

AD \_\_\_\_\_

Award Number: DAMD17-00-2-0020

TITLE: Tarague Interpretive Trail Mitigation Plan

PRINCIPAL INVESTIGATOR: David Welch

CONTRACTING ORGANIZATION: International Archaeological Research  
Honolulu, Hawaii 96826

REPORT DATE: February 2001

TYPE OF REPORT: Final

PREPARED FOR: U.S. Army Medical Research and Materiel Command  
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for Public Release;  
Distribution Unlimited

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.

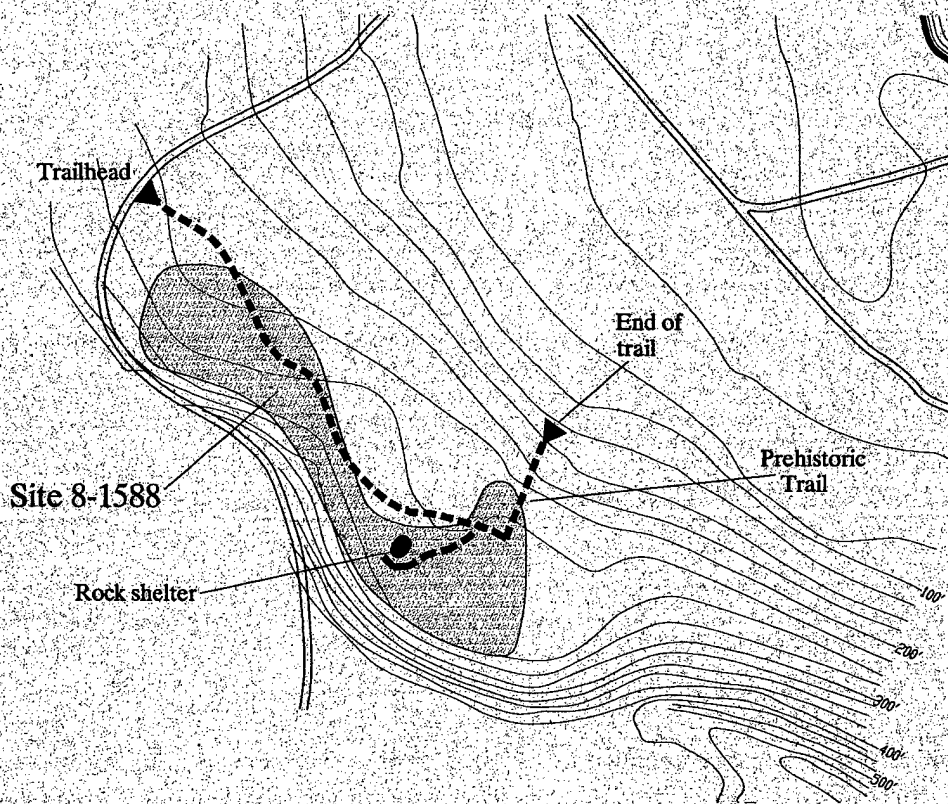
**20010724 034**

**REPORT DOCUMENTATION PAGE***Form Approved*  
*OMB No. 074-0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503

<b>1. AGENCY USE ONLY (Leave blank)</b>		<b>2. REPORT DATE</b> February 2001	<b>3. REPORT TYPE AND DATES COVERED</b> Final (1 Mar 00 - 28 Feb 01)	
<b>4. TITLE AND SUBTITLE</b> Tarague Interpretive Trail Mitigation Plan			<b>5. FUNDING NUMBERS</b> DAMD17-00-2-0020	
<b>6. AUTHOR(S)</b> David Welch				
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> International Archaeological Research Honolulu, Hawaii 96826			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012			<b>10. SPONSORING / MONITORING AGENCY REPORT NUMBER</b>	
<b>11. SUPPLEMENTARY NOTES</b>				
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for Public Release; Distribution Unlimited			<b>12b. DISTRIBUTION CODE</b>	
<b>13. ABSTRACT (Maximum 200 Words)</b>				
<b>14. SUBJECT TERMS</b>			<b>15. NUMBER OF PAGES</b> 13	
			<b>16. PRICE CODE</b>	
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified		<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified	<b>20. LIMITATION OF ABSTRACT</b> Unlimited

