9	1
57	0.7	0.3	1
58	0.9	0.1	1
59	0.3	0.7	1

Weight of Pokaneloa Stone



OPTIONS 2 & 3

FORM OF PRESERVATION	BUFFER ZONES	SHORT TERM PROTECTION MEASURES	CONSULTATION	LONG TERM PRESERVATION MEASURES
(2) STABILIZE IN PLACE	NONE NEEDED	NONE NEEDED	CONSULT WITH COMMUNITY FOR OTHER OPTIONS <i>OR</i> FINALIZE METHOD FOR COMMUNITY INPUT	MAINTENANCE CULTURAL PRACTICES
(3) HELICOPTER	TBD ON SITE	FENCING MARKERS CLEARING OTHER STONES	CONSULT WITH COMMUNITY FOR OTHER OPTIONS <i>OR</i> FINALIZE METHOD FOR COMMUNITY INPUT	CONSTANT DATA GATHERING TO ENSURE PROPER RETURN
(3) JCB	TBD ON SITE	CLEARING OTHER STONES	CONSULT WITH COMMUNITY FOR OTHER OPTIONS <i>OR</i> FINALIZE METHOD FOR COMMUNITY INPUT	CONSTANT DATA GATHERING TO ENSURE PROPER RETURN

ESSENTIAL QUESTION