**MITIGATION PLAN FOR  
AN INTERPRETIVE TRAIL AT TARAGUE EMBAYMENT,  
ANDERSEN AIR FORCE BASE, GUAM**



Prepared for  
Andersen Air Force Base  
36 CES/CEVN, Unit 14007  
APO, AP 96543-4007

by  
M.J. Tomonari-Tuggle

## INTRODUCTION

At the request of the Chief, Cultural and Historic Resources, 36 CES/CEVN, Unit 14007 at Andersen Air Force Base (AAFB), International Archaeological Research Institute, Inc. (IARII) has prepared a mitigation plan for development of an interpretive trail at Tarague Beach, located on the north coast of the island of Guam (Fig. 1).

The interpretive trail that is the subject of this document is located in the center of the embayment and is the inland leg of a trail called "The Journey through Tarague's Past," the design of which is outlined in Volume IV of *The Legacy of Tarague Embayment and Its Inhabitants, Andersen AFB, Guam* (Tomonari-Tuggle and Olmo 1996:107; 153-161). The trail begins at the Tarague Beach Road and extends southeast along an existing jeep road that parallels the base of the inland cliff (Fig. 2). It passes through prehistoric agricultural features and a rock shelter on the upper Tarague terrace, and then turns seaward along a prehistoric trail that crosses a zone of *karrenfelds* (a geological formation that is colloquially called "pit and pinnacles") and an area of pristine native forest. The trail ends in a coconut forest remaining from the days of copra plantations. A sign at the end of the 1.0 mile trail will instruct visitors to return along the same path.

The purpose of this mitigation plan is to address potential impacts to significant cultural resources from the development and use of the interpretive trail. The plan is sponsored by the Department of the Army as Award No. DAMD17-00-2-0026. The U.S. Army Medical Research Acquisition Activity, 820 Chandler Street, Fort Detrick, MD 21702-5014 is the awarding and administering acquisition office. The information content of this plan does not necessarily reflect the position or the policy of the Government, and no official endorsement is implied.

## BACKGROUND OF THE PLAN

Under the auspices of the Department of Defense Legacy Resource Management Program, IARII, acting as sub-consultants to International Archaeology, Inc., coordinated archaeological, botanical, and geological investigations at Tarague Beach in 1995 and 1996. An interpretive program, outlined in the above referenced document (Tomonari-Tuggle and Olmo 1996), was developed from the resource data. This program includes recommendations for interpretive nature trails, interpretive signage, displays, and public programs that are intended to "promote public awareness, understanding, and appreciation of the unique natural and cultural resources" of the Tarague embayment (Liston, in Tomonari-Tuggle and Olmo 1996:vi).

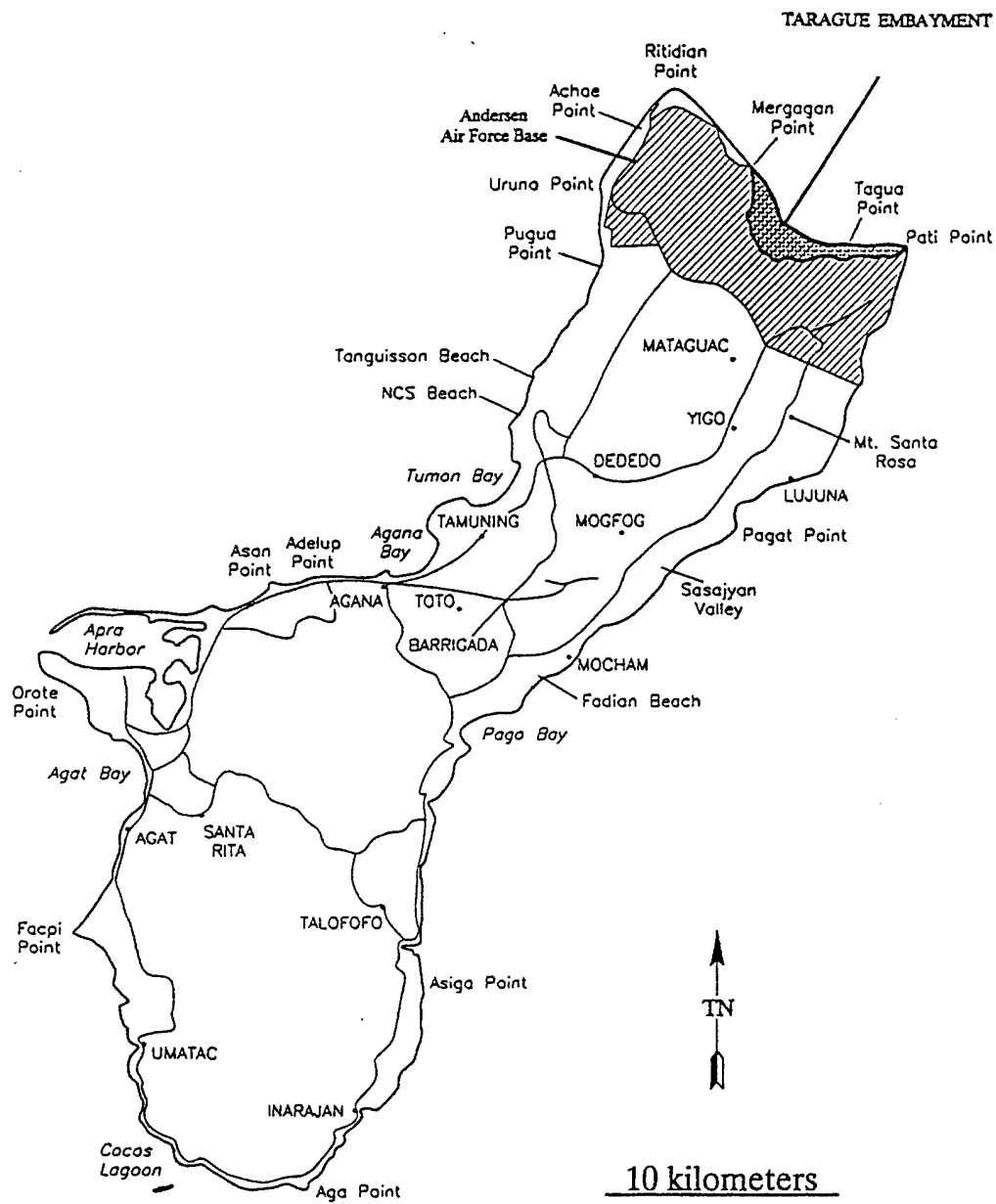


Figure 1. The Tarague embayment on the north coast of Guam.

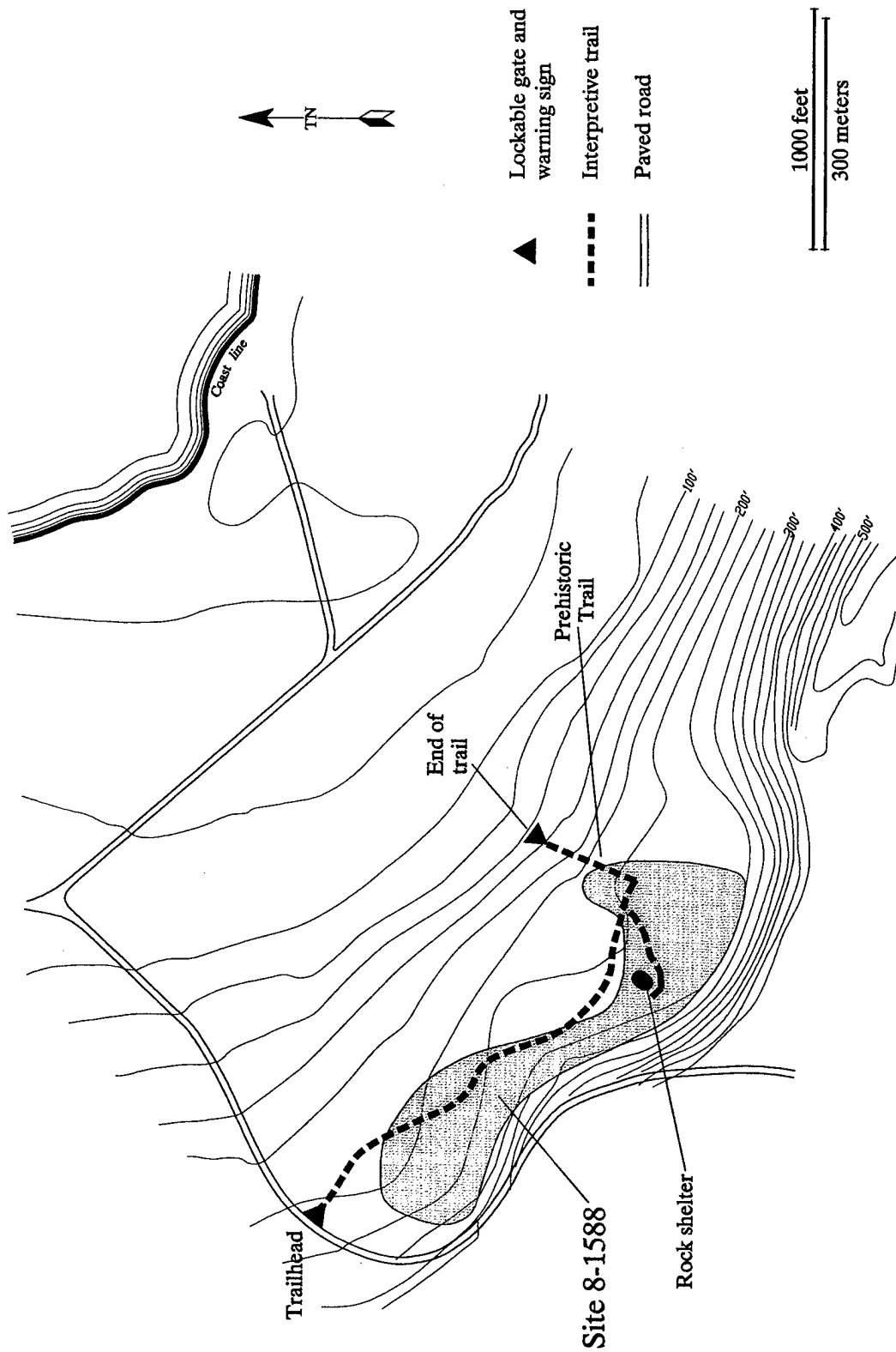


Figure 2. The inland leg of the "Journey through Tarague's Past" interpretive trail.

In September 1998, the 36 CES/CEV prepared an environmental assessment of the Tarague Interpretive Project, based on the results and recommendations of the Legacy project. In a letter dated November 9, 1998, the Guam Historic Preservation Office (GHPO) raised concerns about aspects of the proposed interpretive program; a subsequent review by the Advisory Council on Historic Preservation (ACHP) in a letter dated April 9, 1999 raised similar issues. These concerns are as follows:

1. Arizona Room. The planned interpretive trail will pass a habitation shelter (called the Arizona Room) in Site 8-1588. The shelter is in a rock outcrop near the base of the inland limestone cliff. The GHPO is concerned that unsupervised public access to this site will increase the risk of damage from incidental as well as intentional adverse impacts. The GHPO suggests deleting the site from the interpretive trail or developing it with only supervised trail access. In a follow-up letter to the ACHP from the Chief, 36 CES/CEV, a proposal was made to lay a chainlink fence and 6 inches of soil over the surface of the rock shelter to protect it from pothunting; a monthly monitoring check and signs warning of penalties were also proposed. The ACHP responded that the GHPO should review and comment on the proposal for the chainlink fence/soil protection.
2. Alteration of Rock Alignments. Development of the interpretive trail will require stabilization and possible reconstruction of sections of a prehistoric trail that crosses the *karrenfelds* separating the beach and upper terraces. The GHPO suggests leaving the rock alignments in place and constructing a new interpretive trail nearby, or deleting the prehistoric trail from the interpretive plan, "especially that part of it which would provide unsupervised access to the very highly significant Arizona Room site." The Chief, 36 CES/CEV proposed to the ACHP that a photographic record of the trail will be made. The ACHP responded that the reconstruction of the trail could adversely affect it, but noted that the photographic record should meet curatorial standards.
3. Monitoring for Impacts. The GHPO suggests a need for systematic planning and inclusion of monitoring procedures in the interpretive development, "as well as some indication of responses that will be available if and when such monitoring finds effects to be occurring."

On March 23, 2000, Matthew Rochon (Andersen AFB), Victor Torres (GHPO), and Boyd Dixon (IARII) made an on-site visit to discuss potential impacts and possible mitigation remedies. The results of this field check have been incorporated into this mitigation plan.

## **POTENTIAL IMPACTS ON SIGNIFICANT SITES ALONG THE INTERPRETIVE TRAIL**

Visitor access to archaeological sites along the proposed interpretive trail will increase the potential for adverse impacts to these resources. Primary direct impacts include intentional vandalism, pothunting, and inadvertent or unintentional damage to sites. Subsidiary impacts include littering, unintentional damage from normal use, and erosion problems from excessive wear on the trail surface.

The public education aspect of the interpretive trail, however, will counter some of the impacts. As noted in the Tarague management and interpretive report (Tomonari-Tuggle and Olmo 1996:88), interpretation is a means to encourage trail users to become stewards of the resources:

Public education through the interpretation of selected archaeological, geological, and botanical resources can help to achieve effective conservation. It is highly likely that individuals who come to Tarague are unaware of the presence and significance of the valuable resources of the embayment. Through education, they can become responsible for their actions and impacts on the resources and thus are empowered to take on a stewardship role.

The management and interpretive report (Tomonari-Tuggle and Olmo 1996:88) also notes that "public education is balanced with protective measures such as physical barriers and warning signs, monitoring by conservation officers on a regular basis, and the careful selection of sites and resources that will be interpreted."

## **MITIGATION MEASURES**

### **SECURITY AND WARNING SIGNS**

A sign-in sheet will be located at either Oscars on Tarague Beach, the Base Conservation Office, or at the Law Enforcement Desk. A brochure describing the self-guided hike will be given upon sign-in. Sign-in will be required before every visit to the trail for security, safety, and so that usage can be monitored. A warning sign will be placed at the Seaward Leg entrance to this leg of the "Journey through Tarague's Past" trail; this location will also be the site of the introductory interpretive sign for the trail. A lockable gate will be placed at the trailhead of the Inward Leg of the interpretive trail. A warning sign will also be placed at the Arizona Room. The warning sign will state:

**HELP US TO PROTECT OUR VALUABLE CULTURAL HERITAGE.**

Under the Archaeological Resource Protection Act (ARPA), it is a felony offense to excavate, remove, damage, or otherwise alter or deface an archaeological site on federal lands; it is also a felony offense to sell, purchase, exchange, transport, receive, or offer to sell, purchase, or exchange any archaeological resource that was excavated or removed from federal lands.

All locations for gate and sign placement will be selected by a professional archaeological consultant.

### **PROTECTIVE BARRIERS**

Based on the March 23 on-site visit, the proposal to place chainlink fencing and a 6 inch thick soil overlayer across the interior surface of the rock shelter will be considered following a one month review period after the trail has been opened.

### **MONITORING DURING TRAIL DEVELOPMENT**

A professional archaeological consultant will be present during all ground-disturbing aspects of trail development, including but not limited to:

1. clearing of the interpretive trail alignment
2. stabilization and reconstruction of segments of the prehistoric trail that will be used for interpretation
3. installation of the lockable cable gate and warning sign at the trailhead
4. installation of all interpretive signs
5. installation of all protective measures at the Arizona Room site that may be required following further analysis.

Prior to opening the trail to the general public, a photographic record of selected portions of the prehistoric trail and of all archaeological and significant geological features along the trail will be compiled by a professional archaeological consultant to serve as a baseline for future monitoring of visitor impact. The consultant will determine the appropriate locations on the trail where baseline photographs will be taken. Photographs of archaeological sites will be to curatorial standards.

### **ON-GOING MONITORING AND MAINTENANCE**

A program of systematic monitoring checks will ensure that site protection measures are effective. Initially, monitoring will be carried out twice a month for a period of six months, after which the frequency of checks will be adjusted based on review and evaluation (see below). Monitoring checks will review conditions of the trail and of sites along the trail to determine if there have been adverse impacts from public access. A monitoring form such as that illustrated on the following page will be filled out during each monitoring check.

# Tarague Beach Archaeological Resources MONITORING FORM

**Area Monitored:** \_\_\_\_\_ Interpretive Trail  
 \_\_\_\_\_ Prehistoric Trail  
 \_\_\_\_\_ Site 8-1588 (Arizona Room)  
 \_\_\_\_\_ Other Archaeological Site (specify \_\_\_\_\_)  
 \_\_\_\_\_ Natural Resource (specify \_\_\_\_\_)

**CONDITION OF TRAIL/SITE:** \_\_\_\_\_ Undamaged/unaltered  
 (RELATIVE TO BASELINE) \_\_\_\_\_ Partially damaged/alterd  
 \_\_\_\_\_ Completely damaged/alterd

BASELINE CONDITION OF TRAIL/SITE ESTABLISHED BY:

\_\_\_\_\_ Last visit (date \_\_\_\_\_ by name \_\_\_\_\_)  
 \_\_\_\_\_ Photograph (date of last photograph \_\_\_\_\_)  
 \_\_\_\_\_ 1995-1996 Legacy Survey  
 \_\_\_\_\_ Other \_\_\_\_\_

**NATURE OF DAMAGE/ALTERATION:**

EVIDENCE

PROBABLE CAUSE

_____ increased erosion	_____ vandalism
_____ native plants dug up	_____ pothunting
_____ geological resource defaced	_____ unintentional visitor use/access
_____ unauthorized digging/ subsurface disturbance	_____ natural
_____ surface disturbance (e.g., on trail curbstones, rocks in site moved)	_____ other _____
_____ graffiti (e.g., spray paint, scratches on rocks)	
_____ missing artifacts	
_____ litter	
_____ other _____	

**DESCRIPTION OF DAMAGE/ALTERATION:**

**PHOTOGRAPHS:**

NAME OF MONITOR: \_\_\_\_\_ DATE OF MONITORING: \_\_\_\_\_

During the twice-monthly checks, photographs will be made at Site 8-1588 (Arizona Room) and at the baseline photo locations along the prehistoric trail. The purpose of these photographs is to document the effectiveness of the above described protective measures. Photographs of other locations will be taken only if site damage is identified.

Responsibility for monitoring checks and photo documentation will be assigned to the AAFB Conservation Officer. In addition, the Jungle Enforcement Team (consisting of AAFB Security Forces) will patrol the interpretive trail and access road (Tarague Hill) on a weekly basis. All personnel responsible for monitoring and patrol will be instructed by the AAFB Commanding Officer and the Chief, Cultural and Historic Resources, 36 CES/CEVN on proper inspection procedures and for all other requirements of the mitigation plan.

Maintenance of the trail will be incorporated into the schedule for overall maintenance at Tarague Beach. Maintenance will include trash collection and clean-up of litter and signs of vandalism.

#### REVIEW AND EVALUATION

If any site damage is discovered during the monitoring checks and/or the Jungle Enforcement Team patrols, the mitigation plan provisions will be reviewed and, if necessary, revised by 36 CES/CEVN staff assisted by its professional archaeological consultant.

If no site damage is discovered during the six month initial evaluation period (after the trail has been opened to the public), a general review and evaluation of the interpretive trail will be made following the six month period. This review and evaluation will cover:

1. trail conditions
2. site conditions
3. monitoring schedule and personnel
4. maintenance schedule and personnel
5. need for changes in the management actions
6. designation of next review and evaluation period.

Review and evaluation will be based on information on the monitoring forms, interviews with the designated monitor, and Jungle Enforcement Team reports. This review will be carried out by 36 CES/CEVN staff, assisted by its professional archaeological consultant if the trail has significantly deviated from its baseline condition.

A report of this initial review and evaluation will be provided to the GHPO.

### COMMUNITY PARTICIPATION

An AAFB community group, such as the Boy Scouts or Girl Scouts, will be solicited to adopt this trail. Under the guidance of a 36 CES/CEVN staff person, the group will assist in the trail's development and maintenance, and will assume a stewardship role. They will assist in monitoring trail conditions, carrying out community-based evaluation of the interpretive aspects of the trail, and ensuring that long-term maintenance on the trail is continued.

## REFERENCES

Tomonari-Tuggle, M.J. and R.K. Olmo

- 1996 *Theoretical Perspectives and the Stewardship of Cultural Resources. Volume IV, The Legacy of Tarague Embayment and Its Inhabitants, Andersen AFB, Guam.* Prepared for Andersen Air Force Base. International Archaeology, Inc., Honolulu.